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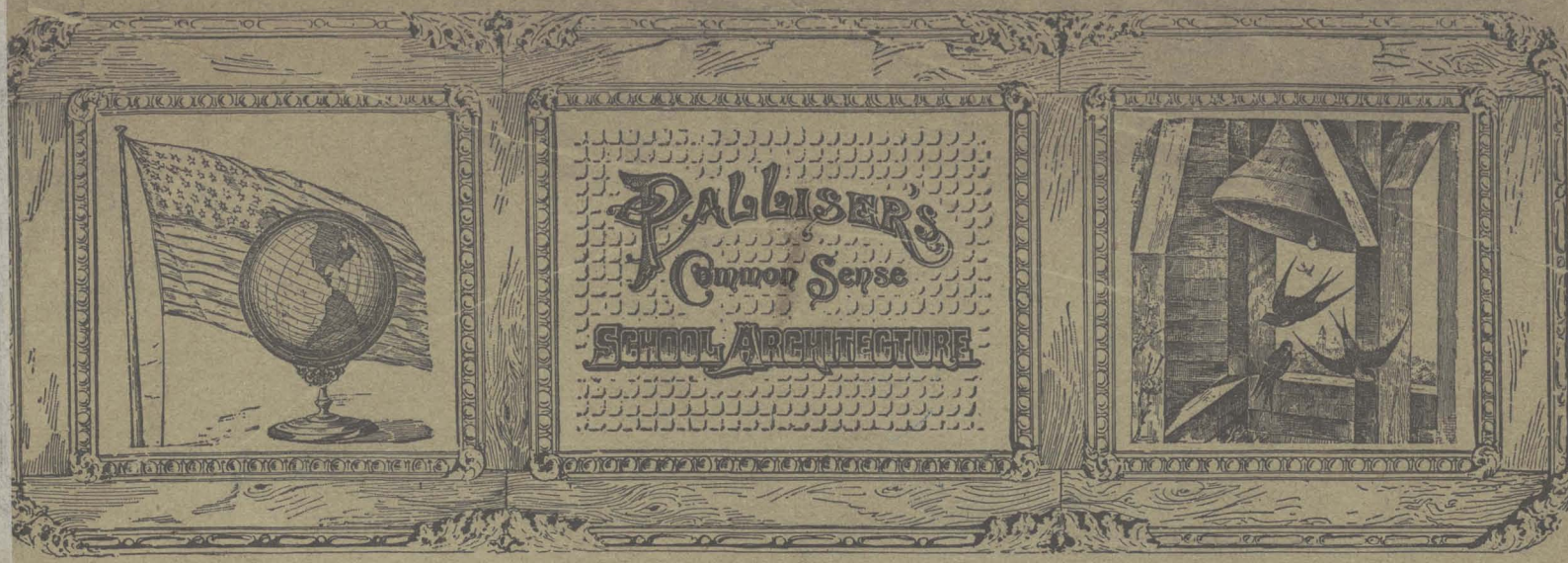

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PROSPECTUS AND ANNOUNCEMENT.

PALLISER'S AMERICAN ARCHITECTURE; or, EVERY MAN A COMPLETE BUILDER, the first number issued of this series, and which was brought out in April, 1889, has already met with such an unparalleled success that we have, at the request of many friends and well-wishers, determined to broaden its field of usefulness, and shall take up and illustrate matter that has never been gone into heretofore; and while we recognize the fact that there are already a large number of Architectural and Building Journals in the field, and in fact an immense amount of ordinary sketchy matter published weekly and monthly, yet, at the same time, we find that what is actually wanted by the building public, viz., practical work, is not to be had, and in the belief that we can furnish the needful, we have undertaken this publication, and, judging from the reception given its first number, it is to be an immense success, and we shall certainly spare neither pains nor expense to make it so.

It will be issued quarterly, and each number will contain more matter than has ever been offered before in a complete volume at the price of subscription for a year, which is only $3.00 in advance, or $1.75 for six months.

Persons sending $1.00 for a sample copy may have their names put on the subscription list for the balance of the year by sending $2.00 within 30 days from receipt of the first copy.

With the issue of this number, Volume I. is completed, and the entire first volume of PALLISER'S AMERICAN ARCHITECTURE—THE BUILDER SERIES, consisting of four numbers, three single and one double number with supplement, elegantly bound in one volume, cloth, will be sent to any address by Express, prepaid, on receipt of price, $4.00.

The first volume of PALLISER'S AMERICAN ARCHITECTURE having proved a grand success, we are determined to make the four quarterly numbers of Volume II. still more popular and interesting, and therefore shall look for a large increase in the number of subscribers.

No. 1, Volume II., will be designs for Memorials and Headstones of moderate cost (400 designs), together with over 700 Mottoes for Monuments, and to be followed up by No. 2, which will be a complete number on building homes, entitled "PALLISER'S MODEL DWELLINGS FOR INDUSTRIAL AMERICANS," or, Homes for Co-operative Builders, Investors and everybody desiring to build, own or live in Model Houses of low cost, 140 designs; No. 3 will be devoted to Mercantile Architecture, and No. 4 to Brick Houses for cities and towns. No pains will be spared to make each number and volume both attractive and valuable to all engaged in Building and kindred pursuits, and the

PALLISER'S

Common Sense School Architecture

Illustrating the Practical and Economical Warming and Ventilation
and the Correct Planning, Arrangement and Sanitary Construction of School Buildings for American Cities, Towns and Villages,

BY

PALLISER, PALLISER & CO., ARCHITECTS,

Who have Achieved Distinction in Designing Buildings for School Purposes,
both in the United States and elsewhere.

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"Palliser's New Cottage Homes and Details."
"Palliser's Building Specifications and Contract Blanks," etc., etc.

NEW YORK:
J. S. OGILVIE, PUBLISHER,
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FULL LIST OF ILLUSTRATIONS CONTAINED IN THIS WORK

TOGETHER WITH PARTICULARS OF SAME.

Frontispiece.—Three Log School Houses, fully illustrated by plans, elevations, perspective views and details.

Page 4.—Perspective View of Design for High School, Stratford, Ontario. This building contains ten school rooms and an assembly room. Cost, $25,000.

Page 7.—Plans, elevations, sections and perspective view illustrating the successful competitive design submitted in competition at Cleveland, Ohio, for a building to accommodate 1,000 scholars on two floors, 24 architects competed and nearly every one of them proved their entire lack of that knowledge necessary in the practical arrangement and construction of a modern school building of this class. Cost, $50,000. Plates 1 to 3.

Page 10.—Specifications, plans and detail drawings of the Fowler School Building, erected at Cleveland, Ohio, cost $58,223.75. Plans, elevations and sections are from working drawings all completely figured, and the details are reproduced from full size and 1½-inch scale drawings. Plates 4 to 25.

Page 37.—A compact 2-story 8-room School, arranged for a future addition of 8 rooms, cost $9,500. Plate 26.

Page 38.—Full specifications, plans, sections, elevations and perspective view of the Cherry street High School, 12 school rooms, library, principal's room and an assembly room, erected at Elizabeth, N. J., cost $28,273.67. This design was accepted by the School Board over 17 competitors, and the architects, Palliser, Palliser & Co., superintended all its details of construction to its entire completion, and in the execution of same there were no additions or changes made, and not a cent for extras to pay to the contractors at completion. It was said that a disappointed architect residing in the city of Elizabeth tried hard to obtain an injunction to prevent the carrying out of these plans and the substitution of his own plans and services instead. Plates 27 to 31

Page 47.—Three designs for one room Frame Village School Houses, cost $600 each. Plate 32.

Page 49.—Design for a two-room Frame Village School, cost $1,000. Design for a one-room Frame Village School, cost $1,000. Plate 33.

Page 51.—Two designs for two-room Frame Village Schools, cost $1,500. Plate 34.

Page 53.—Design for Frame School, containing two large and two small rooms, the latter for teachers' room, library or recitation rooms, cost $2,500. Plate 35.

Page 56.—Design for Brick and Frame Building having three school rooms and an assembly room, cost $5,000. Plates 36 and 37.

Page 60.—Design for a Brick Building with four school rooms, a large assembly room, library, etc., cost $10,000. Plates 38 and 39.

Page 62.—Design for a four-room Brick School house, cost $7,500. Plate 40.

Page 63.—Design for an eight-room Brick School Building, cost $15,000. Plate 41.

Page 65.—Design for the Connecticut State Normal School Building, New Britain, Conn., illustrated by plans, elevations, sections and perspective view, cost $73,000. Plates 42 to 46.

Page 70.—Alternate for a six-room School House for the Bryant School, Great Barrington, Mass., one design showing stone first story, with shingle second story, and the other entirely of brick, cost respectively $12,000 and $14,000. Plates 47 and 48.

Page 72.—Design for High School, Owego, N. Y., cost $20,000. Plates 49 and 50.

Page 74.—School House at St. Croix Falls, Wis., frame and brick veneered, cost $4,000. Plates 51 and 52.

Page 76.—Plans, elevations, sections, detail drawings, specifications and bill of materials of Brick Village School House and Teachers' Residence for the government of Brazil, of which there were ordered to be erected 360 throughout the country, cost $5,000. Plates 53 to 55.

Page 80.—Plans, elevations and sections of City School House for the government of Brazil, ninety-four of which were ordered erected in the cities of Brazil, cost $15,000. The same building erected at Paintsville, Ky., cost $6,000. This School House, with Basement under (including warming and ventilating, which cost $600), is now being erected at Catalpa, Va., and known as the Catalpa District School House, Culpepper County. Total cost, complete, about $8,200. When it is provided with basement for play rooms and with plumbing, warming, ventilating, etc., its cost varies from $9,000 to $12,000 in the United States, depending on location and cost of materials, labor, etc., etc. Erected in villages of New England, of frame, with basement; its cost has been $5,000 to $6,000. Plates 56 to 58.

Page 83.—Design for a ten-room Brick School House for Worthington, Minn., cost $17,000. Plate 59.

Page 84.—Design for High School Building, Meriden, Conn., cost $30,000. Plates 60 and 61.

Page 86.—Design for Grammar School, Hoboken, N. J., cost $30,000. Plates 62 and 63.

Page 88.—A Frame Village School, cost in Michigan $850, and in California $1,400. (For perspective view see plate 1, top right-hand corner.) Plate 64.

Page 89.—A six-room Brick School House of two stories, cost $8,000. Plate 65.

Page 90.—A Frame Village School, Library and Public Hall, cost $3,500. A Frame Kindergarten School, a suggestion for a philanthropic mind, cost $1,500. Plate 66.

Page 91.—An eight-room Brick School arranged for future additions, cost $9,000. Plate 67.

Page 92.—Design for McKinney (Texas) Collegiate School, cost $10,000, also showing future additions. Plate 68.

Page 93.—Indian School for Missionary Bishop Hare, Dakota, cost $12,000. Plate 69.

Page 94.—The Kent Industrial Home School for Colored Girls, M. E. Church, Greensboro, N. C. The erection of this building was carried out under the direct management of the architects, a clerk of works being sent to Greensboro from the office of Palliser, Palliser & Co. to supervise construction and to employ all labor and purchase all materials at lowest prices for cash, cost $3,800, including pay of the clerk of works and also architects fees. Plate 70.

Page 95.—Design for a Kansas College Building, cost $20,000. Plate 71.

Page 96.—Old House changed into the Glen Tower School for Boys, Dobbs Ferry, N. Y., cost $18,000. Sketches showing further large additions made later. It is used as a hotel during the summer vacation months. Plates 72 and 73.

Page 98.—St. John's Parochial School, erected at Jersey City, N. J., cost $13,657. Plates 74 and 75.

Page 100.—Plans and elevations of Brick Convent Building for the Sisters of our Lady of Mercy, Asheville, N. C., cost $23,000. Plates 76 and 77.

Page 102.—Plans and perspective view of St. Agnes Convent, Bridgeport, Conn., most substantially constructed of stone, finished in hardwoods throughout and handsomely furnished and decorated, cost $40,000. Detail drawings of interior work, fittings and furniture. Plates 78 to 80.

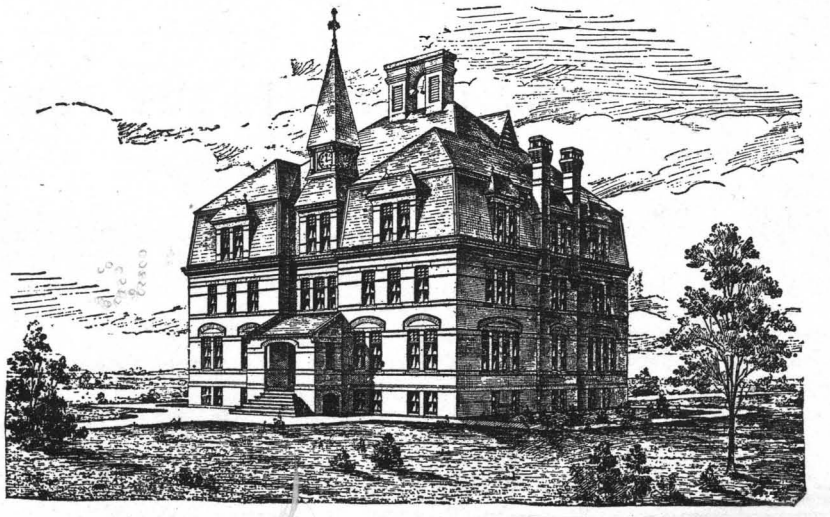
Page 105.—Design for Brick Convent and Church combined, cost $50,000. Plate 81.

Page 106.—Thirty buildings that are American School Houses in the Barnesque, Factory and Nondescript styles. They generally exhibit a want of light and other requisites; and are not models to be followed in these days of improvement. Plate 82.

Page 107.—Plans for a School House recently issued by a person in New York, signing himself "Architect," and published in a building journal. We have seen school-house plans before, made by architects and others who knew nothing about the arrangement and construction of school buildings, but this is the very latest and the very worst of all. Such designs as this should not be built after, but on the contrary ought to be avoided as one would poison. Plate 83.

Page 108.—General perspective view and floor plans of a Kindergarten, combined with a Model High School for Girls, erected at Blackburn, England, by Stone & Gradwell, architects of that town. It is planned on the central hall, or, more descriptively, the hall passage system; it has fire-proof floors and the construction is generally very substantial. The heating is indirect and thorough ventilation is obtained by mechanical means, forcing the air into the building on the "Plenum" method, which can be used in Summer for cooling. Each scholar has a separate seat and desk, and the seats have adjustable backs and foot-rests on Dr. Roth's principle. The exterior walls are faced with fine red bricks, dressings of buff terra cotta; while the roofs are covered with brown red tiles, cost (£12,000 sterling) $60,000. Plates 84 and 85.

Page 110.—Perspective view, together with local newspaper description of a large Village School Building recently erected in what we style the pure carpenterology of ugliness and bad taste, but located in a beautiful village less than fifty miles distant from New York, by a firm of city architects, who it is said were once building contractors, but, failing in this, their legitimate vocation, they did not take up the business of real estate, but to them the apparently easy profession of architecture, and this production shows how well they succeed, while another of their buildings lately collapsed, sending, without a moment's warning, about seventy people into the great unfathomable. The sum of $47,000 was thrown away in putting up this School House, and it stands to-day a blot on the landscape and a menace to the health of the families of New York's business and professional men who attend this school, and are residents of that pretty suburb while to the knowing ones it is a monument to the Board of Education as representing the result of their idiotic and brainless management of such an important matter. The editors of the press instead of ignorantly eulogizing this effort in School Architecture—no doubt they were paid for the space—should have possessed manhood sufficient and common sense enough to attack its shortcomings and condemn it in the severest terms, and not have abated their honest exertion one iota until it had been razed to the ground, and thus won for themselves the commendation of the intelligent people; but then the press is not what it should be, and its managers and editors are often anything but men of character and honor. Plate 86.



PERSPECTIVE VIEW.

DESIGN FOR HIGH SCHOOL, STRATFORD, ONTARIO.

* ESTABLISHED 1877. *

PALLISER, PALLISER & CO., Architects, 24 EAST 42d STREET,

Between Madison and Fifth Avenues, Second Block West of Grand Central Station.

NEW YORK.

Prepare Designs, Drawings and Specifications for Every Description of Buildings for Erection in any part of the World. Also give special attention to the Remodeling of Existing Structures and the designing of

Furniture, and Interior Decorations, also Monuments, Memorials and Headstones.

Consultations and expert testimony on all matters pertaining to Building, Drainage, Sanitary Works, Warming, Ventilation, Machinery, Valuations, Etc., Etc. Building Cases at Law taken charge of and carried to a final issue in the Courts.

We render Special Services in the designing of Public Works, as Churches, Schools, Court Houses, State, County and City Buildings. We can refer to many such erected all over the United States and Canadas; several by the Brazilian Government.

Upwards of Three Thousand public and private buildings erected in all parts of the Western World from Special Plans, etc., to meet the requirements of each case.

If any one wishes to employ us, we shall be pleased to hear from them, and will undertake to serve them in the best, most careful and faithful manner; but it is usually expected that inquiries will be accompanied with stamp for reply. During the past four or five years we answered at considerable cost in time, postage, etc., several thousand letters of inquiry from people everywhere, who omitted to inclose stamp; and, in a great many instances, these inquiries were of little account. We have no desire to be troubled for nothing; though, as a matter of courtesy, we answer all letters promptly, and shall continue to do so.

It matters not whether our clients reside in the States of Connecticut, Massachusetts or New York, near to us, or 3,000 miles away—DISTANCE IS NO OBSTACLE—we can serve them equally as well, as upwards of three thousand of our clients residing in every State and Territory in the Union, Canada, Nova Scotia and the Brazils can testify; and wherever our designs are carried out clients are pleased, press and public extol on the art and conveniences, being the wonder and admiration of every one; and builders everywhere are unanimous in their statements that they are the best that they were ever engaged to execute, and that the drawings, specifications and all the instruments of service are rendered in the most thorough, complete and practical manner for them to work from, and to enable them to put the work together without the slightest error; and every one may certainly rest assured that we shall not, at this stage of our practice, do a service in any manner that will not give the fullest satisfaction. Our study is faithful service for our clients' best interests.

"PALLISER, PALLISER & Co. came to this country some few years ago, and were the first to introduce this modern taste into our domestic architecture, striking at everything in the shape of ugliness and putting forth instead sound and economical construction combined with good taste in design. They are gentlemen who have had a thorough practical training, are able mechanics and constructors, and their artistic ability is seen in everything that comes from their hands; in fact, there is nothing that can compare with it. They have earned a national reputation."—*American Builder.*

"Their beautiful designs mark them as public benefactors, for any man is such who adds to the comfort and beauty of the homes of the nation."—*Chicago Inter-Ocean.*

"In their work they combine consummate art with economy and agreement of estimate with cost."—*The South.*

"These gentlemen are evidently thoroughly practical and accomplished architects, with the comparatively rare gift of common sense."—*Iron Age.*

"Their designs, even for the cheapest dwellings, are tasteful, picturesque and elegant."—*Scientific American.*

"PALLISER, PALLISER & Co. have been successful in many important competitions for every description of public buildings in which they were invited to take part, both in this country and Canada. Among the most recent may be mentioned the Escambia County Court House at Pensacola, Florida, being limited and paid, and the great School House competition, open to the whole country and instituted by the Board of Education of Cleveland, Ohio, with a view to providing healthier and more convenient school houses for their progressive and beautiful city; a premium of $500 being offered in addition to the work of making full plans, details and specifications at regular architect's charges. Twenty-four architects competed under motto, the palm being carried off by Palliser, Palliser & Co.

"Later, at Elizabeth, N. J., the School Board advertised for designs for Model School-House, to accommodate 600 scholars, and also to provide large Assembly Room in which to bring the school together, offering a prize of $150, and the work of making full working plans and superintending the erection of the building at a per cent. on cost of same to the author of the best design. Seventeen New York architects sent in designs, the one by the Messrs. Palliser being adjudged the best and most practical.

"The erection of St. Agnes Convent and Schools, located at Bridgeport, Conn., and dedicated December 22, 1884, by Bishop McMahon, was commenced October, 1873, and has occupied eleven years in construction. It is said that as a building, it is probably unsurpassed in the matter of comfort, elegance, convenience, durability and sanitary improvements. Its foundations are on solid rock, it is built of granite, and will stand for ages as a monument to the practical ability of the Architects, PALLISER, PALLISER & Co., who superintended all its details of execution, and whose designs and services were selected for the work, after a competition in which five invited architects took part."—*Daily Paper.*

"There is probably no architect, or firm of architects, in this country, who have taken part successfully in so large a number of architectural competitions as PALLISER, PALLISER & Co., of this city, whose latest success has been achieved in British Columbia, in presenting the best design for Prison buildings, to be erected by that government, and thus securing the first prize of $500 over all local and foreign competitors. They also recently won the great Court House competition for Knox County, Tennessee, competing with all the leading Southern architects."—*Daily Paper.*

Their success in business may be attributed to the fact that they are thoroughly trained and practical architects, and design the finest buildings and have them erected at the least cost, scrupulously saving every possible dollar.

Thousands of Buildings have been built from PALLISER, PALLISER & Co.'s popular books of plans, details and specifications. In fact, there is not a city, town or village of consequence in the country but what contains from two to twenty buildings so erected.

Messrs. Palliser, Palliser & Co.
Gentlemen:—We like your plans very much.
Yours, etc.,
R. H. Elliston,
Sec'y Board of Education, Williamstown, Ky.

The above is a sample of letters received from School officials having charge the construction of School Houses erected from plans prepared by us.

PALLISER, PALLISER & CO., Architects, 24 East 42d St., New York, are prepared to receive a limited number of suitable young men for a term of three years as students in Practical Architecture. Send Stamp for full particulars, and don't expect that we shall pay $5or $10 a week to have any one in our office and give our time teaching them, furnish office room, tools, paper, etc., gratis.

Address all communications plainly to PALLISER, PALLISER & CO., and to address given above, and when at the office be sure and ask for our Mr. Charles Palliser—personal office hours, 10 A.M. to 2 P.M.

Read what an Experienced Principal reports:

BOARD OF EDUCATION,
OFFICE OF THE
CITY SUPERINTENDENT OF PUBLIC SCHOOLS,
ELIZABETH, N. J.

Messrs. PALLISER, PALLISER & Co.

Gentlemen:—The principal of School No. 4 or High School in Cherry Street, concerning which you inquired in your letter, has reported to me as follows: *I regard the arrangement of this building as most excellently adapted to School purposes. Pupils may be moved in, out and through the building with greater facility than is possible in any other I am familiar with. The warming and ventilation have been to me very satisfactory, while only moderate intelligence is needed to operate the ventilating appliances so as to secure the purest air I have ever breathed in a School Room.* Truly yours,

J. AUG. DIX, City Superintendent.

Read what the U. S. Commissioner of Education says:

W. T. Harris, Commissioner.
J. W. Holcombe, Chief Clerk.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
WASHINGTON, D. C.

PALLISER, PALLISER & Co., Architects,
No. 24 East 42d Street, New York, N. Y.

Gentlemen:—Your letter of the 28th ultimo was duly received during my absence in the West. I am pleased to learn of your proposed publication upon "School-house Architecture" which will doubtless prove a valuable work. Every effort to improve the School houses of the country is deserving of all possible encouragement. I therefore wish you great success with your book.

Very truly yours,

W. T. Harris
Commissioner.

BOARD OF EDUCATION,
PAINTSVILLE, KENTUCKY.

Messrs. PALLISER, PALLISER & Co., 24 East 42d St., New York.

Gents:—So far the work on our School building has been rather slow, on account of wet weather, etc. *"The plan we received from you for School building is a good one and well suited to this country. Everybody that has examined it is well pleased, and it's a wonder how such a house can be built at such low figures* ($6,000)." Yours truly,

E. F. HOWES.

OFFICE OF
SUPERINTENDENT OF INSTRUCTION,
443 Euclid Ave., CLEVELAND, OHIO.

PALLISER, PALLISER & Co., New York City.

Gentlemen:—Your favor in regard to our Fowler School was duly received. Replying, allow me to say that the Building presents a very fine appearance architecturally, and all its features are pleasant. Very truly,

L. W. DAY, Superintendent.

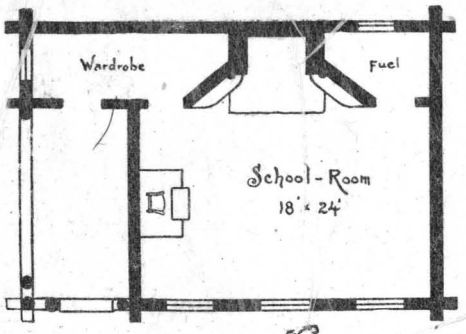
Read the following letter from Salvador de' Mendonca, now Brazilian Minister to the United States Government at Washington.

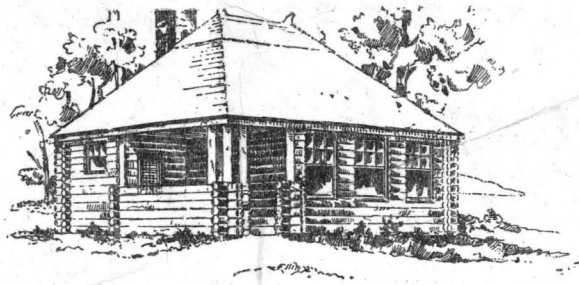
Messrs. PALLISER, PALLISER & Co.
NEW YORK CITY.

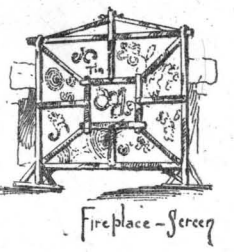
Dear Sirs:—I received in due time your esteemed favor of Jan. 8th, and have been so busy that it has been impossible to answer it before this. I remember very well the excellent work you did for me and friends in Brazil. I have been recommending your office to different parties in this country, and even this morning a gentleman, who desires to build some houses in Bay Ridge, was referred to you. As soon as I have the time, I will call on you, as I intend to build myself a country place.

Believe me always yours respectfully,

SALVADOR DE' MENDONCA,
23 State St., New York. Brazilian Consul General.



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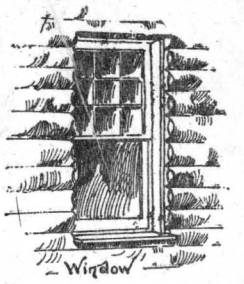
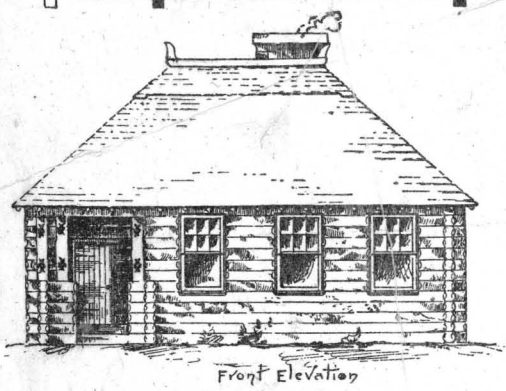

Window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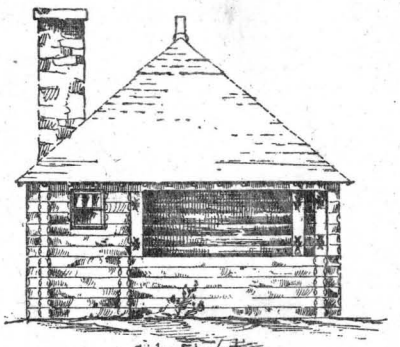
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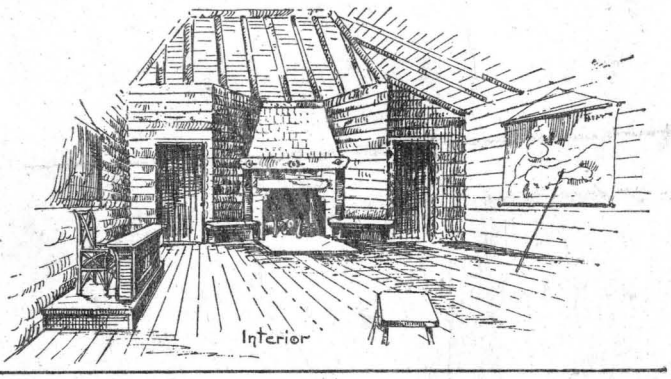
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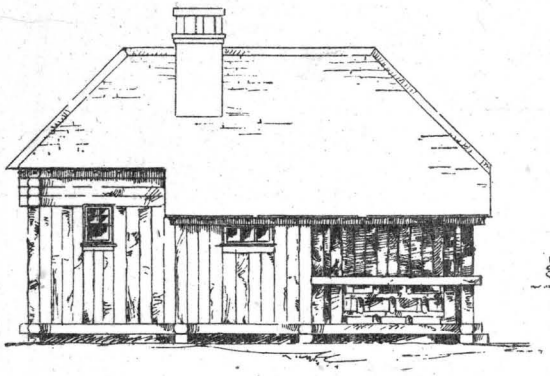
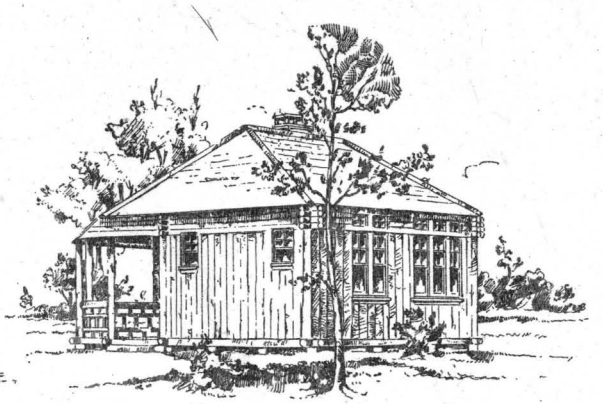
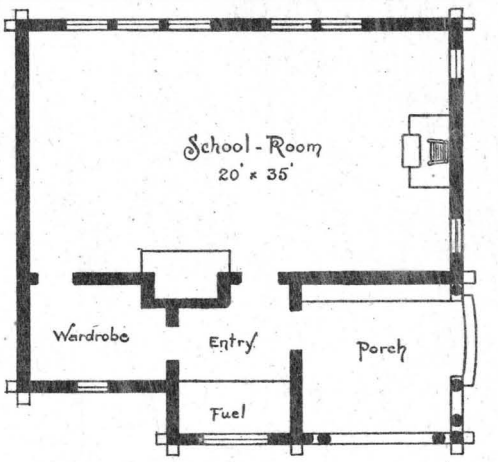
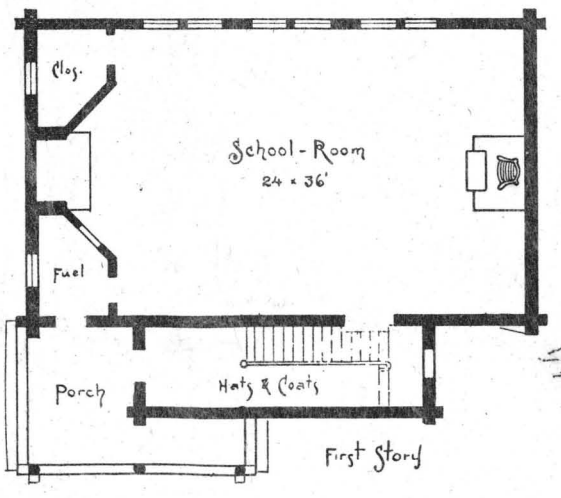
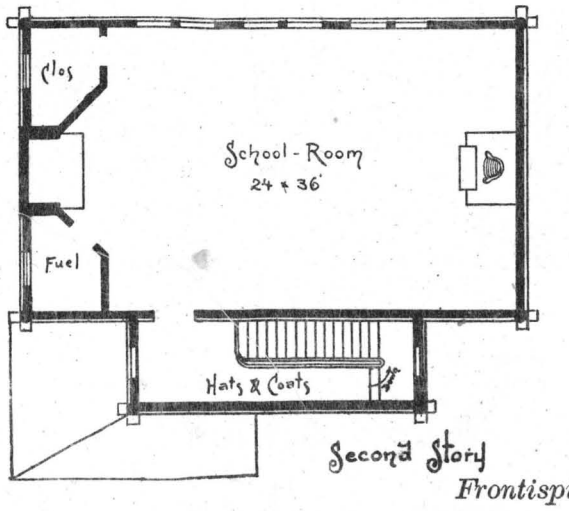




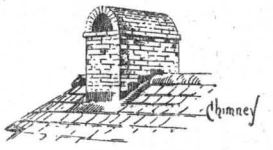




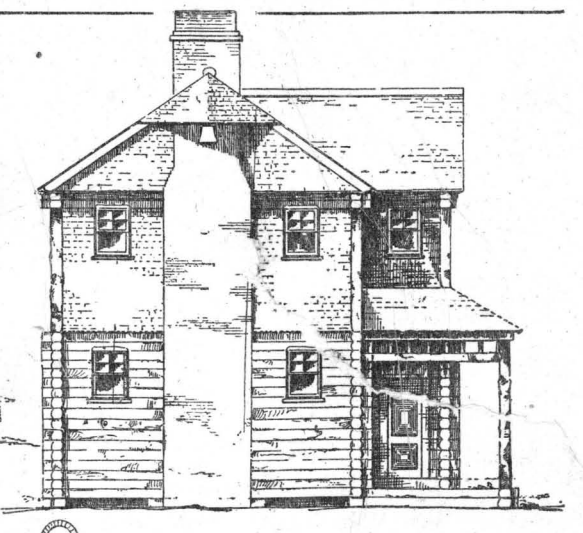
First Story



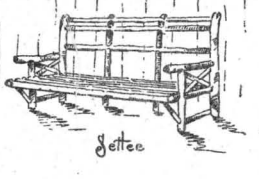
Second Story

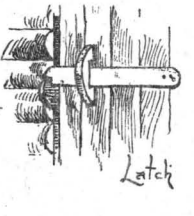

Chimney

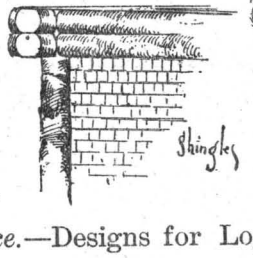

Perspective View




Teacher's Chair


Settee


Latch

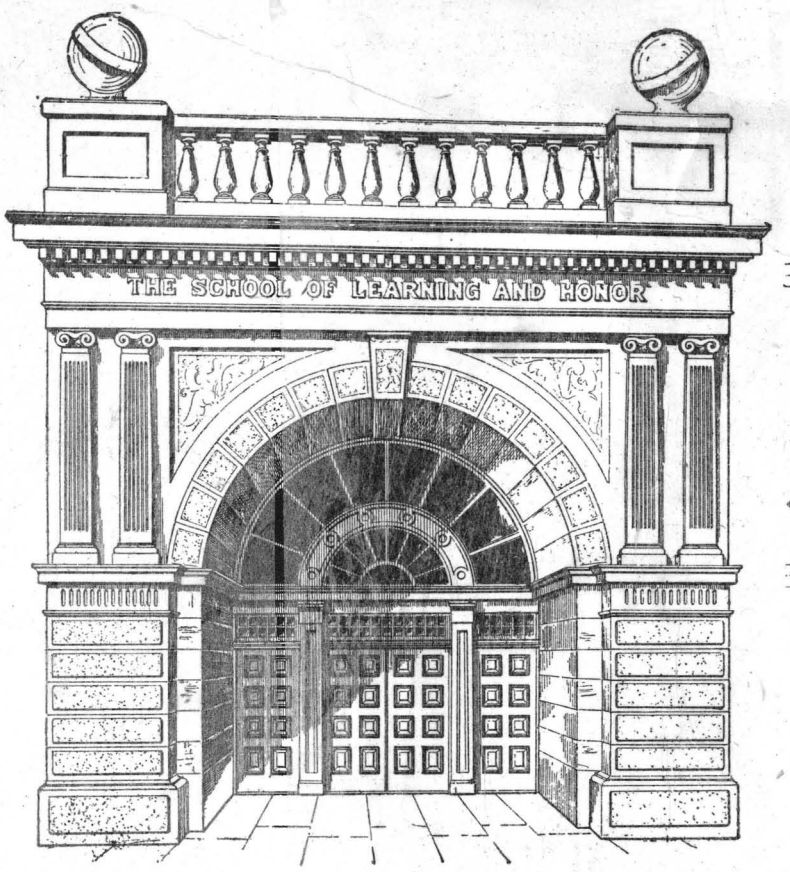

Shingles

Frontispiece.—Designs for Log School Houses.

PUBLIC HEALTH

IS

PUBLIC WEALTH.



THE ENTRANCE.

IT MATTERS NOT

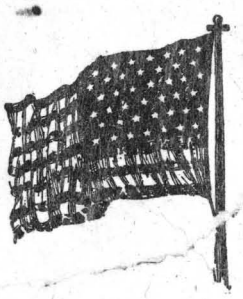
What the Cost,

IF IT PAYS.

To the Fathers and Mothers and the Teachers of Young America, and to everyone who is a friend of the School, and will stand up for the establishment and maintenance of the best possible Schools throughout this Country, and for this People, so that they may take the first place among Nations,

THIS WORK

is gratefully and respectfully dedicated by the Authors.

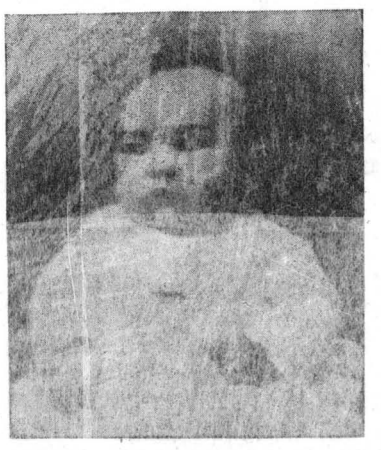


"THE School House is the bulwark of American Institutions," and the success of this foundation-institution is dependent in great measure upon its arrangement and sanitary construction. In fact, the importance of the work of building School Houses is paramount to that of all others in the rearing of good and healthy American citizens, and the production of the noblest types of American womanhood.

The children of to-day are the hope of the world.

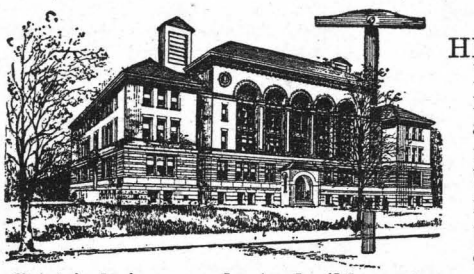
YOUNG AMERICA.

THE grand aim of all earnest School Boards and Managers should be to make the School Life of the pupil a healthy, cheerful and active one, and this is only to be accomplished by making the buildings and surroundings agreeable. A School House should be the most beautiful and healthful place in the town; so beautiful, in fact, that it would be the severest punishment for a boy to be prohibited for one day from entering within its walls.



"AMERICAN SCHOOL HOUSES" should be of such arrangement and construction that they can with truth be called "The People's Palaces." They should be provided with instructors that are sincere capable and earnest, employed only after passing a most rigid examination, proving beyond doubt their fitness, and none should be appointed through the merits of such a humbug as a political pull, otherwise the American scheme of popular education must surely come to grief.

INTRODUCTORY.



THE subject of School House Architecture as relating to Education and the health and morals of children, has become one of great interest; so much so, that in all enlightened communities every effort is being made to build on new models, to perfect what are now in use and to add all the new and improved methods, both in arrangement and construction. People may say what they please about teachers and teaching, but unless good teachers have good School Buildings they cannot accomplish the desired results; and every one should bear in mind that it is a noble thing to disseminate knowledge and most praiseworthy to lend all possible aid in that direction. It has been said by a well-known Educator, that any School at all where a child's health is not sacrificed nor its moral nature impaired is better than no school, but if one were to obtain his reason for the existence of Schools where a child's health or morals would be likely to suffer, we are sure he would promptly lay it at the door of the professional, though not always ignorant politician, who does the juggling for the people; and the people allow this to go on; they allow jobs in School Boards and strikes for boodle in the interests of the politician's friends and followers, that in any ordinary business transactions would not be permitted for a moment. The politician in the School Board should not be tolerated no matter whether he be lawyer, rum-seller or minister.

No matter how poor a community may be, that is no reason why it should be inflicted with bad Schools. See what poor Elizabeth, N. J., is doing (one of their buildings is illustrated in this work), just rising from bankruptcy and despair, and in order to build good Schools they have to mortgage the Buildings, but they must have them, but of course they have to economize and crowd within reason. It will pay every district, village, town and city to have good Schools, and that means good Buildings; the first questions asked by sensible people who think of locating in a town for either business or residential purposes are: is taxation high, and what kind of Schools do you have? If the taxes are high and the Schools are not good—the two go together generally, both being the result of ignorance and bad management—people will go to other places, and those of good sense are leaving the country towns, villages and farms in search of better Schools for their children, and this is one of the causes of abandoned farms; and if parents everywhere would take the interest they should in their Schools there would be less fault finding when too late to improve their children's education or regain their lost health. Let parents awake to the necessity and advantages of frequently visiting the School, of examining the Building—too many of them might properly be called hovels—take an interest in the teacher, and the work done by both teacher and scholar; agitate for good School Buildings and capable teachers, and be satisfied with no others, and we will have better Schools, better Towns and Villages, more interchange of thought, a higher grade of intelligence amongst the rustics wherewith to make their possessions and lives better, with fewer deserted farms and less grumbling all around. Right education is better than wealth, more powerful than power, and when coupled with a perfect physical development is the foundation of all that is good and great in mankind; and to prepare one for complete living is the function which education has to discharge; therefore we trust that the public will understand in what way we desire to assist them in this great work.

In bringing these plans and designs to the notice of School Trustees, Boards of Education, School Superintendents, Principals and Teachers and all persons who are devoted to the well being of the nation, we desire to say that in so doing it has been our aim to present a variety of practical plans that are adapted to the wants of all grades and sizes of districts, villages, towns and cities, although the best practical results can never be attained without special care and thought as to the requirements of each building, but these designs may be profitably used as a basis of study from which suitable buildings can be developed and perfected to meet their individual peculiarities, materials, variations in pricesof material, and labor, local methods of building, the amount of money appropriated or at the disposal of the committee, etc., etc. While we have contended for the past 15 years that ready-made plans of dwelling-houses are of little value for the reason that every man's house should be stamped with his own individuality of character and circumstances, yet experience teaches us that this is not true to the same extent when one comes to deal with the Public School House. What is perfectly proper for any 50 or 100 children of a certain age will be correct for any other like number. It will of course be understood that the plans do not necessarily require the exact exterior designs that accompany them, also that the dimensions of the rooms may be varied to suit different requirements without affecting either the general arrangement of the interior or the character of the design. The basement in small buildings is always a feature that can be introduced or omitted, according to the circumstances; brick can be changed to frame, and vice versa; a second story may be easily added to some of the plans that are drawn for but one, etc., etc.

Indifference to close, dirty, poorly lighted and badly warmed and non-ventilated School Buildings must no longer be thought of in any community if they are expected to exert the influence and gain the respect that is due to this fundamental institution.

While we are studying for and can safely promise greater improvements and perfection during the next five or six years, we may say that all the admirable features possible up to this time are embraced in the construction of the School Buildings here illustrated, and the utmost regard has been given to sanitary considerations in the warming, lighting and ventilation, coupled with a scientific study of all matters of convenience and safety, also having a noble style of exterior composition expressive of their purpose—as there are, we regret to say, all too many such Buildings erected in the pig sty style of Architecture or having the appearance of barns, factories or breweries—therefore making provision without waste for the cultivation of the æsthetic sense which is so easily developed in children and which should never be lost sight of in their training.

A successful Architect is he that can originate common sense, practical, convenient and sanitary Buildings with pleasing effects that can be executed at a moderate cost; and in all that pertains to the construction of Model School Buildings, we claim for our firm this success and their still more perfect development; and, by the way, we may also state that distance is no hindrance, as we furnish, in a thorough, most comprehensive and satisfactory manner, working plans and specifications for Building Committees to place in the hands of builders from correspondence alone. Therefore if your people are preparing to build, or wish to add to or remodel; or to improve warming and ventilation, or to correct existing defects of any kind; or wish any information or service connected with building matters of any description, we cordially invite them to correspond with us. If desired, we visit parties at any distance for consultation. Our terms are very moderate and our work extends throughout the Western World. We regret that we have not the required space between these covers to do the subject half justice, but still this work will, we trust, be found invaluable as a reference to all who are interested in this all-important matter pertaining to School-Work, and we hope at some future time to go into the subject in a more extended way, and also illustrate many foreign as well as American models, and we trust to make such a work in its field truly encyclopedic.

Most sincerely and faithfully yours,

PALLISER, PALLISER & CO., ARCHITECTS.

24 East 42d St., New York City.

★ DESCRIPTIVE. ★

CLEVELAND, OHIO, is without doubt a very beautiful city, containing as it does many fine streets and avenues, with a large number of costly residences, business places, churches and school houses. Some few years ago the Board of Education being anything but satisfied with the then prevailing method of erecting School Buildings several stories in heighth, box like in appearance, with lighting, general arrangement and a system of warming and ventilation all wrong and generally bad, determined to ascertain by means of a properly conducted public competition, open to all Architects, whether it was practicable to erect Buildings of good appearance and proportion not over two stories high and of the best arrangement, sanitary construction, etc., etc.; and with this end in view they issued the circular as given below to Architects throughout the entire world, allowing ample time so that the subject might receive due consideration previous to the date that sketches were to be handed in that would solve the apparently difficult problem.

CIRCULAR TO ARCHITECTS.

The Board of Education of the City of Cleveland, Ohio, hereby offers a premium of five hundred dollars for the accepted plan of a Primary and Grammar School, two stories high, to contain sixteen rooms, with a full basement under the building, and to be so constructed that from four to eight rooms can be added at any time without interfering with the rooms in the building or its symmetry; to be heated and ventilated in the best possible and most practical method. The rooms are to be large enough to seat on an average sixty pupils, separate wardrobes in each room. The Building to be provided with ample entrances and exits, to be substantial in all respects, neat and tasteful, but with no expenditure of money for mere ornamentation. The rooms shall be high enough for all purposes of health, but with due regard for economy in heating them. The building material shall be brick and stone combined, and plans shall represent one front and one side elevation, accompanied by sketches of basement, first and second floors, together with a detailed estimate of the material to be used. All plans shall be sealed and delivered to the Clerk of this Board on or before 12 o'clock M., May 10th, 1882, and all architects shall be requested to leave their plans in the possession of the Board.

The architect whose plan is accepted by the Board shall furnish the Board of Education the detailed working plans for contractors at regular architect rates, the Board reserving the right to appoint its own superintendent of building. The following items are also named simply as suggestions to architects:

1. Rooms of such a size as to afford fifteen square feet of floor per pupil; that is 900 square feet for about sixty pupils.
2. Window space not less than one-fourth of size of floor.
3. Height of rooms not to exceed fourteen feet.
4. Ventilation to introduce not less than thirty cubic feet of fresh air for each pupil per minute, and to remove an equal amount of foul air from the level of the floor.
5. Heating arrangements so connected with ventilation as to secure an even temperature that shall not differ materially in different parts of the room, and air to so enter that no pupil shall be exposed to unwholesome draughts.
6. Water closet accommodation to be abundant, well ventilated, and the building thoroughly secured against sewer gases.

F. MUHLHAUSER,
M. D. LEGGETT,
CHARLES GORDON,
CHRIS. A. NAUERT,
G. L. HECHLER,
} Special Committee,

THOS. R. WHITEHEAD, Clerk.

American Architects then gave much less study and attention than they do now to the planning of School Houses; in fact they were generally accustomed to the drawing of four outer walls, so many floors, and wooden partitions to divide them up into rooms, while proper sanitary construction, lighting, warming and ventilation had scarcely been thought of, much less given any attention by the majority of those persons calling themselves Architects.

Twenty-four sets of drawings were received by the Board of Education in answer to the circular, and as no limit of cost had been fixed, most of the competing Architects lost sight of the practical solution of the problem by designing impossible structures, as will be observed from the report given below. The large perspective view on opposite page, and plates 2 and 3 following, illustrate the design sent in by Palliser, Palliser & Co., bearing the motto, "Palmam qui meruit ferat," and which proved to be the prize design, as a perusal of the report made by the Committee of four practical Architects and experts appointed to act with the three members of the Board of Education in examining the plans and awarding the prize will show. Particular attention is called to that part of the report as to the general arrangement of the plan for its purposes, its compactness, economy, safety and thoroughness of construction; provisions for lighting, also the general architectural appearance, and last but not least, the arrangement for warming and ventilating.

To the Board of Education, City of Cleveland, O.:

GENTLEMEN: Your joint committee appointed at meeting of May 15th last, under the resolution "That a committee of four be appointed, who in conjunction with the Committee on Buildings shall examine the plans presented, and report to this Board the plan that, in their opinion, is the most practical and economical," respectfully submit the following:

In making this selection the committee were governed by the letter and spirit of the circular of instructions, the general excellence of the designs, and the ease with which changes could be made.

Of the various designs, twenty-four in number, nineteen were unanimously set aside early in the examination as having fatal defects, or as being decidedly inferior to others of a similar type, leaving those marked 7, 15, 17, 20 and 22 for further consideration.

After deliberation and discussion it was unanimously decided on the first ballot, that the design marked 15, distinguished by the motto "Palmam qui meruit ferat" was the most acceptable; and, so far as the recommendation of the committee can be said to constitute the palm, the authors are entitled to bear it.

The building is of that compact and economical type of plan which has a central corrider with rooms ranged on each side of it. This affords an opportunity for a general surveillance of the pupils while assembling or in leaving the building or passing from one room to another.

The provisions for lighting the school rooms are particularly good. The arrangements for warming and ventilating are better than any of those found in other plans. The construction is planned in a practical, safe and thorough manner.

In appearance the exterior of the building seems pleasing, well proportioned, without useless features, and evidently well and conservatively studied.

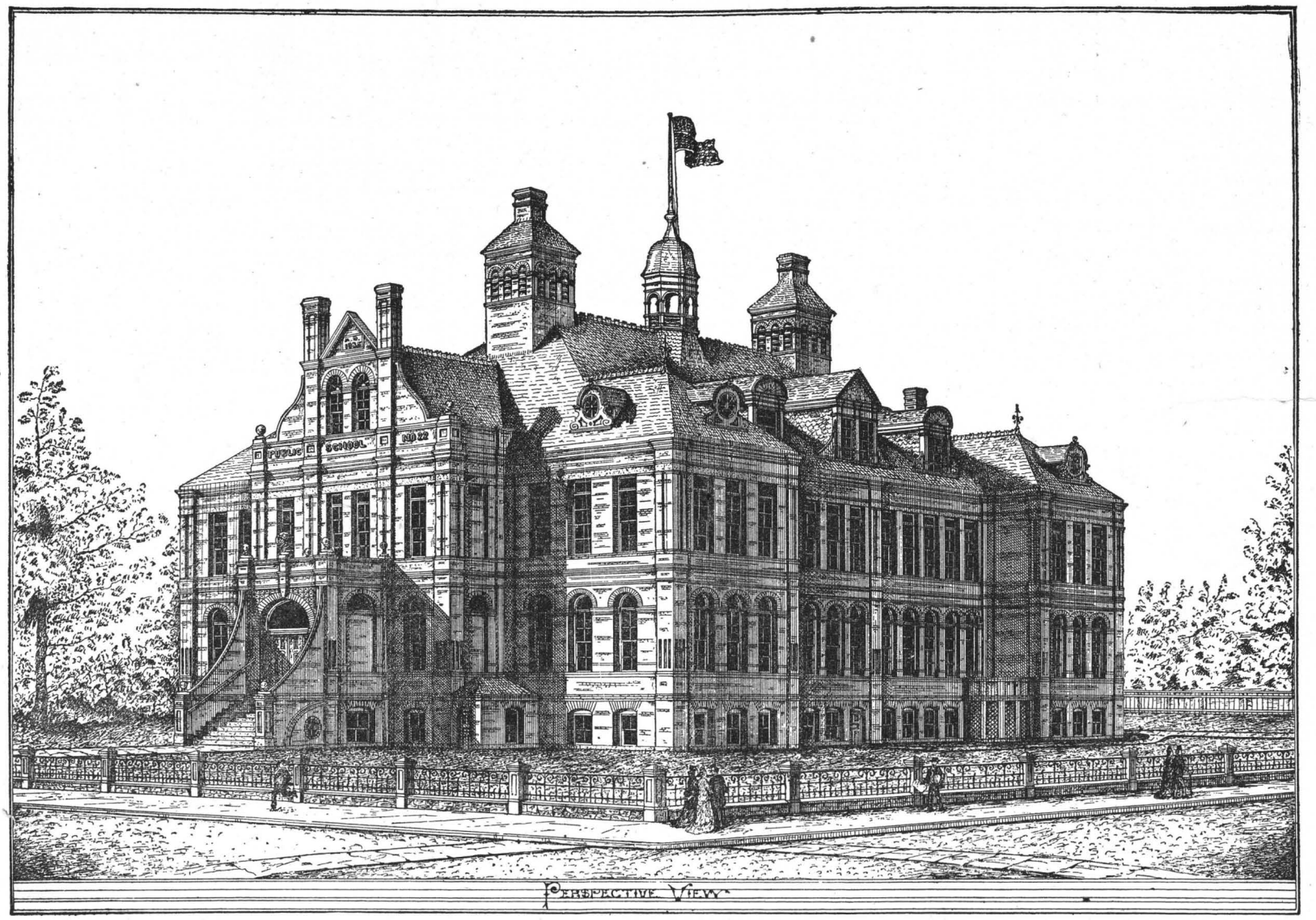
[Signed] M. D. LEGGETT,
S. C. BROOKS,
THOMAS SIMMONS,
F. A. COBURN,
CHRIS. A. NAUERT,
H. G. SIPHER,
G. L. HECHLER.

Cleveland, O., June 5, 1882.

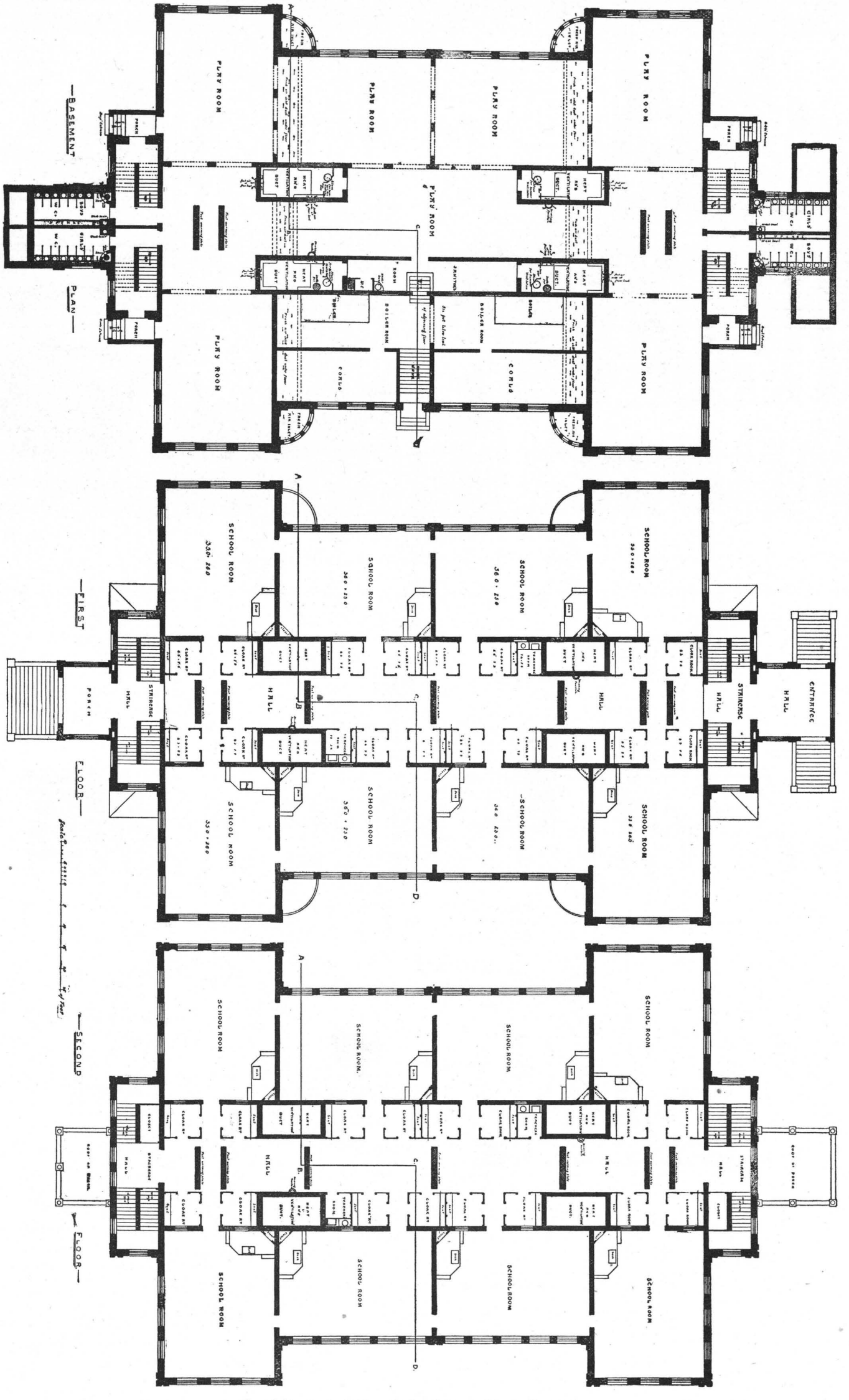
The full specifications, plans and details of construction given on pages 12 to 37, plates 4 to 25, give full particulars of The Fowler School House, 14th Ward, Cleveland, Ohio, erected from working plans, detailed drawings and specifications prepared by Palliser, Palliser & Co., Architects, and built under the eye of the supervising architect employed by the Board, and the cost of this solid and elegant building was in detail as follows:

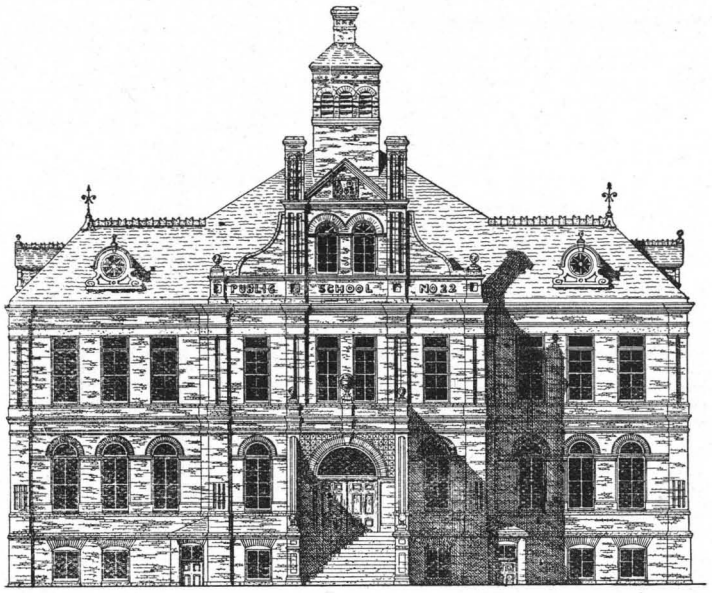
Mason Work,	$29,850 00
Carpenter Work,	14,843.00
Galvanized Iron and Tin Work,	1,443.00
Slating Work,	1,470.00
Painting Work,	1,107.00
Warming and Ventilating,	9,510.75
Total,	$58,223.75

This Building is without doubt the finest, most economical and the safest model of a School House for large cities to erect, and none should be built even in the largest and most densely populated cities that accommodate a greater number than 1,000 scholars; in fact the better rule to adopt is not over 500 or 600 scholars under one roof, and each building provided with a gymnasium, in which every scholar should spend forty minutes daily in exercise and physical development, together with instruction as to the methods and advantages of building up and maintaining perfect health and with it the best moral tone.

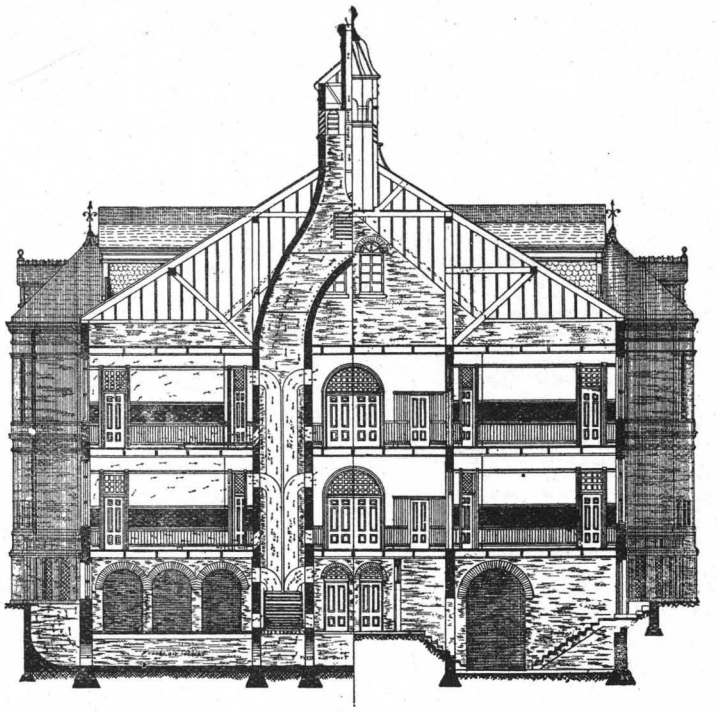


The above large perspective view is of the School House design that was successful in the Cleveland, Ohio, Board of Education competition, in which twenty-four architects took part.

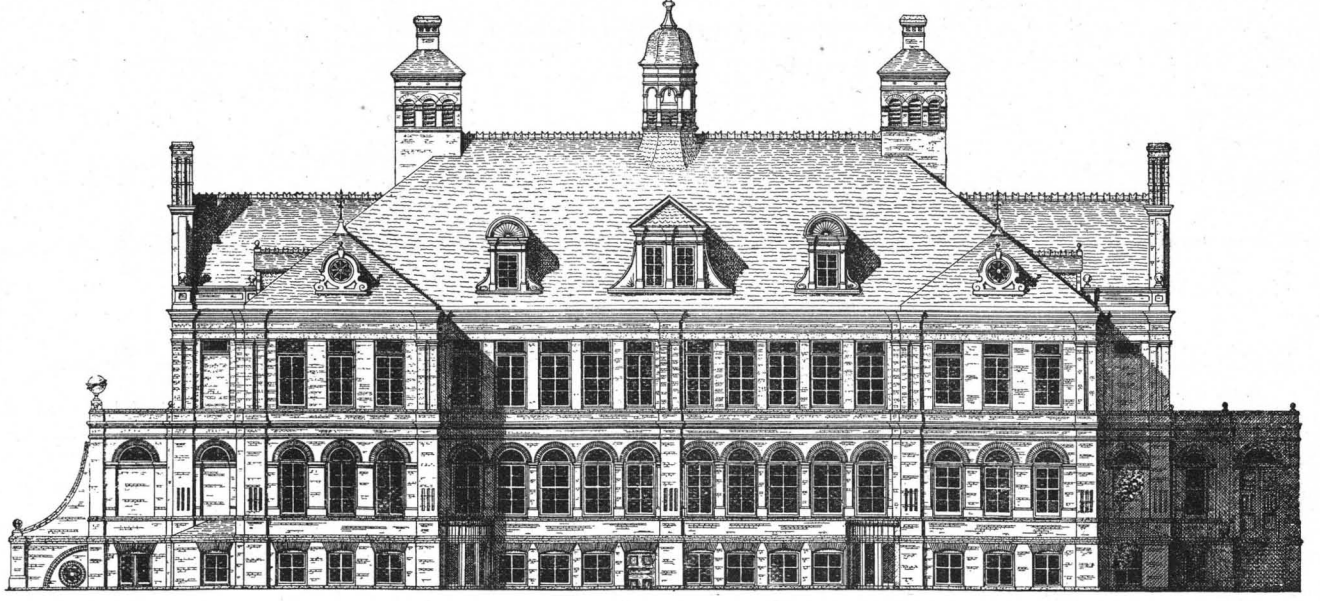




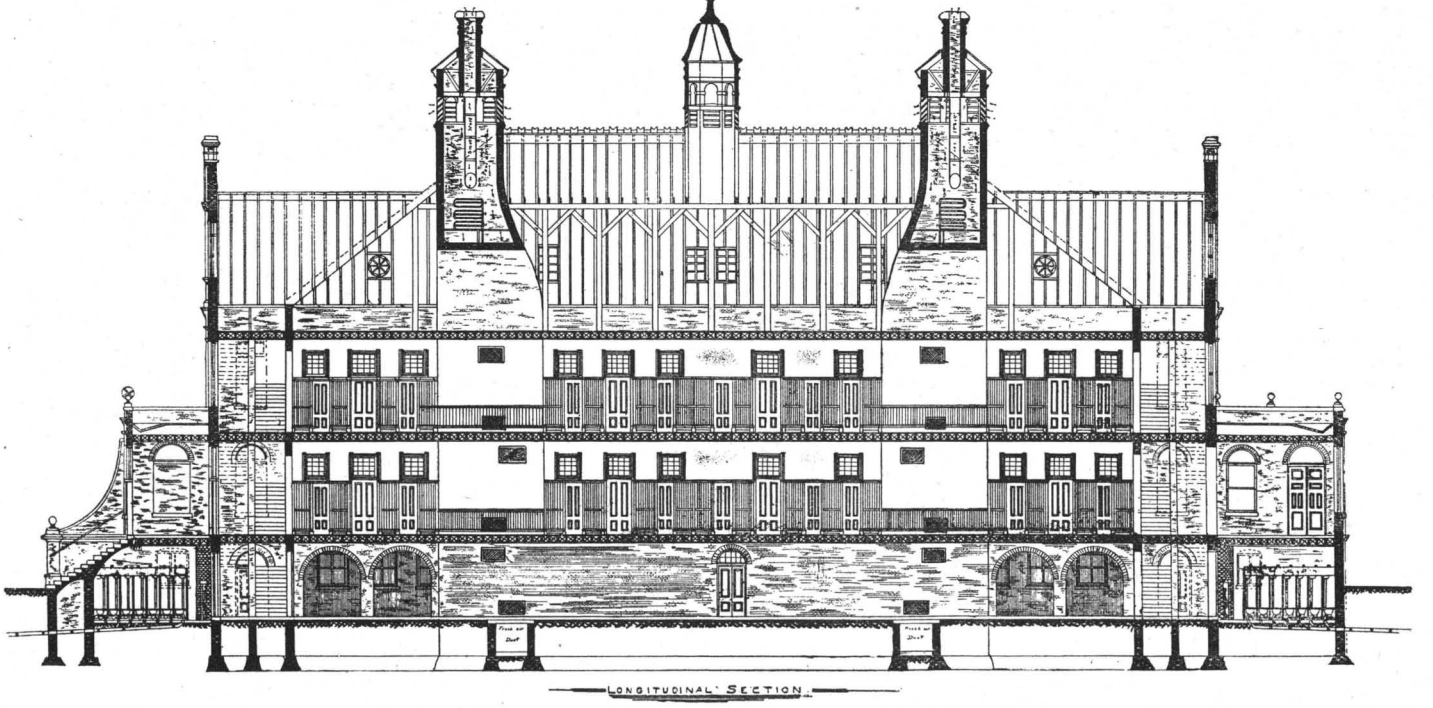
FRONT ELEVATION



HALF CROSS SECTION ON LINE A.B. HALF CROSS SECTION ON LINE C.D.



SIDE ELEVATION



LONGITUDINAL SECTION

SPECIFICATIONS

of Materials and Labor for the Mason Work required in the Erection and Completion of a Two-story and Basement Public School Building to be built in the City of Cleveland, Ohio, for the Board of Education, according to the Drawings made for the same by Palliser, Palliser & Co., Architects, of 24 E. 42d Street, New York City, and under the personal Supervision and Direction of the Superintendent appointed by the Board.

Drawings, etc. The several drawings herein referred to are as follows, and consist of—

Front Elevation	Plan of Basement.
Side "	" First Floor.
Rear "	" " Second Floor.
Side "	" " Attic and Roof

Cross Section and Longitudinal Section.

There are also a full set of detail drawings for all exterior and interior work, which with the above show all dimensions and delineations of the work, which is thoroughly represented and set forth by detail drawings. The drawings and all writing, interlineations, figures, and details are to be considered a part of and as illustrating these specifications, and must be accurately followed. Where figures are not given the drawings must be accurately followed according to their scale. On the plans, blue designates stone; red, brick; yellow, wood. The drawings and specifications are to be carefully preserved, and are the property of the Board, and must be returned to them at completion of the work. The Contractor shall not make any alterations in the drawings; should any error appear in them, it must be referred to the architects for correction.

General Conditions.

The Contractor is to give his personal superintendence to the work, to furnish all transportation, labor, materials, apparatus, scaffolding, and utensils needful for performing the work in the best manner, according to the drawings and specifications.

All the materials to be of the best description. Should the Contractor introduce any materials different from the sort and quality herein described, or meant to be implied, it shall be immediately removed at the Contractor's expense at any time during the progress of the works.

The works are to be executed in the best, most substantial, and thorough workmanlike manner, according to the true intent and meaning of these particulars and the drawings referred to, and which are intended to include everything requisite and necessary to the proper and entire finishing of the mason work, notwithstanding every item necessarily involved by the works is not particularly mentioned, and all the work when finished to be delivered up in a perfect and undamaged state, without exception.

No part of the work to be underlet, unless by written consent of the Board; otherwise, sub-contractors will not be allowed on the works.

The Contractor to be responsible for all violations of law caused by obstructing streets, sidewalks, etc.; to give to the Board of Works, local commissioners, surveyors, etc., all requisite notices; to obtain official licenses for temporary obstructions, inclosures, openings into common sewers, and to pay all proper and legal fees and charges to public officers and neighboring proprietors, arising from the constructing and carrying out all work as mentioned in the Mason's specifications; making good any damage in mason work occasioned to adjoining premises, and keeping up lights, etc., as required by night; shall construct proper inclosures, fences, and walks for the protection and convenience of the public during the progress of the works, and perfectly reinstate pavements, etc., to the perfect satisfaction of the Board or City Surveyors, and shall hold the Board harmless for any damage or expense arising therefrom; and, at completion of the works, shall remove all rubbish and other mason's waste materials from off the premises.

The Carpenter will make all patterns, and will provide and set centres on which to turn arches—no arches to be turned without centres; will provide suitable protection to all openings to keep out the cold, rain, etc., and clear the building of all carpenter's waste materials before plastering is commenced.

The Mason must provide coal and stoves in cold weather for warming the building while his work is going forward, and until it is dry.

All masonry, as laid, to be properly protected from the weather by the Mason.

Excavations. Do all necessary excavation as required for basement, boiler and coal rooms, cold-air ducts, bases of warming and ventilation shafts, areas, footings of all walls and piers, as shown by the drawings, to firm and solid ground, and so that all are clear of frost. Dig the bank well away from the walls, and leave the same open until the mortar in walls is well set and dry. Excavations for all drain pipes, manholes and sewer connections, to be done by the Mason as required, and to be well filled in and made good.

Grading. Fill in around and pack the earth against the cellar walls after the mortar is dry, and level it with the bottom of the underpinning. Grade the excavated earth around and slope off the ground on all sides of the building, as directed; and remove all surplus earth from off the premises and the top soil left on top at completion; walks, etc., arranged as directed.

Footings. Lay down footings under all the walls of the building, both stone and brick, of flat stones not less than 6″ thick and projecting 6″ to 8″ on each side of the walls above, except where otherwise specified or shown by the details; these footings to be composed of large stones, each stone filling the course in width and height, close fitted and flushed up with spawls and cement mortar, these stones to be laid on the natural undisturbed earth.

Foundations. Properly lay up all foundation walls with good flat building stone, in thickness as shown on plans, of flat bed, firm and well bonded, laid in clean sharp sand and cement mortar, in parts of one of cement and one of lime, laid by and full to a line on both faces, and flush and point at completion; lay down in like manner substantial foundations under all dwarf walls of cold-air ducts, exterior steps, area ways, and all other parts as required by the plans. Leave all openings in walls for drains, gas, water, or other pipes as required, directed, or as shown on plans, and build all stone work of every description as required in all the foundations up to grade level, or basement floor as the case may be.

Areas. Build all walls for outside areas to the water-closet windows; pave the area bottoms with brick and cope with cut stone 7″ × 10″ in size and let in a strong wrought-iron area grating flush and level with top of same.

Underpinning. At the top of the foundation walls at grade level lay a sill course as shown by plans, and from this up to height as required, to receive the water table, face the underpinning with Berea stone in irregular ashlar, rock-face work, well bedded and jointed, and to have level beds and plumb joints; and at each corner or angle, whether on window or door openings or corners of pilasters, etc., to have a drafted margin on face not less than 1″ wide; all the reveals to windows, etc., to be neatly and squarely cut as required, to fit snug up to casings. This underpinning to be laid up in the best manner possible, well bonded, and no stone to be over 14″ high, and at completion to be washed down and left clean and neatly pointed with a colored joint trimmed true and even, the facing of all porches to basement to be of same work, etc., as the underpinning down to floors of same. The stone underpinning to be backed up with brick, well bonded, etc.

Damp Course. A damp course of "pure bitumen damp-course cloth" to be placed on all outside walls at a point not to exceed 12″ from the ground level; and on all inside walls at a point not to exceed in height the finished levels of basement floor, this damp course to be placed so as to cover the entire walls clear out to both inner and outer edges, and to have the joints properly lapped, etc.; this damp course to be laid on a level surface of the walls formed by flushing same up level with mortar, etc.

Flagging. The cold air ducts to be covered over with flag-stones not less than 2½″ thick, having a firm and solid bearing at each end on side walls, and to have the joints well fitted and put together with cement mortar, and the under side of this flag covering to be straight and smooth and clean.

Porches. The four basement entrance porches and the side entrance porch to first floor and basement to have the floors covered with good flagstone, laid on not less than 12″ sand in centres, and neatly pointed around the edges to adjoining work.

Steps, Stairs, etc., in Basement. All steps, stairs, landings, etc., on the basement floor (except the small flight of stairs up to janitor's office) are to be of cut stone, as shown by plans; these steps are all to be built in solid masonry, and all to have 1¼″ to 2″ lap; rise and tread of these steps, stairs, etc., to be as required and as shown by the plans, and where steps show on the under side to have the lower back corner chamfered off between the bearings and neatly cut on the under side and on all exposed surfaces. The joints or beds of all steps to be made in fine oil putty, and neatly cleaned off so as to make watertight, and prevent water from running down through when washing out, etc. (this applies to all stone stairs, steps, etc., in the building).

Drains. The drains are all to be put in as shown by the plans, drain pipe to be of best quality Akron sewer pipe and in sizes as marked on the drawings, and connected tightly with the catch basins as shown; these pipes to be laid low enough to drain the whole building, to be placed on outsides of the walls so as not to interfere with the foundation, joints cemented tight, and connections brought up for all roof leaders as required. Put in all traps where shown; use bends and curves for all crooks, whether vertical or horizontal. No pipe to be clipped in any case. All pipes at connections to leaders, etc., to be securely guarded against the introduction of sand or earth by brick and cement or other watertight and imperishable materials; make all joints clean and tight of cement, perfectly smooth on inside; supply each trap with an opening or trap screw on top, so it can be cleaned out easily if necessary. All pipe to be laid on a true and even grade, with as much fall given them as possible; and all junctions to be in one piece, and of such shape as is necessary to make the different connections required. Catch basins to be built of brick walls 8″ thick, laid in cement mortar, bottom of brick 8″, and the whole well coated in with cement. A flag cover to be placed over these catch basins at grade level. From catch basins to the street sewer connect and lay 8-inch pipes as shown, these discharge pipes to have a bend turned down into basins and to run within 18″ of bottom of same.

Note. All drains for outside of building, branch for boiler connections, branches for the 4 cesspool connections in water closets, and the drains running under W. C., are all to be of the Akron tile, put in by mason.

Inside Drains by Plumber. All the drains on the inside of the building receiving the wastes from water closets, bowls, sinks, etc., are to be of iron, and will be put in by the plumber. The mason to render the plumber such help and assistance as may be required in placing his pipes through the walls, etc., and to do all cutting away of masonry, filling around pipes, etc., as may be required to make a complete and first-class job in every particular. And all drains are to be left open twenty-four hours after they are laid, and the superintendent notified, so he can examine the same thoroughly before covering up; drains to be covered only upon superintendent giving a written order to that effect. When filling around drains great care to be used in packing the earth in solid, and the ground packed in with water and made as solid as if it had not been disturbed. The connections for water-closet cesspools to come up within 10″ of W. C. floor and there stop.

Basement Floor. The entire floor of the basement, including boiler and coal rooms, water closets, cold-air ducts, play-rooms, etc., are all to be levelled off and settled thoroughly, and to be covered flush and smooth throughout with cement concrete in three parts of clean coarse gravel and good best quality cement 3″ deep, and finished with a true and even surface. This cement concreting to be put down after all drains, water pipes, steam pipes, etc., are in place and complete, so cement floor will not have to be taken up at any part. The water-closet floors to be graded with a fall to the cesspools so that all water will drain to same. And all floors, etc., as above in the basement to have a covering of Seyssel Rock Asphalt and Trinidad Asphalt pavement laid over same not less than ½″ thick, laid on true and even; the sides of the cold-air ducts and all mason work of same up to level of play-room floors—also boiler and coal rooms—to be well coated with asphalt, applied hot with a brush and spread on even and true, and the walls, etc., well covered.

Whitewashing, etc. All brick and stone work and walls on the inside of the basement story (except the water closets and main staircases) are to be pointed, properly stopped, etc., and lime whitened twice throughout; care to be used in fixing the whitewash so it will not rub off, and the whole done in an even and perfect manner and complete in every particular. The warming and vent shafts to be whitewashed same as above; this to be done before the pipes, etc., for warming are put in, and to be touched up after where necessary by cutting and putting in pipes, etc.

Staining, etc., Inside. The walls in the boys' and girls' water closets and in all the staircase halls from basement up to top of second-story, side vestibule, also inside of all first-story porches or vestibules, to be stained with Breinig's Lithogen Silicate red stain for brick work properly and evenly applied with a brush, and the steps, stone work, etc., kept clean and free from the stain.

Brick Work. Use good, sound, hard, well-burned brick throughout (which must be laid wet in dry warm weather, or if laid in damp or freezing weather the brick must be kept dry), with flushed solid joints, leaving no interstices or empty spaces in the walls (except the air space in the outside walls of school rooms on 1st and 2d stories, which is to be 2″ wide, having 4″ brick wall on the inner face properly tied to the outside wall with Morse patent wire wall ties 9 inches long and set in every 6th course and about 2 ft. apart). All brick to be laid up in the best and most workmanlike manner with mortar composed of good lime and clean sharp sand in the proportions of two of lime and four of sand, or of such other proportions as may be considered desirable. All brick walls to be made perfectly level and straight to the proper and exact height and to a true line from one end to the other, even to the splitting of a brick where necessary, so that the carpenter can size his joists to an exact width and place them directly upon the wall without blocking up with chips or pieces of wood. All walls to have necessary openings and all vertical channels for ventilation and iron pipes of every description as required to suit all other work in the building coming in contact with the mason work. Build brick discharging arches to take the weight of walls from all lintels over doors, windows, or other openings in walls. Build ledges for support of any floors, timbers, etc., as required; all face work, arches, brackets, cornices, etc., as shown by the drawings. Build the vent flues from water closets as shown, having ends open at the bottom, and arranged with openings in same at the floors above, so the pipes for steam and return and soil vent pipes can be placed and securely fastened in the same. Build the tops of ventilation shafts, chimney tops, etc., as shown, the chimney tops in centre of vent shafts to each to be carried on 4 pieces of railroad iron, having a ⅜″ thick boiler plate, with hole 21″ diameter, in centre, to form the bottom and to receive the iron smoke flue from boilers, as shown. The brick work to be well bedded, flushed up, and tied in every sixth course, and worked in regular bond; fill in and back up behind all ashlar and stone work facing the walls of basement, play rooms, water closets, etc., down to floors of same on inside; point up close to all sills, copings, casings, and projections. Bed solidly all door and window frames; underpin all sills with suitable mortar after the walls are dry. Provide the needful materials of every description, and cover the walls from the weather at all necessary times. Attend other mechanics when required to arrange their work to come in right with the mason work. All brick or facing for exterior walls, chimney tops, vent shafts, inside of porches and stairways, must be of the very best assorted hard-burned bricks of even color (except the arch bricks on arches of 1st story window and door openings, porches, etc., which are to be of pressed brick, dark red in color), and all brick face work to be laid up in G. H. Morrill & Co.'s mortar black, and all the face work throughout to be neatly jointed. The brick work in basement walls, inside vent and heat shafts, water closets, etc., to have joints neatly struck. All other parts where brick work is plastered to have joints cut off with trowel.

Terra Cotta. The panels for name and dates to be of red terra cotta (and on front gable only); these to have solid raised letters standing out from face work 1½″ to 2″, and to be properly built, anchored, etc., into the brick work.

Boiler Setting. The mason is to furnish all the necessary brick work for setting the steam boilers, and to do all mason's work of every description required in the setting of boilers to make the same perfect and complete in every particular for the purposes intended, and as directed by the warming and ventilating contractor.

Stone Work. All the cut stone work on the building to be carried out as shown on the plans, the exterior facing or trimming stones to be of best quality Ohio stone, all cut as shown on plans, details, etc., for same; this stone trimming includes all window and door sills, water table, sill and lintel courses, corbels, copings, chimney cap stones, sills to vent shaft openings, cold air inlet openings and covers over same, covers over front and outside basement porches, newel posts and buttresses to porches, and all the cut stone work of every description on exterior of building (except outside steps, which are to be of harder stone than above). All the outside stone work, from the water table up, to be either sawn and rubbed smooth, or fine tooled, as the contractor chooses; the whole of the steps throughout, both to basement and to the story above, also all stair treads in the four main staircases, platforms to same, front and other porch floors, all to be of tooled stone and of the hardest kind the market affords; main door sills to first story and basement, also the stone steps in basement at water closets, side entrance, etc., to be of same kind of stone as the outside and other steps. The stone work of stairs to have a bearing of 4″ on the walls, and to be cut true, even, etc., as before mentioned, and set in place with putty on the beds. All stone work to be cut as required and delivered at the building properly fitted with all necessary lewising and drilling for anchors, etc.; and all joints to be trimmed and dressed off evenly by the stone cutter after the work is in place, and all stone work cutting, etc., to be done in the best manner possible; all washes of sills, water tables, etc., to be tooled, and other face work either fine tooled or sand rubbed, as preferred by stone cutter.

NOTE. The floor in staircase halls at each entrance to be of stone same as the main stair platforms; also the two platforms on top and bottom of stairs in side entrance vestibule first floor, the parts of stone being represented as far as practical by blue coloring on the tracings.

Iron work. Anchors for floor beams of ½″ × 1½″ iron. Furnish and fix anchors as required to anchor first and second floor timbers; also attic timbers, placing one anchor every 4 feet throughout both on inner and outer walls, properly placed so as to do the most good, well spiked to lower edge of joists with wrought-iron spikes, and to run into brick work of walls 14″ across end of joists, and 10″ on side of joist at ends—those on sides of joists to be long enough to reach to second joist from wall. No strapping at ends of floor timbers from one timber to another will be allowed except on attic floor, but each room or hall tier of timbers on first and second floors to be so anchored to walls all round as to be entirely independent of each other, to prevent the sound being transmitted from one room to another. The mason is also to furnish and place all other anchors in the building as required, to anchor all cut stone work, chimney top stones, steps, platforms, and stone work of every description in a thorough and first-class manner; also all anchors required in the placing of roof timbers in any parts requiring same; wall plates in all cases to be anchored down to the walls every 8 feet, and well bedded in mortar.

Iron Ladders. In each of the main warming and ventilation shafts an iron ladder is to be walled in one corner as shown; this ladder to be of ½″ iron made to lay in the walls on each end, and to have the iron rounds placed about 16″ apart, and to run from basement up to top of vent shafts.

Iron Lintels. 5″ heavy rolled I-beams to be placed over all window openings in basement, first and second stories where ends of floor timbers come over; also place same size rolled beams over any other opening in the building where an arch cannot be turned low enough to give 12″ of solid brick work for bearings of all floor timbers, etc.

Iron Doors. The mason is to furnish and place in position in the main warming and vent shafts, at base of each and at top where two come into one, iron doors not less than 2′ 6″ wide and 6′ 0″ high, to be hung in a suitable manner to walls and properly secured, etc.—these doors to be of corrugated iron two ply, and to be made as near air tight in the brick opening as practical, and arranged so they can be opened from either side. In the small vent and warm air duct in centre of the building there is to be small doors placed at each story large enough for man to get in at, these doors to be made similar to other iron doors, properly hung, etc., as before mentioned; other warm air or vent flues to be built as required, smoothly plastered on the inside, and to have hand holes left for insertion of pipes as required—said hand holes to be neatly walled up after pipes are in place.

Ventilator Openings. All to be left in walls as required throughout, the openings to have flat arches turned over so registers will fit snugly into openings, and where the openings are more than 20″ wide to have ⅝″ × 2″ iron bars placed across same for carrying arch or brick work over the soffits of all these openings; and jambs, etc., of same to be laid up smooth, true, and even, same as inside face work, and for the sizes of openings required for all warm air and vent registers the mason is to be guided by instructions received from the warming and ventilating contractor, and make openings such sizes and in position as he directs.

Iron Work for carrying brick work in the warming and vent ducts, etc., to be supplied by the mason as required and as shown by plans. At the basement ceiling level, where the shafts are reduced in size, two 9″ (light) I-beams to be placed across to carry wall above, and an arch 8″ thick to be turned from end walls over door to these I-beams, said arch to be kept down low enough to allow floor timbers of first floor to run over. In the longest duct this arch will have to be put in double, using an additional I-beam to carry centre part. At the top part of the ventilation shafts, where the two merge into one, to have all necessary iron braces, plates, etc., to fully support the sides, and the necessary I-beams to carry all brick walls where set over, as required or as shown by plans and drawings. The iron work to carry two chimney tops in main vent shafts to be as before mentioned, and ceiling at this point formed with ⅜″ thick iron plate.

NOTE *on Warming and Ventilating Contractor's Work.* The warming and ventilating contractor will furnish all the necessary iron work, as required, for carrying all radiators, steam and return pipes, for bracing and supporting all warm air, smoke pipes and ventilation pipes (other than for plumbing); will put up all iron work as required for getting footways to the different pipes, but the mason is to afford him the requisite facility for the placing of all his work, to do the cutting of walls, etc., and fill and point up neatly around iron work, pipes, etc., after same are in position, as required and as directed.

Walls, etc. The ceilings of basement, first story, and second story (except where ceilings are formed with stone work of steps, platforms, etc., and the porch ceilings, or under any wood staircases) are to be lathed with sound lath of full thickness, laid on full $\frac{5}{16}$" apart, well nailed at all bearings, and joints broken every 18'; under no circumstances must lath stop and form a long straight joint, the lather to see that all cross furring strips are well nailed to beams. Should there be any not properly secured, stop and notify carpenter to make permanent the same.

Plastering. All brick walls in the first and second story school-rooms, main halls, and class-rooms are to be plastered directly on the brick with one good coat of brown, well-haired mortar; the ceilings of basement, first and second floors to have one good coat of brown, well-haired mortar, made of pure unslacked lime and clean, sharp bank sand, free from loam and salt, and best cattle or goat-hair, to be thoroughly mixed by continued working and stacked up in the rough a sufficient length of time before putting it on, to be properly put on and applied with sufficient force to secure strong clinches; level and float up the brown coat, and make it true and even with grounds at all points (grounds on brick walls to be $\frac{5}{8}$" thick).

NOTE. There is to be no plastering on side-walls in basement, main staircases, porches, vestibules, and no plastering on ceilings of porches, boys' and girls' waterclosets in basement, stairways in the basement, under stone stairs in staircase halls, under wood staircases; neither need there be any plastering under any of the wainscoting at any part of the work.

Finish of Walls. Cover all the brown mortar with a good coat of best soapstone, hard finish, compounded of finishing lime, putty, and fine pulverized soapstone in parts, three of soapstone to two of lime putty, thoroughly mixed, so as to secure a good, handsome, and workmanlike job in every respect. All walls to be finished straight and plumb and even with the grounds; all angles to be maintained sharp and regular in form. Leave all floors broom clean. Do all necessary patching and mending after other workmen, and leave everything in a perfect and complete state.

NOTE. This finish to be of Francestown soapstone finish.

Blackboards. The blackboards around all walls of school and class rooms to be plastered on the brick with brown coat same as other walls in the building, and made perfectly straight, true, and even in every respect. The finishing of these blackboards to be done in the very best manner possible (with blackboard composition), and in all respects finished just like sample to be seen in the offices of the Board of Education, and to the full satisfaction of superintendent.

NOTE. Blackboards made of Patent Improved Blackboard, as furnished from Francestown soapstone finish.

Summary. The mason contractor is to do all mason work (of all kinds whatsoever) as required, to fully complete the building fit and ready for occupation, as shown by the drawings, even though not mentioned in this specification or *vice versa*, and to the true meaning and intent of the same; to afford the architects or superintendent the usual facilities for the inspection of all work and materials at any time during progress of same, and which are to be under their control, and shall deliver up the whole of the work called for by the drawings and this specification in perfect repair, clean, and in good condition when complete, and remove all masons' waste materials, etc., from the premises.

SPECIFICATIONS

of the Work and Materials for the Carpenter Work required in the Erection and Completion of a Two-story and Basement Brick Public-school Building, to be built in the City of Cleveland, Ohio, for the Board of Education, according to Drawings made for the same by Palliser, Palliser & Co., Architects, of 24 East 42d Street, New York City, and under the Personal Supervision and Direction of the Superintendent appointed by the Board.

Drawings. The several drawings herein referred to are as follows, and consist of:

Front Elevation.	Plan of Basement.
Side "	" " First Floor.
Rear "	" " Second Floor.
Side "	" " Attic and Roof.
Cross-section.	Longitudinal Section.

There are also full detail drawings for all exterior and interior work, which with the above show all dimensions and delineations of the work which is thoroughly represented and set forth by the scale or detail drawings. The drawings and all writing, interlineations, figures, and detail drawings made or to be made are to be considered a part of and as illustrating these specifications, and must be accurately followed. Where figures are not given, the drawings to be carefully followed according to their scale. On the plans blue designates stone; red, brick; yellow, wood.

The drawings and specifications are the property of the Board (and must not be used for any other building except as built by them), and are to be carefully preserved and returned to them at the completion of the work. The Contractor shall not make any alteration in the drawings or specifications; should any error appear in them he shall refer it to the architects for correction.

General Conditions.

The Contractor to give his personal superintendence to the work, to furnish all transportation, labor, materials, apparatus, scaffolding, and utensils needful for performing the work in the best manner, according to the drawings and specifications.

All the materials to be of the best description. Should the Contractor introduce any materials different from the sort and quality herein described, or meant to be implied, it shall be immediately removed at Contractor's expense, at any time during the progress of the works.

The works are to be executed in the best, most substantial, and thorough workmanlike manner, according to the true intent and meaning of these particulars and the drawings referred to, and which are intended to include everything requisite and necessary to the proper and entire finishing of the Carpenter's work, notwithstanding every item necessarily involved in the works is not particularly mentioned; and all the works when finished to be delivered up in a perfect and undamaged state, without exception.

No part of the work to be underlet, unless by the written consent of the Board; otherwise sub-contractors will not be allowed on the works.

All moulded or cut work is to be made from the solid; all curved or circular work is to be either sprung on or sawed from the solid. No sawing in will be allowed.

All mouldings, architraves, etc., must be made in strict accordance with the detail drawings. Any work that is not in accordance with details, will be removed at Contractor's expense, at any time during the progress of the works.

The Contractor to be responsible for all violations of law caused by his obstructing streets, sidewalks, etc., with his materials, and to pay all proper and legal fees and charges to public officers and neighboring proprietors, making good any damage occasioned to adjoining premises, arising from the construction and carrying out all work as mentioned in the Carpenter's specifications; and shall hold the Board harmless for any damage or expense arising therefrom; and shall clear the building and sweep it out before the masons commence plastering; and, at completion of the works, shall remove all rubbish and other materials from off the premises, scrub the floors, wash the windows, and leave the building fit and ready for occupation.

The Carpenter to do all necessary wood work, cutting, etc., for other craftsmen on the building; to provide and set centres on which to turn arches; also will furnish suitable protection to all openings, to keep out the cold and rain, and hang doors so that the building can be locked up soon as inclosed, by putting in temporary doors and locks; shall provide suitable cases in which to keep the plans and drawings during the progress of the works.

Timber.

The whole of the timber used in and throughout this building to be of the best of their several kinds, sawn die square, well seasoned, and free from sap, shakes, and other imperfections impairing its durability and strength. The timber not exposed to be of white pine; timber on exterior of building, that is exposed when finished, to be best quality pine.

All timber, girders, trimmers, joists, truss beams, partition studs, roofs, balconies, etc., must all be prepared and framed according to the plans, sections, and details. All joists and studding must be properly sized to widths and jointed, and joists in all cases to be placed with crowning edge upwards, those in spans over 25 feet to be worked crowning 1 inch before being placed in the building.

Sizes of Timber.

Principal story joists 2½ x 14, and placed 16 inches from centres.
Second story joists, 2½ x 14, and placed 16 inches from centres.
Third story joists, 2 x 12, and placed 16 inches from centres.
Posts, supporting roof, 8 x 8 under all girders, purlins, etc., from walls below.
Roof rafters, 2 x 8, and placed 24 inches from centres.
Hip and valley rafters, 4 x 12.
Ridge tree, 2 x 12.
Purlins, 8 x 8 and 8 x 10, as marked on sections.
Principal rafters, 8 x 10 for bell-cot trusses.
Collar beams, 5 x 7.
Tie beams, 8 x 10 for bell-cot trusses.
Braces, 5 x 7.
Struts, 5 x 9 and 6 x 8 as shown.
Wall plates, 4 x 12 for main brick walls and for dormers, etc., 4 x 6.
Studding for dormers sides, etc., 3 x 6 and 20 centres.
Porch roof rafters, 2 x 8 and 16" centres.
Posts, girts, plates, etc., for bell cot as per details.

Also furnish any other timber as required or shown by the drawings, and of the requisite sizes, etc.

Framing.

The figuring of heights of stories on the sectional drawing are in the clear, and figures on plans for interior work are for dimensions in the clear between brick walls. All figures on exterior are on basement or cellar plans for the stone, and on first and second floor plans for brick. All floor joists to be stiffly and fully spiked at each end to each other where they come together.

Cross-Bridging. Bridge all floor joists in the building every five feet with 2" x 2" pine stuff, properly cut in between timbers as soon as the joists are levelled and thoroughly spiked, and nail at each end with two 10d. nails.

Headers and Trimmers. All headers and trimmers to be put in double thick, properly framed and spiked together, leaving all openings of sufficient size for the finish of stairs, chimneys, etc. All headers coming in trimmers to be hung in wrought-iron stirrups, ⅜ x 2½, made so as to be let in flush with top of timber; also, the Carpenter must take all necessary care in framing his work so that important timbers will not require cutting for steam pipes, plumbing pipes, etc., to pass through, but he must properly frame all timbers together, as far as practical, so that the pipes can run between such proper framing.

Cross furr the ceilings of the basement and first and second stories with 1 x 2 inch pine strips, placed 12 inches from centres and well nailed to the underside of every floor joist with 10d. nails.

Prepare, with good and sufficient cradling and furring, for all work that is to be finished by the plasterer.

Bond Timbers. Furnish all bond timbers and wood brick for insertion in walls as necessary for the proper execution of the work; set the curves as before described; also, see that the Mason executes all work properly that the finished carpenter work has to come in contact with and fit, so that at completion it will fit properly, and all be correct in every particular; if any errors appear, the Carpenter must notify the Superintendent before making and putting up his work coming in connection with any mason work not properly done.

Lumber. The lumber to be of white pine, unless otherwise specified; for the outside of the building to be of first quality clear pine.

Inside finishing lumber to be clear and dry, free from sap, shakes, and knots.

Exterior Work. Cover the whole of the roofs with sound matched 1⅛" × 5½" pine boards, placed face side down, and well nailed to every bearing through each edge with 10d. nails. Joints to be properly broken, and the valleys neatly fitted, etc.

Gutters. All boxing to be done as required for metal work of all gutters, and the gutters graded in a proper manner to points indicated for the leader pipes, and the roof boards set over on all gables, dormers, etc., as may be necessary to take the metal work of cornice where there are no gutters.

Roofing. The Carpenter shall frame and construct, according to the several drawings, sections, etc., all roofs in the most thorough manner, and fix all straps, stirrups, socket heads, shoes, bolts, and other irons necessary to fully carry out the work as designed. Put up all supports, braces, etc., from top of attic floor beams for carrying purlins, etc., as shown or as directed. Do all necessary framing as required for dormer windows, ventilators, bell cot, and all openings on roofs as shown on drawings; and provide and fix all rough carpentry necessary to support the projecting eaves of all cornices, gutters, etc.; and do whatever wood work may be necessary in furring, etc., for the galvanized iron and metal work of cornices, etc., as called for by the design, and as required to make a first class job in this respect.

Bell Cot. Do all necessary framing for bell cot, as shown. Arrange a trap door in floor of same, and build and supply strong and permanent ladders for getting up to same; the trap door in floor of the bell cot to be hung and properly secured inside. Ceiling of cot to be ceiled with narrow boards beaded, and the floor properly framed so as to take weight of bell; the Louvre boards under deck floor for ventilation of attic space to be filled in as shown, the boards set firmly in the proper frame work so as to exclude the snow and rain, and to be arranged inside so it can all be closed up tight in winter time (and shut out the drifting snow, etc.), as shown by the drawings, etc., for same. Flag pole to be fit up with rope, pulleys, etc., complete for use.

Vent Shafts. The top of two main ventilation shafts to be roofed over as shown, and arranged similar to other roofs; the wall plates, etc., to be properly anchored down to the walls.

Door Frames. Make all outside door frames in accordance with drawings; jambs rebated to receive the doors. Make all necessary provision for anchoring the jambs to brick or stone work by placing anchors of wood or iron, firmly secured to the back side of jambs, every two feet in height, running well into wall; also furnish all the necessary frames as required for cold-air inlets, ventilator openings, all doors throughout, or other openings needing same, as shown by the drawings. In all cases the jambs to be properly dowelled or let into stone work of sills so as to prevent their being displaced, etc.

Inside door jambs to be made as required by the drawings; transoms, etc., as shown: and the whole substantially secured in position in the best manner possible.

Window Frames. Windows and window frames on the several stories to be of the form, style, and dimensions all to correspond with the drawings or as hereafter described. All frames for brick or stone work to be made in the ordinary manner, with two boxes for sash weights, and to have outside casings, back linings, inner casings, etc., as shown by details to be properly ploughed or rebated for receiving the inside finish, etc. Sills to be 2" thick, worked to shape, as per drawings. Frames for insertion in the inside partition walls to be made for stationary sash as required.

All double hung sash frames are to have 2" noiseless axle pulleys same as sample to be seen at offices of the Board, with enamelled or bronzed faces, and all to have suitable pocket caps secured with screws at lower end of pulley styles

NOTE All pulley styles and parting strips in double hung frames to be of yellow pine.

Transoms. The transom lights on first and second story windows are to be constructed as shown by the drawings for same, and arranged for transom lights to be hung, etc., as hereafter mentioned. The sash to be 1¾" in thickness in all cases, and moulded, etc., and made in the best style known.

Dormers. The dormer frames to be made in the best manner possible, and the Carpenter to make all the necessary wood work required for holding sash, etc., for the support and proper fastening of the galvanized iron work, cornices, etc., and to arrange the top so it can be covered with metal as shown by drawings. The double sash in attic to be hung, etc., same as other windows, and the single sash to be stationary, and all attic sash secured in place with suitable stops, fasteners, etc., as required.

Hanging of Sash. All double sash throughout the building to be hung with the giant metal window sash chain No. 2 over flat grooved pulleys as before named, and to have cast-iron weights and the patent fixtures for attaching chain to the sash and weights; and to be secured at the meeting rails with a heavy black japanned malleable iron Morris sash lock firmly secured to the meeting rails; each lower sash to have bronzed iron sash lifts on lower rail, and the top sashes to have a flush plate, let into top rail of same in centre with which to lower and raise same as required, and the Carpenter to furnish one pole, and attachment to each room for operating these sash.

Transoms. The transom lights in first and second story windows to be hinged at the bottom with 3" wrought fast butts, and to have Wollensak's patent bronzed iron transom opener and lock properly set and secured for a free operation of same, to each.

Door Transoms. Fixtures. Also all the sash transom lights in the building over the single doors to be hinged to top with 3" fast wrought butts, and to have the Wollensak's patent bronzed transom lifter and lock applied to each.

Floors, Lining, etc.—Line the first and second story floors with ⅞ × 6" tongued and grooved sound boards, placed diagonally on joists, and well nailed through the top to same. Place suitable nailing pieces at sides of walls between joists.

Attic. Lay the attic floor with good sound ⅞ × 6" pine flooring, well nailed to joists, filling in all spaces entirely and tight around brick work of walls.

Finished Floors. Before the finished floors are laid on first and second stories the whole of under floors to be covered with two thicknesses of Neponset red rope fabric deafening felt, each breadth overlapping the other 1 inch; on this lay ½ × 2" strips placed over each joist, nailed in a thorough manner to same, on which to lay the finished floor.

The floors of the first and second stories to be laid throughout with 1" × 3" white oak, first quality flooring, well blind-nailed to every joist with tenpenny nails. All joints to be made over bearings only, and the joints levelled off smoothly at completion.

NOTE. (Parts colored blue on the floor plans are where floor is formed with stone by mason, and has no wood work under, etc.)

The plastering to be finished and mason work all done and dry before the finished floors are laid, or any finished joinery is brought into position, or into the building.

Grounds. Put up grounds for the finish of all windows, doors, bases, casings, jambs, wainscots, etc., before plastering. All these grounds to be set perfectly straight, true to a line and plumb, and well nailed to joints of brick work in a substantial manner. The grounds for plastering on face of brick work to be ⅝" thick.

Floors in Warming and Vent Shafts. The spaces in warming and vent shafts at base of same not occupied by the radiators, to be floored over with ⅝" × 6" flooring on 2" × 2" strips laid on the iron joists (put in by warming and ventilating contractor), and the trap doors as shown in each to be properly fitted and hung with 14" wrought-iron T-hinges, and to have rings, etc., to lift same. A short step-ladder to be arranged to each of these trap doors so that one can get down into the cold-air ducts below the radiators, etc., and a short step-ladder 8 to 12 feet long to be supplied in the base of each shaft for janitor's use in going up the shafts, and to reach the iron ladders built into walls; also put up strong and permanent step ladders for getting up into the main vent shafts from floor in attic, as required.

Ceilings of Porches, Stairs, etc. The ceilings of the front and rear porches are to be ceiled on under side beams, etc., with ⅝" × 3½" beaded ceiling of even width, and finished in angles with a 3" × 3" wood moulding, and the plane surface of ceilings to be broken up into panels about 18" square by nailing on 1½" × 2½ strips. The under side of all wood staircases to be ceiled with boards similar to the porches and the ceilings of first floor staircase halls, the latter finished with panels same as the porches.

Stairs. The janitor's stairs from his office to basement, also the two flights from second story to attic floor, one on each end of the building, to be built as shown on the drawings; to have plank strings 1¼" hardwood treads, ⅝" risers all properly housed together and supported, etc., as required, and properly furred, etc., for ceiling under, as before mentioned. The attic stairs to be arranged on top part, where opposite the windows, by boxing the same in about 18" so as not to shut off the light on the stairs below.

Casing, etc. The whole of the doors and windows on the first and second stories are to be cased with 1¼" × 6" beaded casings finished plain (and without base or corner blocks). The top of side casings to run up ¾" above head casing, and the head casing fitted in between same. The joints to be lapped 1" by halving out and letting back of heads in behind the sides, and the whole nailed, etc., in a thorough manner. The edges of jambs to be beaded, and to have a rebate in solid for receiving the doors. The windows to be finished with nosing, stools, and aprons, moulded to intersect with the chalk trough on the wainscoting. The windows to have suitable jambs ploughed and rebated into frames, and the transoms cased, trimmed in all cases as shown by the details and required by the drawings. The jambs to brick walls at door openings to be panelled plain, as shown by the details. The circle head windows in first story school-rooms are to be cased square inside same as other windows, the wide double doors, etc., having circle head to be finished as shown.

Doors. Doors in basement to have proper jambs, casings, etc., as required to hang and secure doors to in a complete manner. All doors to be made in best style throughout, solid moulded rails, styles, and multons, the main entrance and outside doors in all cases to be 2¼" thick; all other inside doors to school-rooms, class-rooms, etc., 2" thick, and to the hat and cloak rooms, and closets, in same, to be 1⅜" thick, and all to be first quality doc-

throughout, hung and fitted in as good style as possible; and all doors over 7 feet high to have three butts each, and all outside and vestibule doors of first and second floors are to swing both ways, and be hung with Jewett's double-action spring butts, said butts to be large enough for the purpose intended, and so as to carry the doors easily without any sagging, or breaking down.

NOTE. Doors to be hung with double-action spring butts are so indicated on plans; the basement outside entrance doors to be hung with single action spring butts; the doors to all water closets on basement floor to be hung likewise; these butts to be Jewett's patent. All other doors throughout to be hung with wrought-iron butts, the 2″ doors to have 4″ × 4½″ loose pin butts, and the doors in hat and cloak rooms to have 3½″ loose pin butts; the other doors throughout not here mentioned to have wrought iron loose pin butts, of suitable and appropriate sizes. All the wrought-iron butts throughout the building to be plain, the loose pin butts with ball pins; and all these butts to be of the Stanley Works manufacture and make, also all wrought-iron butts of every description used in the building to be of make, etc., as above.

Storm Doors. At the front porch main entrance storm doors are to be fitted up, so as to be removed in summer time; these to be in four doors, and to have a post in centre arranged to let into stone work at bottom, and be secured to the transom at top; the transom, frame, and transom sash to be stationary; the doors to be arranged to swing both ways, and to have no fasteners on same; to be hung with spring hinges same as other doors, and to be finished to match same, the four doors and centre post only being the movable part; these doors can be 1¾″ thick.

Wainscot. All the walls of first and second story school-rooms, class-rooms, and main hall, and hat and cloak rooms; the first story wainscot in school-rooms 2'.8″ high, second story in school-rooms 3.0″ high, in main halls 4.0″ high, in hat and cloak rooms 6.0″ high; the bottom end of all wainscot to be let into a rebated shoe, which is to be nailed tightly down to the floors, and the battens of wainscot let down into same 1¼″; the caps to be neatly moulded, and in school and class rooms to have chalk troughs on caps, as shown by details for same; this wainscot to be well nailed to the grounds, and the hall wainscot to have a centre ground; this wainscot stuff to be ⅞″ thick, matched and beaded, and of even widths, not to exceed 4½″ wide, and to be put up in the most substantial manner possible.

Hat and Cloak Rooms. The hat and cloak rooms to be arranged as shown by the plans, to be ceiled up with 1⅛″ × 4½″ matched and beaded plank, to have 4 × 4 posts ploughed for receiving ceiling, these posts to have neat turned ends on top; the bottom, centre, and top rails to be moulded as shown, and the top and bottom rails to be rebated to receive the ends of ceiling, and centre rails put on face side only; the lower rails to be kept 6″ from floor to admit of free circulation of air under same.

Closets. The small closets in each to be fit up in a proper manner with shelves, etc., as required, and the door to same to be properly hung and secured with 3½″ mortise lock, having brass front and striking plate, mineral knobs, and japanned trimmings. Locks to these to be of same make as other locks in the building; also fit up other closets with shelves, hooks, etc., as required for general use, and as directed by Superintendent.

Seats. The seat in each hat and cloak room to be put in as shown, to be 1½″ thick, placed 15″ to 16″ above floor, and firmly secured.

Teachers' Toilet Rooms. The teachers' toilet rooms and water closets to be neatly fitted up, the bowls to be cased up with narrow beaded ceiling, and to have door hung under with 2½″ fast wrought-iron butts, and properly secured with flush mortice latches. Water closets to be fitted up with hard wood, to have 1″ hinged seat, 1″ hinged flap hung with 2½″ heavy wrought brass butts. These water closets to be so fitted up that the wood work can be easily removed at any time. The doors from toilet room to water closet to be hung and secured on inside only with a suitable bolt, so it can be fastened from inside only; and these doors to have a spring on same to keep them closed. The height of toilet rooms to correspond with cloak rooms, and to be open at top. The door to water closet to be 3″ from floor and other part of toilet room to come within 1″ of floors. A drawer to be arranged in connection with each water closet which can run in under the wash bowl just above seat level, and which is to have a suitable pull, etc., complete.

Janitor's Sinks. Water closet, etc., to be fitted up in basement in like manner to teachers' closets; and sinks in basement fitted up with narrow beaded ceiling, doors formed and hinged with 2½ butts, and secured with flush latches. A splash back to be arranged over each 16″ high, neatly capped, etc.

Blackboard and Picture Moulding. A strip of pine 1″ × 3″, moulded, to be put on top of all blackboards in school and class rooms, and a 1″ × 2½″ moulded picture strip to be placed around all the walls of school and class rooms; these strips to be securely nailed to the wall joints and put up in a firm and substantial manner throughout, the painter to have time enough allowed to paint these strips one coat before they are placed in position.

Boys' and Girls' Water Closets. The boys' and girls' water closets in the basement to be fitted up in the best manner possible, seats to be 1½″ thick, partitions between 1½″, and the whole so arranged that it can be easily removed bodily, and an arrangement so placed over seats (made with ceiling boards) so as to prevent standing upon same; the top part of partitions, etc., to be neatly capped, braced, and supported and all wood-work in and around these closets to be put together with brass screws in best style possible.

Drinking Fountains. Are each to be inclosed under with ceiling similar to the wainscoting, and to have small door under so as to get at pipes, etc.; this door to be hinged with ″ fast butts, and secured with flush latch similar to the wash-bowl doors before mentioned.

Frames for Cold-air Inlet Openings. The frames for cold-air inlet openings on each side of the building are to be properly secured in position between stone work, and to be made of plank and covered on the outside with galvanized wire netting; this netting to have meshes about ½″ and to be ½″ wire, firmly secured to frames, and a moulding nailed on same over the edges of netting.

Top Vent Openings. Also cover the Louvre board openings on the top of two main vent shafts on inside with stout galvanized iron netting, so as to prevent the birds getting into same.

Picket Fence in Basement. Build the picket fence across part of the basement as shown by the plans, to have 4 × 6 posts, 2 × 4 rails, 1½ × 3″ pickets, all put up in the most substantial manner; gate to be made as shown, hung with wrought-iron hinges, and secured with hasp staples and padlock.

Teachers' Platforms. In each school and class room a teachers' platform is to be built in size as shown; this to be movable, made light and substantial, having floor laid like unto other floors, the front and sides to be finished with nosing, facia, etc., in a neat manner.

Hardware. All hardware used in this building to be of the best quality of their several kinds.

Transom Lifts and Hinging Butt. The transom lights hung, and to have Wollensak's patent lifters of bronzed iron, as before mentioned.

Butts. The butt hinges and all hinges throughout the building, except brass and spring hinges, to be of wrought iron, as made by Stanley Works of New Britain, Conn.

Spring Hinges. Spring hinges as before, mentioned, and of the kind as selected by the Board, through their Superintendent.

Sash Fasteners, Chain, etc. Sash fasteners, weights, chain pulleys, etc., as before mentioned, and to have sash lifts, pulls, etc., as already specified.

Bolts. All double doors on outside are to have flush sliding bolts at top and bottom; these all to be of wrought iron, as made by Stanley Works, and to be of suitable lengths, sizes, etc., as required for the purposes intended. The double doors from vestibule or side entrance, and from two main staircase halls into main hall, are not to have bolts or locks, but will swing both ways, as shown on the plans, and are to have fixtures as required to keep open back to walls for use in summer time as directed by Superintendent, and also on such doors as swing only one way in basement.

NOTE. Porch doors not to have locks or bolts, but to swing both ways, and be removed in summer time.

Locks. The small closet doors in wardrobes to have 3½″ mortise locks as before named, and the teachers' toilet rooms and other closets to have similar locks, all of which are to be alike and have keys alike, so one key will answer for any. The other doors in the building throughout both front and rear, outside and basement doors (except those swinging both ways and having no locks), to have Russell & Erwin's No. 354 lock, with No. 7 keys.

Front and Outside Door Locks—Basement Bolts. All locks to have brass fronts, bolts, and striking plates, and in addition to the above locks the outside doors of first floor to have Corbin's No. 850 lock with No. 29 keys; and strong heavy wrought-iron bolts to be placed on the inside of all outside basement doors.

Knobs. The outside doors to have 2½″ white porcelain knobs, with porcelain roses and escutcheons. The inside doors to have 2½″ white porcelain knobs, with japanned roses and escutcheons, etc. All spindles to be of wrought iron and in one piece, and the knobs secured to same with screws, etc., in the best style. A knob or pull to be placed on inside of the hat and cloak room doors from main hall, where there is a mortise latch and no lock.

Wardrobe Hooks, etc. The hat and cloak rooms throughout to be fitted up in a complete manner with strong double malleable iron japanned or bronzed hat and coat hooks; each room to have not less than one half gross hooks in same. The teachers' wardrobe or book rooms and hat and cloak rooms in connection with the small class rooms are to be partly fitted with hooks, and partly with shelves, etc., for storage of books, slates, etc., as may be directed by the superintendent, and in a complete and finished manner for the uses intended. The wardrobe hooks to be firmly secured in place on the ceiling or wainscoting with 1 in. screws and not less than 2 screws to each; the hooks to be put on about 9 in. apart, breaking joints with each other and in such shape generally as directed by the superintendent.

Bells. Provide and place in each main hall, also in basement story as directed, 10″ gong bells with wires run from each to the principal's office, and to have pulls, etc., there fitted up in a complete and first-class manner, the wire connections to be of copper run in zinc tubes placed in the heat and vent duct or shaft, and to have the necessary coils, cranks, etc., as needed to a free and easy working of same.

The bell in bell cot on the roof is to be fitted up in a complete manner to swing on a stationary stand placed securely on the deck of same, or hung from ceiling, as may be deemed best; this bell to be selected by the board, and to cost net F. O. B. at Cleveland, O., one hundred (100) dollars; this bell to be paid for by contractor, and to be placed and hung in position in a complete manner all ready for use; the bell rope to be a ¼″ hemp rope carried down into janitor's office on 1st floor, and arranged so bell can be rung from that point: the rope to be carried down in a tube placed in the wall for that purpose, or it may be carried down in the warming and vent shaft at the option of parties placing same in position, and to be supplied with the necessary cranks, coils, springs, turns, etc., as may be required for a free and easy working of the whole, and the entire bell fixtures, rope, etc., to be left in complete working order.

Stair Rails. Iron hand rails made with 1″ wrought-iron pipe to be put up firmly and securely fastened to the walls on both sides (at ends and centres) of all stairs throughout the building, from the basement up to the 2d floor level; the supporting irons or brackets for these to be let into brick work of walls, and soldered to same in a proper manner, and the ends neatly bent round and into the brick work as required to make a first-class job in every respect.

NOTE. Rails to be placed on both sides of the steps in the side entrance vestibule as well as other stairs, and on one side only of the stairs in boiler and coal rooms, janitor's stairs, or where there is a wall on only one side of stairs. Also, furnish any other hardware as may be required to fully complete all carpenter work in a perfect and first-class manner, even though not here mentioned, so as to make everything perfect and finished in a thorough manner when done.

Glass and Glazing. The 8 windows in water closets and 4 windows in basement porch walls to be glazed with heavy hammered plate-glass not less than ¼″ thick. All other windows throughout the basement floor and all borrowed light in same to be glazed with good quality 21 oz. sheet (American) glass.

1st and 2d Floors; Transoms. The windows in 1st and 2d stories to be glazed with first quality clear 21 oz. sheet American or French glass (except the transom lights, which are to be glazed with rolled Scotch cathedral tinted glass in different tints and in lights about 4″ square, having a neat colored border and day light glass around the same; this glass to be set in lead properly puttied and cemented, etc., placed securely in frame-work of sash, braced and stayed, and puttied in the best manner possible.

Head Lights over Doors and Borrowed Lights. The head lights over all inside doors, and all sash on inside for borrowed light, to be glazed with 21 oz. ground sheet glass; the large transom lights over entrance porch and vestibule doors to be glazed with cathedral glass similar to the window transoms, only the lights are to be larger, and set in wooden bars, as shown, etc., by the drawings. The attic windows throughout to be glazed with glass similar to the cellar windows, the whole of the glass to be bedded, bradded, and well puttied, all glass left in a perfect and undamaged state without exception; and the carpenter is to do all the carpenter work in a good, complete, and finished workmanlike manner, etc., as called for by these specifications, or shown by the drawings and their true meaning and intent, and to the entire satisfaction of the Board and their superintendent.

SPECIFICATIONS

for the Painting Work and Materials.

Furnish all materials and perform all labor for the full completion and proper painting of all work in the building. The materials and labor to be of the best description, using the very best white lead and pure linseed oil.

Cover all sap, knots, etc., of wood work with a good coat of strong shellac before priming; putty up all the wood work smoothly after priming, and also before applying last coat.

Paint all the exterior wood and iron work three good coats of C. T. Raynolds & Co.'s mixed paint in the following colors: window and door frames, bell tower and other frames in ventilators, etc., Indian red; all sash throughout on outside, white. Trim the outside of all doors throughout with Indian red and bronze green; the bell tower to be trimmed a little with the bronze green, and the ceiling of bell tower, also the wood ceiling work of all porches and stairways, to be painted a good deep sky blue, the mouldings and angles of same being trimmed same as front and outside doors.

Paint the galvanized iron work of cornices, Crown mouldings, etc., three good coats of paint, and sand them to match the cut-stone trimmings. The flagpole to be neatly trimmed, and the ball on top gilded with gold leaf. The tin work of porch roofs, gutters, flashings, valleys, etc., to have two good coats of best metallic roof paint. The galvanized-iron rain-water conductors to have two coats of Indian-red color. All the outside work of every description that it is customary and usual to paint is to be painted in a thorough and workmanlike manner.

Inside Work. All inside wood work, etc., to have two good coats of best lead and oil paint (except the basement, which is to have three coats), and the first and second stories to be grained oak over the second coat, the graining to be done in good style and neatly and artistically executed, and all to have one good coat of Pratt & Lambert's No. 28 preservative (after it is grained) properly applied. All iron doors to vent shafts and other iron work in the building throughout is to be painted in all cases to match the wood work adjoining.

Floors. The oak floors of first and second floors are to have two good coats of hot linseed oil properly applied when the floors are in a good clean and dry state. The attic doors and windows and inside wood work of vent shafts at top of same are to have two coats of paint.

The insides of all hat and cloak rooms to be grained, etc., same as other work on the two main floors.

The water closets for boys and girls, and wood work in these parts, to be well painted, and all iron work painted in a good and first class manner, and all the work in basement to be done in a first-class manner. The painter to see that all wood work is finished before painting, to putty up all nail heads and other defects, to sand paper and properly prepare all work before applying the second and last coats. All graining work to be of the best kind, and the whole of the painter's work to be done in the best and most thorough workmanlike manner known to the painting trade, and all paint or varnish spots cleaned off glass, floors and walls at completion of the work, and all work left in a perfect and complete state without exception, and the work to be done to the full and entire satisfaction of the Board and their Superintendent.

SPECIFICATIONS

for the Tinning and Galvanized Iron Work required in the Erection of a Two-story and Basement Brick Public School Building for the Board of Education of the City of Cleveland, Ohio, as per Plans, etc., by Palliser, Palliser & Co., Architects, 24 E. 42d Street, New York City.

Tinning. Cover the porch roofs, bell-cot deck, line all gutters, valleys, etc., with "Old Style" genuine, stamped guaranteed roofing tin, well secured, soldered in rosin, and put on in the best manner possible. In lining the gutters the tin must be run under the slate not less than 6″, and the tin work brought over the face and soldered to iron work of cornices, or tacked down smoothly as required. Do all necessary tin work as required on roofs, behind dormers, battlement walls, valleys, and other places requiring tinning, so as to throw water into the gutters, and run the tin work up under the slate in a proper and first-class manner so as to insure a perfectly tight job. The tin work of porch roofs to be turned up at sides of walls and step flashed and capped, etc., in a proper manner, the cap of flashings to be turned and neatly pointed into the wall joints, and all flashings or tin work throughout coming in contact with the brick work to be properly flashed and pointed into the joints, etc., of same with slater's cement in a proper and first-class manner. The tops of the galvanized iron dormer windows to be covered with tin in like manner to other parts that are tinned.

Flashings. The tinner to furnish the carpenter all necessary painted tin flashings to enable him to thoroughly flash all outside work of every kind needing same to make perfect and thoroughly tight work, and the tinner to look carefully over his work after other workmen are through, to stop all leaks and leave everything tight.

Valleys. The valleys of main roof all to be lined with tin 28″ wide, properly laid and secured; and all tin flashings, valleys, etc., to have two good coats of metallic paint on under side before laying, and on top before being covered up with other work; this to be done by the tinner.

Galvanized Iron Cornices, Mouldings, etc. The main cornices, ventilator and bell-cot cornices, crown mouldings, etc., to be of galvanized iron, and of the heaviest iron that can be used for the purpose intended. These cornices, mouldings, etc., to be securely fastened in position to the wood furrings, etc., prepared by the carpenter and properly soldered to tin work of gutters or tin flashings, etc., in connection with same.

Dormers. The faces and cornices of the circle and circle head dormer windows to be made of galvanized iron; also the ridge cresting and ornamentation, etc., on same; and the whole placed and secured to the wood work, etc., in a proper manner, and all the requisite arrangements for flashing and lapping over slate to be done as needed to make perfectly tight in every respect.

NOTE. All the cornices and crown mouldings on the top part of the building above second story are of iron, there being no wood cornices on the exterior of the building whatever.

Finials. The four large finials on hips, etc., of main roof to have galvanized iron bases, etc., and the finials over to be of iron as shown by the drawings; these to be secured to roof in a proper manner by running a bolt down through wood work, and having a nut on under side. Also the base of flagpole to be made with galvanized iron, as shown by drawings for same, and properly secured in position. All the galvanized iron work to be riveted together as well as soldered at joints, and to be of best kind of work known to the trade.

NOTE. All cresting on main ridges of roof is terra cotta, put on by Slater.

Leaders. Put up where indicated on plans (roof or basement plans) the necessary number of galvanized-iron expanding water conductors of Irwin & Reber's patent, made by S. S. S. Conductor Co., Allegheny, Pa., the 12 conductors from main roof to be not less than 4½″ in size, and those from porch roofs 3″ in size; to be of extra heavy iron; to have all necessary curves, bends, breaks, etc., to convey the water from the gutters to the grade level, and there connect them with drain pipe in ground. All joints to be lapped and soldered tightly together. Secure the leaders to the building with galvanized iron boldfasts, and place a galvanized iron wire-screen over all openings in the gutters. All breaks and bends to be made and curved on a proper, neat, and close sweep around the set-offs and breaks of the building, and all elbows to be made in like manner.

NOTE. In all cases the lower ends of the leader pipes for a distance of 5′ 0″ up, to be of cast iron, well painted, properly secured, and the connections made with galvanized iron and drains in the best manner possible.

Speaking Tubes. Furnish and fit up with mouthpieces and whistles on each end complete, and prove them tight, the following speaking-tubes: One from every school and class room in the building to janitor's office; one from the principal's office to the boiler room in basement, as well as to janitor's office. As far as practical, these speaking-tubes to be carried in the warming and vent shafts, and are in all cases to be placed in position out of sight, and so that they will not pull apart or be liable to get out of order.

Lining of Floors in Base of Warming and Vent Shafts. The floor space at base of warming and ventilation shafts not occupied by the radiators to be covered with galvanized iron (the space being previously boarded by the Carpenter), well-fitted joints lapped and soldered, and under this lining on top of the boards to be underlaid with asbestos sheathing felt properly laid, lapped and tacked down, the iron lining of these parts, etc., to cover the small trap doors, and to be so arranged that the warming and ventilating contractor can place in his casings around radiators, etc., without interfering with floor linings.

NOTE. All other tin and galvanized-iron work in warming and vent shafts, and in connection with the warming and ventilating, will be done by the warming and ventilating contractor.

Summary. The entire tinning and galvanized iron work to be done up in a strictly first class manner, and all work left in a perfect and finished state in every particular, and done to the full satisfaction of the Board and their Superintendent.

SPECIFICATIONS
for Slater's Work and Materials.

Cover all the main roofs of the building with best selected heavy Bangor black (Penna.) slate, 9 inches by 18 inches in size, laid with a lap of at least 3 inches of the third over the first, the slates to be properly drilled and trimmed, each slate to be nailed with two galvanized iron nails; all nails to be covered up. The slate at hips, valleys, eaves, and heading course to be cut so that their bond will be uniform with the rest. All hips to be mitred and put together in slater's cement, unless otherwise directed or specified. All top ends of upper course of slate under ridge covering to be firmly bedded in slater's cement.

When hips are too flat to be mitred, to have a hip roll covered with zinc. Vertical sides or cheeks of all dormers to be slated as far as practical.

Felting. Previous to laying slate, cover all the roofs with Neponset black felt paper, carefully stretched, lapped, and tacked on.

Flashing. Do all necessary flashing as required around all dormers, vent shafts, bell cot, angles of walls, side walls, and all other places requiring flashings, with heavy zinc of full width, and properly placed and secured in position; step flashing such parts as are necessary, and cap same where exposed in like manner to chimneys. Flash all hips requiring same with heavy zinc of full width, and cover rolls with zinc as prepared. Flash the chimneys with zinc; step flash those on the rake of the roof; cap the flashing with zinc and turn the cap into the mortar joint, and point the brick work and secure with slater's cement. The flashing to extend perpendicularly under the cap and terminate; the cap, which is secured in the brick joint, to follow down plumb to within a half inch of the slate and there stop.

Aprons of zinc to be put in at the top end of lower section of roofs coming up against vertical walls or roofs of different pitch above, to be 12 inches in width; and where they come in connection with masonry, the cap to be chased into walls 2 inches, and secured same as chimney flashings. The hip and ridge metal coverings to be properly braced and strapped every 3 feet with galvanized iron straps firmly secured to the furring. Fillet into masonry for the slating where required, and secure slate properly in fillets with slater's cement.

NOTE. The valleys are to be slated open, and will be put in by tinner.

Terra Cotta Cresting. Furnish and set terra cotta ridge crest in style and where shown by the drawings; to be buff in color and best quality; straight, true and even; to saddle the ridge of roof and lap 7 inches on each side; firmly bed all ridge crest in good hair mortar; put all the joints together and make perfectly tight with Portland cement colored to match color of crest, and properly wash off at completion and leave slate clean.

NOTE. *Iron Cresting.* The four large iron finials and their bases will be supplied and set by the tin and galvanized iron contractor, the Slater to assist in setting, and to see that his work is all right to come in connection with them.

At the close of the works carefully examine and perfectly make good the whole of the slate or other works mentioned under the head of slating, and warrant the work, and keep same in repair for a period not exceeding two years from time of completion, the work all to be done in the best manner, and to the full satisfaction of the Board and their Superintendent.

SPECIFICATIONS
for the Plumbers' and Gasfitters' Work and Materials.

Furnish all materials and perform all labor requisite and necessary for putting up and completing all the plumbing work in a good and thorough workman like manner, according to the drawings and these specifications and their full intent and meaning. Where the specifications vary or conflict with the drawings, the contractor is to be governed by the specifications.

Strips, Cutting, etc. All water-service pipes must be put up on inch-thick stripping, or in cases to be prepared by the carpenter, and all to be so put in that they can be readily got at at any time for examination; no pipes to run on outside walls. Neither must the plumber cut any timbers, as this will be done by carpenter, and he shall not cut any to weaken them.

Brass Ferrules. All lead pipes to be secured with hard metal tacks and screws, and all lead wastes or ventilating connections to iron pipes to be made through brass ferrules, which must be soldered to the lead pipes and caulked with oakum into the iron hub, and the joints run with molten lead.

Protecting Pipes from Frost. All exposed places of water pipes, or any pipes containing water that is liable to freeze, must be thoroughly packed with mineral wool or asbestos properly boxed and cased in to the full satisfaction of the Superintendent.

Safes, Wastes, Strainers. There must be safes placed under all basins, water closets, or fountains, above the basement floor, the sizes of spaces occupied, of 4-lb. sheet lead turned up 2″ all round; and to have separate 1″ lead waste pipes, with 1½″ convex strainer from each, to run to basement direct; and to have ends open just below ceiling, where the janitor can see them plainly and so that they will drip clear of the brick or other walls in basement.

Water Supply. Tap and pay for tapping main in street. Connect, and from this point lay 2-inch heavy galvanized-iron pipe to supply the building. Place a round-way lever-handle stop cock at a convenient point where out of the way, so as to shut off the water when necessary. Run this pipe 2″ in size into the centre part of basement (water main to be brought in about centre of building on side and near janitor's room), and there connect with 1½-inch pipe running both ways to front and rear of the building, taking out the necessary branches ¾″ in size for supplying the water fixtures, etc., in the centre part of the building, as required, the 1½″ pipes to run into the boys' and girls' water closets for supply to same. Also run a 1″ branch galvanized pipe from 2″ main into the boiler room, and leave in a convenient location for warming and ventilating contractor to connect for boiler's supply.

Stop Cocks. Each branch line of supply pipe to have a separate stop cock in basement controlling same, and care must be taken in grading all pipes so that when the water is turned off they will be drained dry and the water emptied from the pipes be carried into sink, bowl, or such other article as may have connection with sewer and trap between waste and same; and the plumber to furnish and put in all stop cocks as may be deemed necessary by Superintendent to make a first-class job, and to shut off any part of the work separate from the rest, as it is the intention to have it so arranged that any part or single line can be shut off without interfering with another.

Iron Soil, Waste, and Drain Pipes. Connect with the two catch basins at each end of the building 6″ cast-iron pipes, these to continue to points as required for connections to the latrines. Run all necessary branches of 2″, 3″, and 4″ pipe from this point as required for all the other connections in the building; the urinals to have 3″ connections, sinks and drinking fountains 2″, other water closets 4″, and run from these soil pipes or drains 6 lines of 4″ vent pipes, which are to be carried up to 10 feet above level of attic, floor 4 of them in the vent flues from boys' and girls' water closets, and 2 in the large or main ventilation ducts; the 2 latter are to run up high enough so as to turn with a one-quarter bend and pass through to outside of brick work above roof, and be there covered with a galvanized-iron wire screen, the ends of the other 4 to be left open in the flues. The pipes in the ground throughout the basement floor, and for all the different fixture connections, to be of iron, and all to be laid by the plumber as shown; to be put on a proper grade, so they will all drain out properly to catch basins, etc.; and to run as required for proper connections to all the different plumbing fixtures in the building; all horizontal and vertical pipe connections to be made with Y branches and one-eighth bends: all cast-iron pipes throughout to be Mott's extra-heavy soil pipe and fittings, tar coated and enamelled, properly laid, supported, and secured with large iron hooks, braces, or hangers; all joints caulked with oakum, and run with molten lead. And when the pipes have been put in, and while they can all be seen, the contractor is to plug up all openings of waste and vent pipes, fill the same with water from the highest point, leave full for one day so Superintendent can see if tight, and if any leaks appear the same must be made tight.

Latrines. Furnish and fit up complete, as shown on plans, 4 rows of Mott's latrines of cast iron, painted and enamelled, with brass fans and couplings, and supplied with Demarest's patent valve sections, to have 1¼″ double A lead or galvanized iron supply pipes and ½″ branches; each to waste through 6″ cast-iron pipe, properly trapped and connected with iron drains as shown; the valve sections to be put in and so arranged that they can be cased up, locked, etc., and only accessible to the janitor; each seat to be of hard wood, hinged, and the whole wood work arranged so it can be easily moved. The carpenter will do the wood work, and the plumber to see that it is so fitted that he can at any time get at his work for repairs, etc; these latrines to be fitted up in the best manner possible and perfect in every respect.

Water Closets. Furnish, and set as shown on the plans, five No. 2 B Demarest's water closets, with galvanized cast iron cisterns, patent urinal slop safes, and connected with the 4″ cast-iron soil pipes in the best manner possible; a shut-off cock to be placed on supplies to each water closet, so that the same can be shut off without interfering with the supply to bowls, etc.

Wash Bowls. The four wash bowls to have white marble countersunk tops with moulded edges, backs 10″ high, moulded; bowls 14″ in diameter, of Wedgwood ware, with patent overflow connections; to have water through ½″ double A lead pipe, ½″ nickel-plated Broughton's self-closing basin bibbs, plated plugs, chain, and chain-stays, and 1½″ heavy lead waste, with 1¼″ Bower's traps under each and properly connected into Y branch of soil pipe.

Sinks. The sink for janitor's use to be of cast iron, galvanized; size as shown on plans; supplied with water through ½″ galvanized-iron pipe, nickel-plated (brass) draw cock; and to have 1½″ heavy lead waste, 1¼″ Bower's trap, and the waste properly connected to the iron waste.

Sinks in Water Closets. The small sinks in boys' and girls' water closets to be Mott's cast-iron sinks with plug, strainer, and overflow, galvanized, as shown in Plate 3, Mott's catalogue; supplied with water through ½″ galvanized iron pipe, ½″ nickel-plated Broughton's patent self-closing bibbs; to have 1¼″ heavy lead wastes, 1¼″ Bower's traps, and properly connected to iron wastes or drains.

Urinals. The four urinals in boys' water closets to be fit up as indicated by plans, and to be Mott's cast-iron galvanized sectional urinals, supplied with water through a ½″ galvanized-iron pierced pipe running lengthways of same and secured to backs, and each having a stop cock, placed well out of reach, so janitor can control same; outlets to be 2″, and to be trapped with S-trap having brass trap screw, brass strainers to the outlets. These urinals to be fitted up in the best manner possible and complete in all particulars.

Cesspools in Water Closet. The four cesspools in the water-closet floors to be as shown in Plate 52, Mott's catalogue; 9″ square, with bell traps and 3″ outlets, properly connected to the 3″ drain below (which is put in by mason, and who is to bring the pipe up within 10″ of water-closet floor) in a suitable and first-class manner.

Hose Connections. A connection for hose attachment to be placed in each boys' and girls' water closet, also in the boiler-room or near thereto, these connections to be for 1″ pipe, and to have all the necessary valves, etc., as required to make a strictly first-class job; the valves, etc., to be placed or so arranged that they are entirely controlled by the janitor. Also furnish 75 feet of three-ply rubber hose, with all necessary fixtures and connections.

Fresh-air Inlet Openings. The 5″ fresh-air inlet openings to be connected as shown by the plans; these to be of cast-iron pipe similar to the other soil pipes, and to run up 4.6″ above ground level, and be there capped with a perforated cap; and the top end of the pipe for 1 foot down to be perforated with ½″ holes enough to give a space or opening the size of pipe for admission of fresh air.

Drinking Fountains. The 6 drinking fountains in the 3 floors as shown to be of cast iron enamelled, to fit snugly in the recesses of walls, and to have backs 8″ high, neatly moulded, each supplied with water through ½″ galvanized-iron pipe, and to have nickel-plated Broughton's patent self-closing bibbs; wastes to be 1″ heavy lead, with Bower's traps, etc., properly connected to the iron drain pipe; the trap, waste, etc., to be concealed by the wainscoting, finish, or casing, under which is to be hinged, etc., by carpenter; so the cast-iron fountains will have to be placed on top of this wood work, and are not intended to project over more than about 4″ in the centre part.

Bibbs. All the bibbs throughout the building, as far as practicable, are to be self-closing work of Broughton's patent, as made by the E. Stebbins Mfg. Co., Brightwood, Mass.; and all stops or wastes to be of brass of the best kind and quality made for the purposes intended, and put in in such positions that they are under the control of janitor only, being either boxed and enclosed, or placed where the children cannot reach them; and as many stop and waste cocks to be put in as may be deemed necessary by the Superintendent to make a strictly first-class job in every respect, and to control any single separate piece of plumbing or set of fixtures without shutting off any other.

The whole of the plumbing, pipes, etc., to be run up the inside of the warming and ventilation shafts as far as possible and practicable; but care must be taken not to have any water pipes or any pipes holding water in the cold-air spaces under the floors of warming and ventilation shafts; the pipes in the shafts to be placed on the walls and firmly secured to same in best style possible. All traps used in and throughout the building, as far as practicable, if not otherwise specified, are to be Bower's patent traps, of best kinds for the purposes intended; and in all cases ample provision to be made so all traps can be easily got at to clean out, etc.; and to have the necessary arrangements for this purpose, all trap screws being of brass.

The entire plumbing work in the building to be of the very best kind, the fixtures and work being of the best description of their several kinds, as specified, and all the different fixtures, as shown on plans, to be fit up in a complete and first-class manner, even though not here specified, and the whole of the pipes and traps ventilated thoroughly, as required, to insure all against siphonage; and such ventilation pipes as put in to be of lead or wrought iron, and connected into the soil vents not less than 2 feet above the highest waste connection.

Gas Piping. Use best wrought-iron gas piping of the various sizes required; the mains to be run as direct as possible, and so graded that any water gathering in pipes can be run out at a convenient point near the meter; no pipe to be less than ¾″ for fixture connections.

Secure all piping substantially in place with iron holdfasts, and secure the drop and other outlets with galvanized-iron straps and screws; the pipes to be run to supply burners where indicated by checks (thus— V gas—for side lights, and for drop lights thus—× gas) on plans, or as directed by Superintendent; the side-wall bracket connections to be arranged so as to project from finished wall the proper distance for same, and pipe ends for drop lights to hang and set perfectly straight and plumb.

The gas pipes to be put in as required by the rules and regulations of gas company. Put the joints together in red lead; all pipes to be capped, proven tight, and caps left on. Locate meter as indicated on plans; provide all necessary shut-offs and alcohol cocks, and make a perfect job.

The gaspiper must not cut any timbers: this will be done by the carpenter; timbers not to be cut except where strictly necessary; no timbers to be cut through centre of span, but may be close to bearings.

All gas outlets to be supplied with neat (iron) bronzed fixtures, lava tips or burners, and all connections made to street mains, meter, etc., as required, and all left ready for lighting at completion.

SPECIFICATIONS
concerning the Materials to be furnished and the Work to be done in the Warming by Low-pressure Steam Warming Apparatus, and the Ventilating Work and Materials as required in a New Two-story and Basement Brick and Stone Public Grammar School Building to be erected at Cleveland, Ohio, for the Board of Education, according to Plans, etc., made by Palliser, Palliser & Co., Architects, 24 E. 42d Street, New York City.

Conditions.

All the materials used and furnished throughout this work are to be the best of their several kinds, and all work done in a thorough, substantial, and complete manner, and the perfect operation of the whole guaranteed and done to the acceptance and satisfaction of the Architects, the Board and their Superintendent.

Boilers. Furnish three boilers set and placed as shown by the plans—two large ones for general warming and other purposes, and the small one for summer ventilation only; the two large boilers to be horizontal-return thoroughly constructed tubular boilers, with their shells 54″ in diameter, total length 16 feet, smoke chambers being a continuation of shells; to have 62 best wrought-iron lap-welded tubes to each boiler, of 3″ diameter and 15 feet long; to be an 11 × 15″ manhole in the top of each boiler, with saddle on top of shells.

The shells to be of charcoal hammered No. 1 iron, $\frac{5}{16}$″ thick, stamped with a tensile strength of 50,000 pounds per square inch; heads to be of the best flange iron, ½″ thick; four plates over fire to be of best homogeneous steel plates, $\frac{5}{16}$″ thick; domes on shells where the pipes are taken off to be 30″ in diameter and 26″ high, with thickening plates where steam pipes are screwed in; The tube heads to have hand holes and plates at each end of the boilers, and be strongly braced with wrought-iron braces of first quality; on the rear head 3″ angle iron to be riveted for return plate.

The boilers to be riveted in the best manner, and chipped and caulked, and tested to 140 lbs. hydrostatic pressure per square inch, and a certificate of this by some responsible steam-boiler inspection and insurance company to accompany boilers.

Drill and tap all the necessary holes in the shells for gauges, valves, piping, etc.; properly adjust in the connecting breechings a damper with crank connections; support the boilers by three cast-iron brackets on each side, to have 6 rivets in each, and the brackets to be long enough to rest on the walls 10″; cast-iron plates 12″ square and 1″ thick to be placed under each bracket and plate; the smoke chamber to be 14″ deep and with hole for smoke of proper area, and the connection to flue beyond to be of $\frac{3}{16}$″ iron and of area equal to the area of all the tubes in the boiler, or each smoke flue of iron to be not less than 22″ in diameter, made and put up as afterwards herein described.

Boiler Furniture and Castings. Provide furnace fronts of suitable thickness, of smooth casting, and properly fitted with flue doors having an inside fire lining of 1½″ boiler iron, making an air space between the doors and linings; the furnace fronts also to be fitted with fire doors and ash-pit doors—the fire doors to be lined with perforated air lining and fitted with register wheels, the ash-pit doors to have a wheel but no lining—all the doors to be well fitted and properly hinged and latched. Provide in fronts for three ¾″ gauge cocks, and one ¾″ water gauge, 16″ from centre to centre: one dead plate 1¼″ thick to fit each front and extend to the tube sheets and rest on the walls 6″ on each side; to be one bar beam for the front and one for the back, both of proper weight and having a bearing surface on the walls 6″ × 6″. Provide a set of grates 56″ long by 60″ wide, and with ½″ openings to each. Also provide to each boiler 2 wall boxes, fitted with doors and anchors to hold the door frame in position; also to each 6 wall binders and bolts and 6 anchor bolts to extend from the front to rear of mason work, with heavy cast-iron washers; also a return-flue plate bolted to the angle irons, to be 1″ thick, extending over the opening and on to the rear walls 6″.

Furnish to each boiler one 8″ brass case steam gauge; supply boiler grates of each boiler with a hot-blast air draught, to come from the top of the foul-air shafts through 16″ air-supply pipe connected to same and run to the draught door of each furnace box; this pipe to be 16″ in diameter (No. 18 iron galvanized), and to come from above coil in the shaft with goose neck, so as to take warm air for boiler supply from above coils, etc., and to run down along side walls, and properly secured to same. Furnish and supply a perforated inverted V-shaped cast-iron bridge-wall capping, to measure 8″ on each side, ¾″ thick, and to have a pipe connection made with the hot-air blast from the foul-air shaft for the purpose of thoroughly igniting the gases at the point of escape from fire box. Also furnish to each boiler one ¾″ water-gauge glass 16″ long, three ¾″ register patent gauge cocks, one water column, one 2″ Crosby prop safety valve, one Norcross steam-damper regulator, large pattern, to work the damper in the breeching. Put in two blow-off cocks, and all other valves, cocks, etc., necessary for proper completion of the boilers; blow-offs from boilers to go into an open hopper connected into sewer, etc., in boiler room; boiler fire boxes of sizes before named to have Williams's patent grate bars.

Fire Tools. Provide a flue scraper, hoe, scoop, slice, bar, and rake, and such other tools as may be requisite and necessary to a complete and proper management of the entire apparatus.

Small Boiler for Summer Ventilation. The small boiler for use in the summer ventilation to be either a horizontal tubular or vertical tubular boiler of ten horse power, made in all respects as good as specified for the larger ones, and supplied with every improvement same as above that is necessary or tending to an economical management of the same; this boiler to have suitable dome, smoke connections, and all other connections complete, and the special necessary tools for management of this to be furnished in addition to those already named; the weight, etc., of iron in shell to be same in this boiler as in larger ones as far as it is practicable to make it so, and to be a first-class boiler in every respect.

Each boiler to be connected to a 2″ stand pipe from bottom of boilers, to be put in properly, and which is to run up seventy-five or eighty feet above the water line of boilers; this pipe to run up in the foul-air shaft up to top, so it can turn outside of wall and empty on roof at a convenient point; the necessary check valves from boilers to be put in as required to prevent water backing from one boiler into the other; and all the connections made in a suitable and first-class manner.

Masonry of Boilers. The mason contractor on the building under his contract has to do all the necessary mason work as required in the setting of boilers, and the warming and ventilating contractor is to furnish him all

necessary plans for same, to superintend the work and see that the following specification is complied with by the mason in respect to this part of the work: Put in good stone footings laid in cement under brick walls. Build the two side walls and rear walls with best hard-burned brick, laid in cement mortar of best kind, of the usual proportions for setting boilers; to be a double 8″ wall with 4″ air space, making 20″ through all to each boiler. Carry up each wall to height of centre of boiler fronts, arch over with the same kind of brick laid on edge the lap of boilers, and have them well grouted and covered with cement, leaving an upper air space on top of the wall between boilers; bridge walls to be 20″ thick; furnace and bridge walls to be lined with first quality No. 1 fire brick laid in fire mortar and have closely rubbed joints; the mason to properly connect the boilers to the smoke flue. Pave the entire space under the boilers with hard-burned brick, well grouted and laid solid; and the mason to do all other mason work as required in the setting and placing of boilers, both the two large and the small one, as directed by and under supervision of the warming and ventilating contractor.

Smoke Flues. Furnish and put up two plate-iron smoke pipes—horizontal parts over 20 ft. in length 24″ in diameter, and vertical parts and balance 22″ in diameter—to be made of best quality No. 12 thick plate iron thoroughly riveted on the horizontal and longitudinal seams of each section, about 10 ft. each, and carried from foundations prepared by mason at basement-floor level up to the top part of the warming and ventilation shafts, and there connect with the brick chimneys provided for that purpose; these pipes to be thoroughly braced, stayed, and anchored in position between the brick walls, and in all cases to stand clear of the walls and as near the centre of shafts as practicable; the curves and bends to be made in these pipes as required for an easy and free working and management of the same, and as required to suit the mason work of the shafts; the connections of the horizontal pipes to be made in a proper and first-class manner, and these pipes to have a proper base connection to boilers and to be hung and supported from the ceiling with stout iron chains, yokes, or hangers, in the best style possible; the smoke pipe from the small boiler for summer use to be 10″ in diameter and to be connected with the large horizontal pipe from large boiler in a suitable manner; the necessary openings as required in smoke flues, etc., to be made for cleaning same as may be deemed necessary by the contractor and the Superintendent.

Plumbing. Water-feed connections for the boilers are to be made by the warming and ventilating contractor from the water system of the building (which is conveniently located for this purpose).

Piping. Start from each boiler dome with 6″ main steam-supply pipes, and turn the two 6″ pipes into one 8″ pipe for main supply from the two large boilers. Carry the 8″ pipe from the boiler-room to main hallway or centre of basement, and there branch into two 6″ pipes, running one towards each end of the building to a point between the two warm-air chambers, and branch these 6″ pipes into two 4″ pipes, passing same into each warm-air chamber for general supply of the indirect radiators, etc., contained therein. From point where the 4″ connections branch from the 6″ main, run a 3″ pipe to supply water-closet coils and the steam pipes running up flues in same, taking out the necessary branches to supply the foot-warming plates, etc., on floors above; 1½″ steam and return pipes to be carried up the four ventilation flues of the water closets, these pipes to run up not less than 10 feet above the attic floor and to be properly secured in position to the brick work with suitable iron anchors, holdfasts, etc., as required; the necessary branch feed pipes of 1¼″ to be run from the mains in water closets to feed the coils in same, and suitable provision to be made for shutting off these coil feed pipes close to the vent-flue pipes, so that the smallest amount of live steam pipe possible will be in use in the rooms, etc., of the building when the small boiler is running in summer time for ventilation only.

A 2″ branch to be taken out of the end of 8″ main at centre of basement for supply of the four foot warmers in first-story main hall floor and the direct radiator which is placed in janitor's office (under the window) on this floor, and the necessary connections to these points to be made from this 2″ pipe as required; separate 1¼″ feed pipes, with 2″ horizontal feeds, to be run up two of the foul-air shafts to supply the 600 ft. of 1″ pipe coils at top of each, at the intersection of the two shafts into one, and these feed pipes to be run direct up shafts for this purpose only and to start from as near the base of shaft as possible, on account of having to be connected with small boiler for summer use only.

Return Pipes. 1¼″ return pipes to be put in from the two coils at top of vent shafts, and 1¼″ returns from the four lines of pipes running up ventilation flues in the water closets; these return pipes to be arranged separate from balance of returns, and brought back and connected to main drip pipe to large boilers, also to drip pipe into small boiler at convenient points; the two 1¼″ returns to branch into 1¼″, and the two 1¼″ from each end of building into 2″ pipe, properly connected to both large and small boilers, as before mentioned, and having valves to close either connection as required to suit either boiler that may be running; 1¼″ main returns to be brought back from the water closet coils, and 1¼″ branch returns connected with same direct from coils; these 1¼″ returns to connect with 3″ branch returns from each warm-air chamber, and the two 3″ from each chamber to run into four main returns back to the boilers and to have 5″ main return and 4″ branch returns to each large boiler; and all return pipes from radiators, and all pipes in the building, to be connected in a good and proper manner with the least amount of pipe possible, and so arranged that there will be no traps in the same; all relief and return pipes to be connected to main returns below the water line of boilers, each coil and radiator having separate return pipes run down below water line of boilers, so as to be entirely independent of each other. The foot warmers can be run two into one main, so that, where three are located together, two or one can be shut off as required.

Relief Pipes. Relief pipes to be connected with all feed pipes where there is any liability to collect water in same from condensation; these pipes to be ¾″ in size and to be properly connected to the return pipes back to boilers at a suitable and convenient point, so as to let out any such water; and all steam and return pipes in the building to be properly arranged, so they can be used with either one or the two large boilers, either singly or together, and to have all necessary open-way check valves as needed for proper operation of the same; and the feed and return pipes to and from the two coils in top of the foul-air shafts, and the four pipes running up the four ventilation flues from boys' and girls' water closets, to be arranged with all necessary open-way valves, reliefs, etc., needed for a proper and free working of the same with either one or both the large boilers, or the small boiler for summer use only; and open-way check valves to be put in all pipes as required, to prevent the water backing from one boiler into the other; and a relief drip pipe ¾″ in size to be put in each main steam pipe just outside the steam valves connected to return pipe back to boiler, so as to let out condensation when only one or both of the boilers are in use.

Radiators. The whole of the radiators for all purposes in the building to be of wrought-iron pipe 1″ in size internal diameter, and to be put together in the best manner possible; the indirect radiators in the four chambers to be carried on 5″ light I beams placed so that each stack will rest over 2 beams, and to have a bearing of 4″ on side walls; and all pipes in these radiators to be placed staggering in one pipe, not directly under the layer above, but under every alternate layer, so that the air in passing up through will come in direct contact with all the steam pipes; and all pipes in the indirect radiators to have chairs of cast iron placed between same, so as to keep all pipes firmly in position.

The indirect radiators in the four chambers to each be made in three sections, each section having its own separate 1¼″ feed and 1¼″ return pipe, with open-way gate valves to control each separately, and properly connected to the main feed and returns; these sections to be each kept 5″ to 6″ from each other, so as to allow a freer circulation of air among pipes. These indirect radiators are all to be enclosed in No. 24 galvanized iron jackets or casings, with a suitable space in top over the steam pipes; and the tops of these jackets to be made loose, being arranged to drop the same into a groove formed on the sides, and to have a sand joint; and the front of each jacket to also be arranged with joints peaned together, so that the front and top of casings can be easily removed at any time to get at the steam pipes, and replaced without any damage to the same.

Connections. All connections to hot air pipes to be arranged from these jackets in a suitable manner, by having collars properly riveted and secured to top of same as required.

NOTE. For size of pipes from jackets or casings around the indirect radiators, and the number of feet-warming surface or pipes to each stack, reference is made to the schedule here annexed, giving all the sizes and number of ft., etc., to be put in the different parts of the building, also sizes of all registers both for hot air and ventilation purposes.

Coils in Foul-air Shafts. The coils in top of each foul-air shaft at and above intersection of the two are to contain each 600 feet of 1″ iron pipe, to be properly supported on rolled I beams placed in brick work and having a proper bearing on same; these coils to be made so as to go around the four sides of the shafts' and placed, 6 or 8″ from walls of same for heating purposes, and to be well hung and firmly secured in position, braced and stayed, etc., as required.

Coils in Boys' and Girls' Water Closets. The boys' and giris' water closets each to have two coils of 1″ pipe, each containing 67 linear feet properly secured in position on the side walls, with proper and suitable irons, and to be placed on opposite sides of same on outer walls in a good and convenient position; these to be arranged with feed and return pipes, as before mentioned, and to be entirely independent of the pipes running up the flues for ventilation purposes.

Foot Warmers. The foot warmers on 1st and 2d floors are each to contain 30 feet of warming surface or 90 feet of 1″ pipe, and are to have 1″ feed and ¾″ return pipes, and each foot warmer to have separate valves controlling same; these pipes to be contained in a tin-lined pocket graded properly and to have a ½″ pipe from same running down to basement floor and let open at some convenient point, so janitor can see the same; this to carry away any leakage from steam pipes and to show same plainly; the top covering of these foot warmers to be of perforated cast-iron plates ½″ thick, checked tops, and to have an opening in one end for hand hole to get at valves, etc.; size of these plates to be 16″×98″ and to be securely fastened down to the floors flush with screws; and the hand-hole plate to be secured in a proper manner, so as to be easily opened or closed to operate the valves; the tin work and lining around these foot warmers to be neatly painted on inside, and the cast-iron floor plate to be japanned in the best manner; the plates can be made in 2 sections.

NOTE. The floors in the bases of warming chambers around the radiators, not occupied by the same, will be made over the iron beams by other contractors in the buildings; the steam-heating contractor to furnish and set the iron beams for carrying same and radiators as may be required and as before mentioned.

Dampers in Cold-air Ducts. A damper to be placed in each cold-air duct near the entrances to same; these dampers to be arranged and to be either hung on hinges or pivots and to be operated at basement-floor level with cords, irons, or other suitable fixtures, so that these 4 dampers for regulating supply of cold air to radiators will only be under the control of the janitor; and the dampers to be made with galvanized iron secured on a proper frame work of wood; also place dampers made in 2 or 4 sections in each top of foul-air shafts with cords down to basement floor for their proper operation.

Janitor's Office. The direct radiator in janitor's office to contain 20 feet of warming surface; the radiator to have neat base and cap, to be placed under the window, with connection for cold air direct from outside, and to be properly arranged with the necessary feed and return, as before stated; the pipes or radiator to be properly finished, bronzed, etc., as required to make a neat and clean job.

Valves. All valves throughout to be Chapman Valve Mfg. Co.'s valves, and all up to 2″ in size to be of brass, and over that size to be iron bodies and brass trimmings, etc. All coils and radiators, both direct and indirect, are each to have an automatic air valve of Breckenbridge patent, known as the lock pattern, or others equally as good and as approved by Superintendent.

NOTE. Care must be used in putting in the work to have the lowest part of lowest radiators in the building not less than 3½ to 4 feet above the water line in the boilers. This is absolutely necessary to a free and easy working of the entire apparatus.

Connections, etc. All connections to stacks to be made with right and left couplings, or running thread with lock nut; no unions to be used in connections with any stacks or radiators; and the entire connections throughout to be made in the very best style, and so as to make a full and complete job in every respect.

Protection of Pipes. All pipes coming in the cold air ducts, crossing same, etc., as return pipes, etc., that are liable at any time to contain water, are to be properly cased and packed with asbestos packing, to thoroughly protect the same; and any other places in pipes that may be liable to contain water to be protected against frost as before mentioned, or can be packed with fine beach sand in suitable cases of wood put together with screws to hold the same.

Securing the Pipes. All horizontal lines of piping where not supported by any walls, etc., are to be properly suspended on wrought-iron hangers, yokes, or chains, in such a manner as shall allow of expansion and contraction; and on the brick and other masonry work the pipes to be secured and supported on proper irons for this purpose. Wherever any piping passes through the floors, protect the openings by patent asbestos-packed collars; and should the pipes come in contact with any wood work or timber, bed them in plaster of Paris not less than 1½″ thick.

Staging, Supports, etc. Support the radiators in each chamber as before mentioned, and at the level of each story convenient to top ends of the tin pipes conveying hot air to the different rooms, etc., place across the shafts iron-staging cross bars, and over these lay and secure sufficient light ironwork (so as not to impede draughts) as necessary for footways to get at the different pipes from the ladders in the angles—this for the purpose of putting up and securing pipes, etc., and for the janitor's use in getting to same to change from summer to winter ventilation, etc., and for any other purposes required, as repairs, etc. Also furnish the required substantial supports for the coils in top of the foul-air shafts as may be necessary and as before named.

Painting and Finish of Pipes, etc. The finishing of direct radiator to be as above named, and all piping elsewhere throughout the building that shows to have two good coats of black paint; also all piping in boiler-room and coal-room, etc., and other iron work, to have two good coats of paint similar to other work. Also paint all pipes that show in the warm-air chambers and other parts of the building in a proper and neat manner, to protect same properly from rusting.

Tin Piping, etc. All tin hot air pipes to be made with heavy, bright, XX charcoal tin, to be properly connected from the tops of the radiator jackets to the different hot-air registers in the building. Make all necessary connections as required to the registers, and solder all joints in these pipes perfectly tight. Make the connections at each end in the best manner, so there will be no escape of hot air except through the registers at top end; and all top ends of hot-air pipes to be enlarged one-quarter size, as may be required to fit into the registers, so that the openings in register faces will equal the total area of hot-air pipes; a cover to be placed over same; an opening to be made in the top end of each pipe, so as to be used for summer ventilation, and this opening to be 2″ less in diameter than the hot-air pipe, and to be made with a hoop 2″ deep to fit tightly over collars on top of hot air pipes; and the bottom side of this cover to be arranged so as to make a smooth surface on top inside portion of hot-air pipe, so as not to cause any impediment to draught of hot air with friction, etc.; this cover to be made with a cap on top part, the same size in diameter as hot-air pipe, and to be made slightly oval, so it can be dropped through the opening and placed on a slight ledge in hot-air pipe below the register, so as to close up the hot air pipe at this point and allow a free upward draught through the register (used in winter time for incoming fresh warm air) for use in summer ventilation; this cover to be fitted snugly and perfectly tight, so as to fit in both positions, as shown on sketch annexed; all horizontal hot-air pipes to be one third larger in size than the vertical pipes.

Registers. All registers throughout the building to be of best quality.—Tuttle & Bailey's open flat-faced registers finished in a neat and artistic manner; the hot-air registers to have wire cords and iron tassels, marked Open and Shut, placed on each at a proper and convenient location within easy reach. The registers in all cases to be properly secured in place on the brick walls, etc., and the connections made in the best manner possible.

Ventilation Registers. The ventilation registers to the first and second stories to be about 20″ high as far as practicable, to suit the widths of spaces for some; and each where connecting into foul-air shafts to have galvanized iron shoes on casings properly secured to same, and to extend into the shafts a proper and sufficient distance, so as to convey the foul air far enough into shaft that the upward current from below will not interfere with draughts from the different rooms, etc., above; this iron lining or casing to be of No. 24 iron, riveted, soldered, and properly secured in position. These casings are required only above basement floor level in first and second stories; the foul-air or vent registers in basement to be about 18″ high as far as practicable, and placed 3 or 4″ above floor level, or close to warming-chamber floor levels, as may be necessary.

Marking of Radiators, Valves, etc. Each nest of radiators to be properly lettered and marked for the rooms they are connected with.

All valves in connection with the boilers to be marked with brass tags secured with chain; also all valves pertaining to the changing of the pipes from the large boilers to the small one to be properly marked with brass tags similar to other valves, all plainly lettered and marked what they are for; and all pipes, valves., etc, to be properly marked throughout the building, so as to make a complete and first-class job in this respect, so the janitor can understand same, and to enable him to make no mistakes in the turning on or off any portions of the work to suit the different wants and conditions of the building, as before mentioned in every particular; the sizes of pipes, registers, number of feet of radiating surface required to each room, etc., where not otherwise specified, to be as per schedule given below; and all the pipes to be put in as herein named and in the best possible style for the purposes intended, and perfect in all respects, and the entire apparatus to be delivered up in complete working order, to be thoroughly tested and proven; and the warming and ventilating contractor to guarantee the whole of his work for a space of one year from the time of completion, and to do any repairs needed within that time; and the warming and ventilating contractor to guarantee to warm the school-rooms in the building at breathing level to 70 degrees Fahrenheit in 4 degrees below zero weather, and to warm the halls of first and second floors to 65 degrees, and the basement play-rooms to 58 or 60 degrees in zero weather.

Number of Feet Surface of Steam Pipes in Radiators, Sizes of Tin Pipes, Registers for Incoming Fresh Warm Air, and Outlet Ventilation Registers.

SECOND STORY.

North school-rooms, having 2 sides exposed to the exterior, to have 437 feet of warming surface, 26″ pipes for conveying hot air, 708 sq. inches in hot-air registers, and 940 sq. inches for outlet ventilation registers at base of rooms.

South, east, and west rooms, having 2 sides exposed, to have 375 feet of warming surface, pipes and registers for incoming air, and outlet registers same as for north rooms.

Centre school-rooms having one side exposed, to have 330 feet of warming surface, with pipes and registers as above.

Class-rooms in centre of building to have each 140 feet of warming surface, hot-air pipes 18″ in diameter, registers 295 sq. inches for incoming hot air, and 390 sq. inches for outgoing foul air.

Second-story hall to have 4 radiators one in each chamber, of 165 feet warming surface each; to have 295″ in each incoming register, 18″ hot-air pipes, and 480″ in each outgoing foul air register.

FIRST STORY.

North room, with two exposures to exterior, 437 feet of warming surface, 28″ hot-air pipes, 821 sq. inches incoming-air register, 1,090 in outgoing.

South, east, and west rooms, with 2 exterior exposures, 374 feet warming surface, 28″ pipe, and registers as above.

Centre rooms, with one exterior exposure, 330 feet warming surface, 28″ pipe and registers as above.

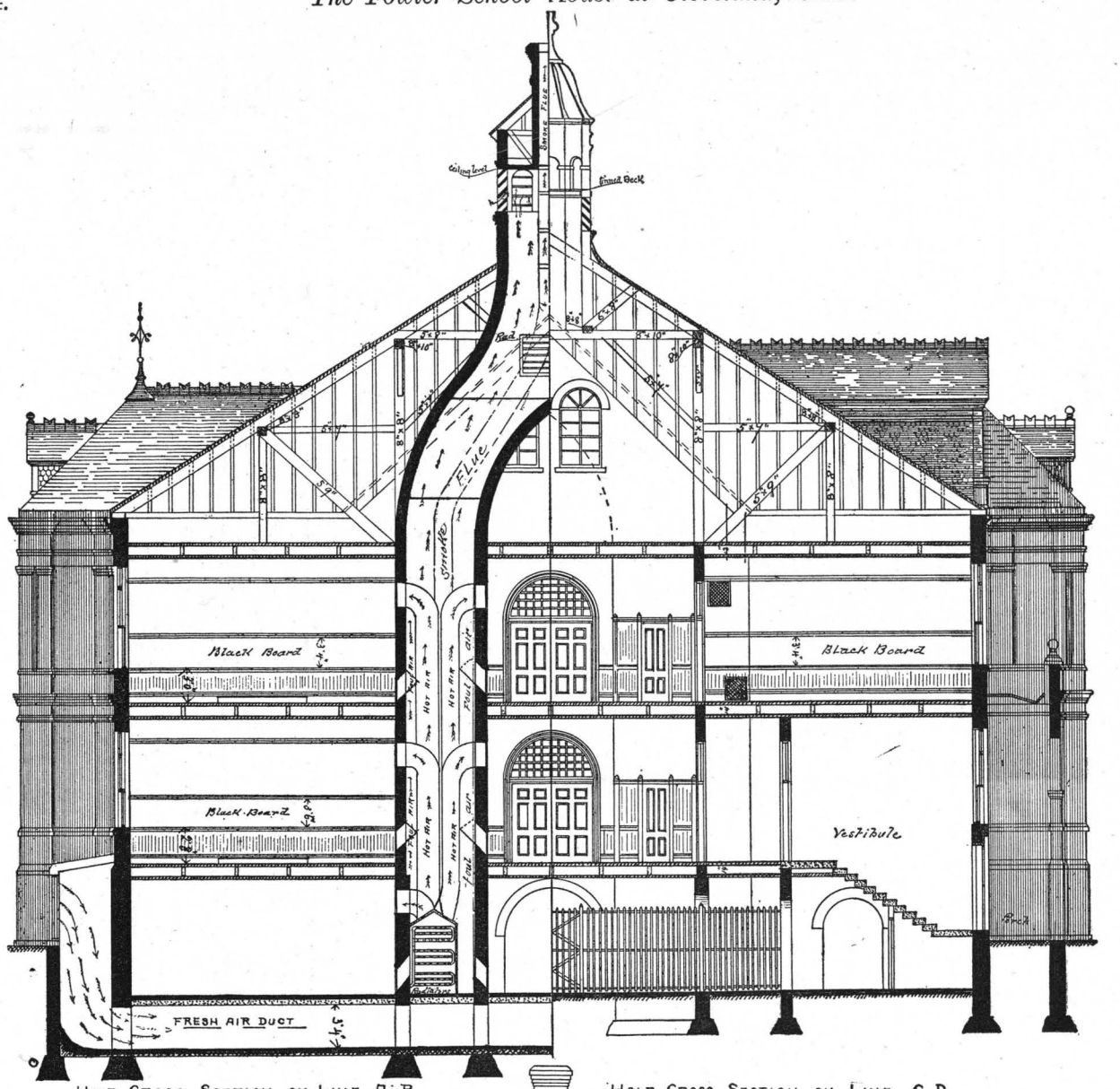
Class-room, 137 feet warming surface, 20″ pipe, 342″ incoming register, and 450 in outgoing.

Hall, first floor to have 4 nests of radiators of 200 feet each, 20″ pipes, 342″ incoming registers, and 560″ in each outgoing register.

BASEMENT.

Play rooms to be 6 nests of radiators of 160 ft. each, 18″ pipes, 295″ incoming registers, 650″ each outgoing; the registers for all incoming air to be single registers, while those for outgoing can be in two or double—these latter to be set as near floors as can be and so arranged that one half can be closed as required. For height of the outgoing registers reference is made to figures given in other part of this specification, and the incoming registers to be arranged about square, and placed about 10.0″ high from floor to centres in the first and second floors, and in the basement about one foot or so below the ceiling.

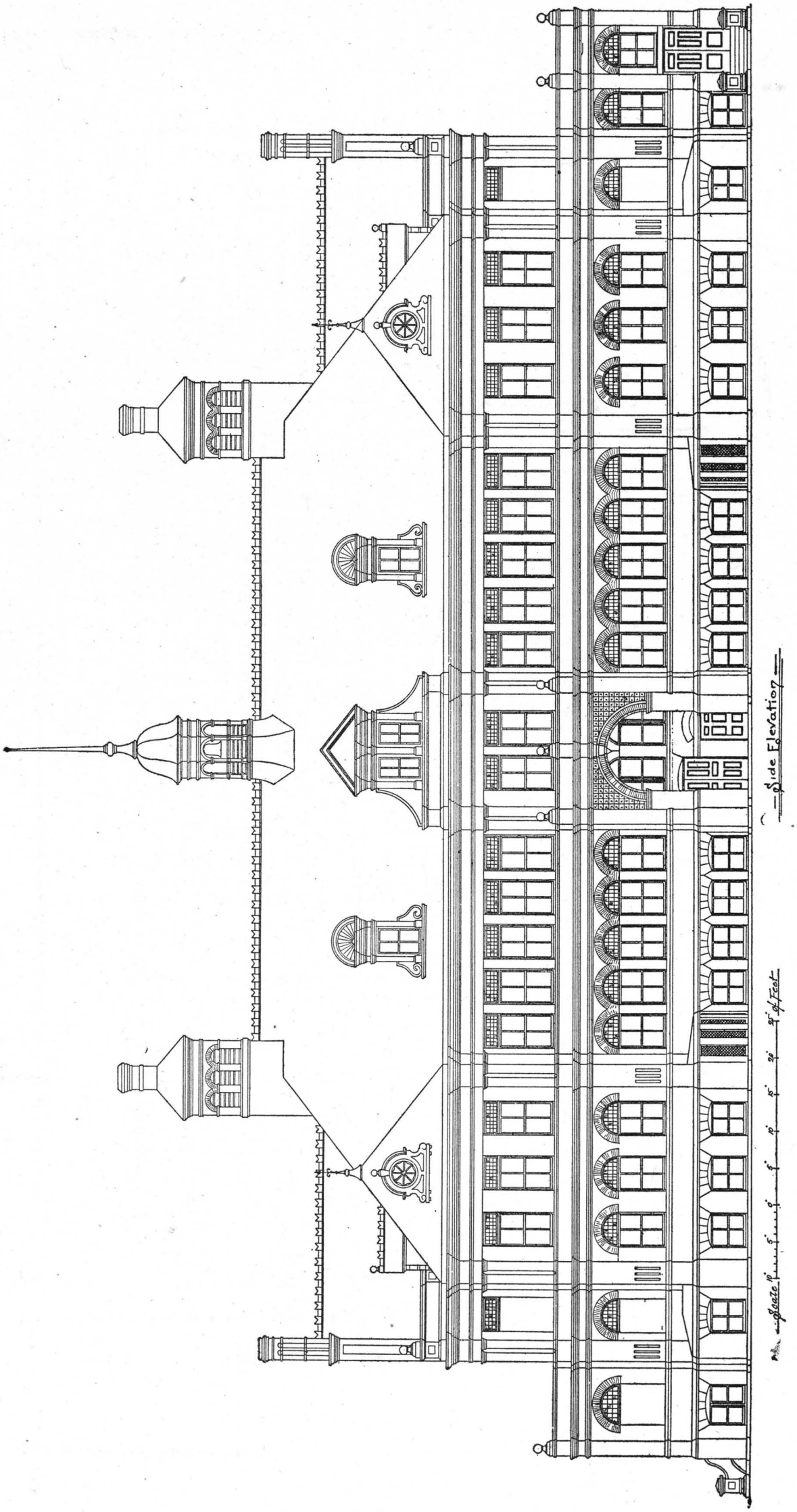
The steam-warming contractor is to do all work herein referred to in the very best manner possible, to use only the first quality and best materials of the different kinds required, to use every care in putting in his pipes, so as to make a perfect success of the entire apparatus, and to make no changes from the sizes and figures here given unless authorized to do so by the architects, and to refer all points not understood to the architects for consultation, and be governed by their decision in all things pertaining to the work, the drawings or specifications, and to do the entire work to the architects' full and entire acceptance, as well as the Board and their Superintendent; and any materials, fixtures, valves, or other things that may be necessary to be put in to make a full and first-class job in every respect are to be furnished and put in by the warming contractor without any extra charge, as it is intended by these specifications to cover everything requisite and necessary to the full completion of everything to run the apparatus as before named, and which is to be guaranteed and thoroughly proven in every respect before it can be accepted.

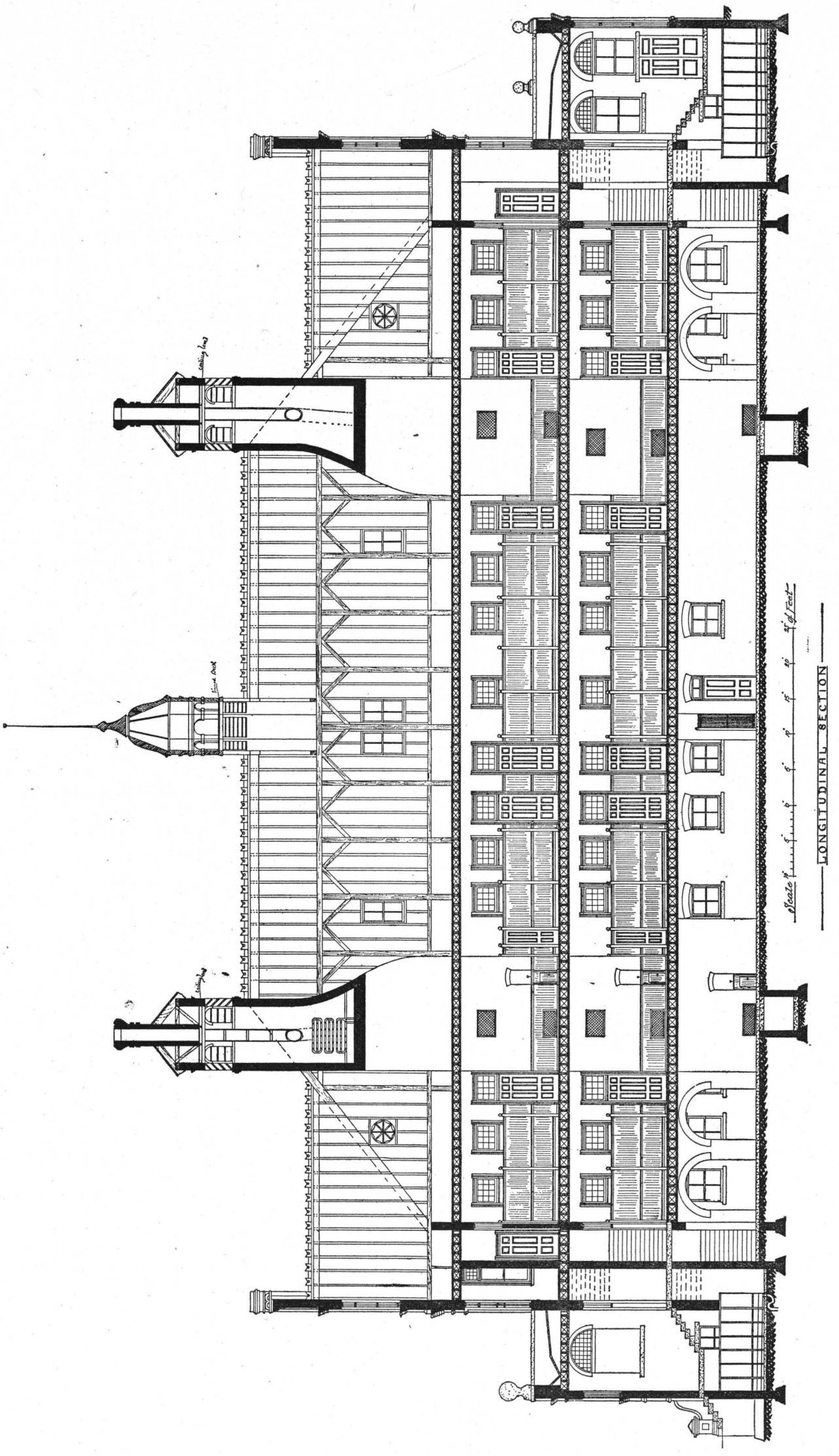


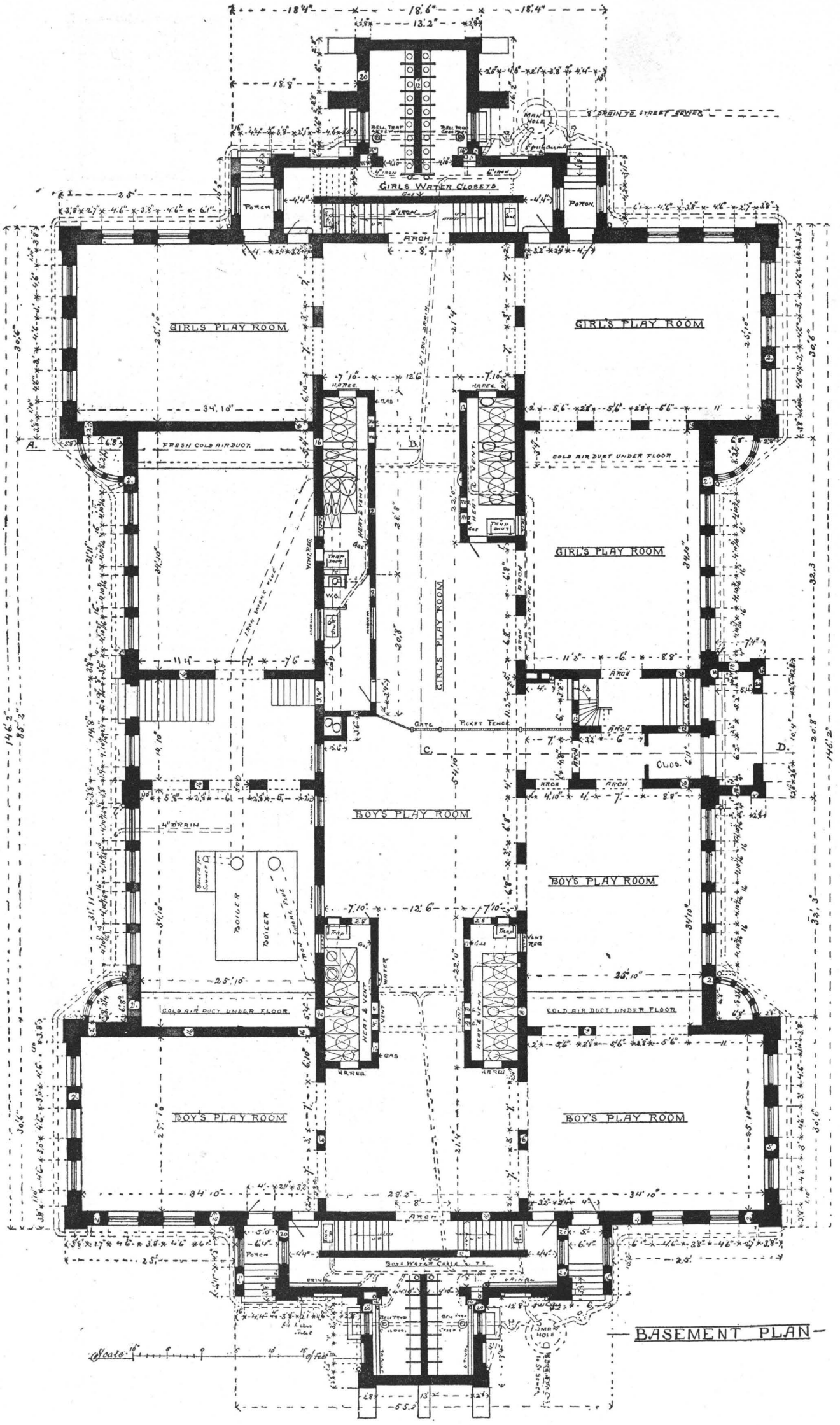
HALF CROSS SECTION ON LINE A. B.

HALF CROSS SECTION ON LINE C. D.

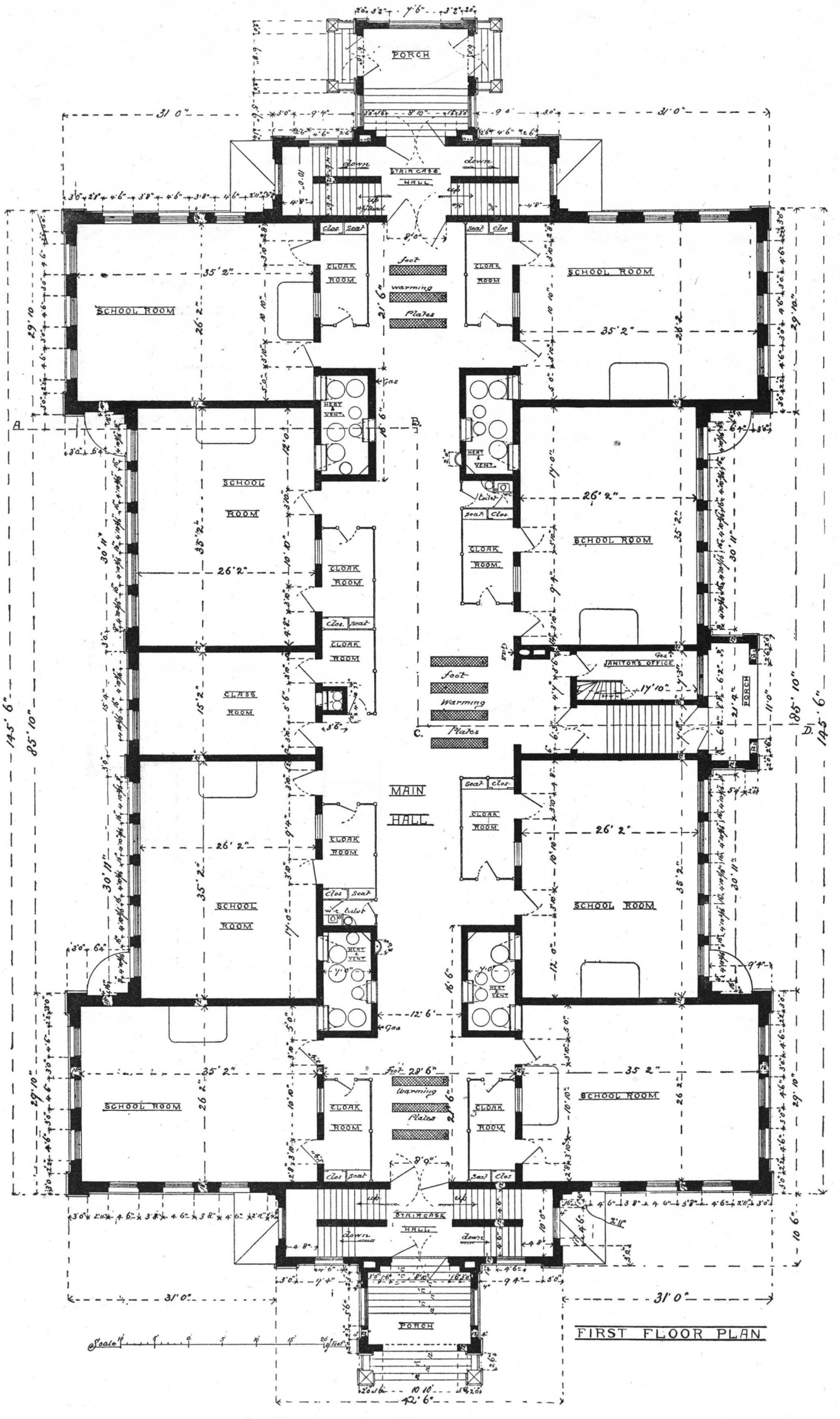
Scale 10' 5' 0 5' 10' 20 of Feet — Front Elevation.

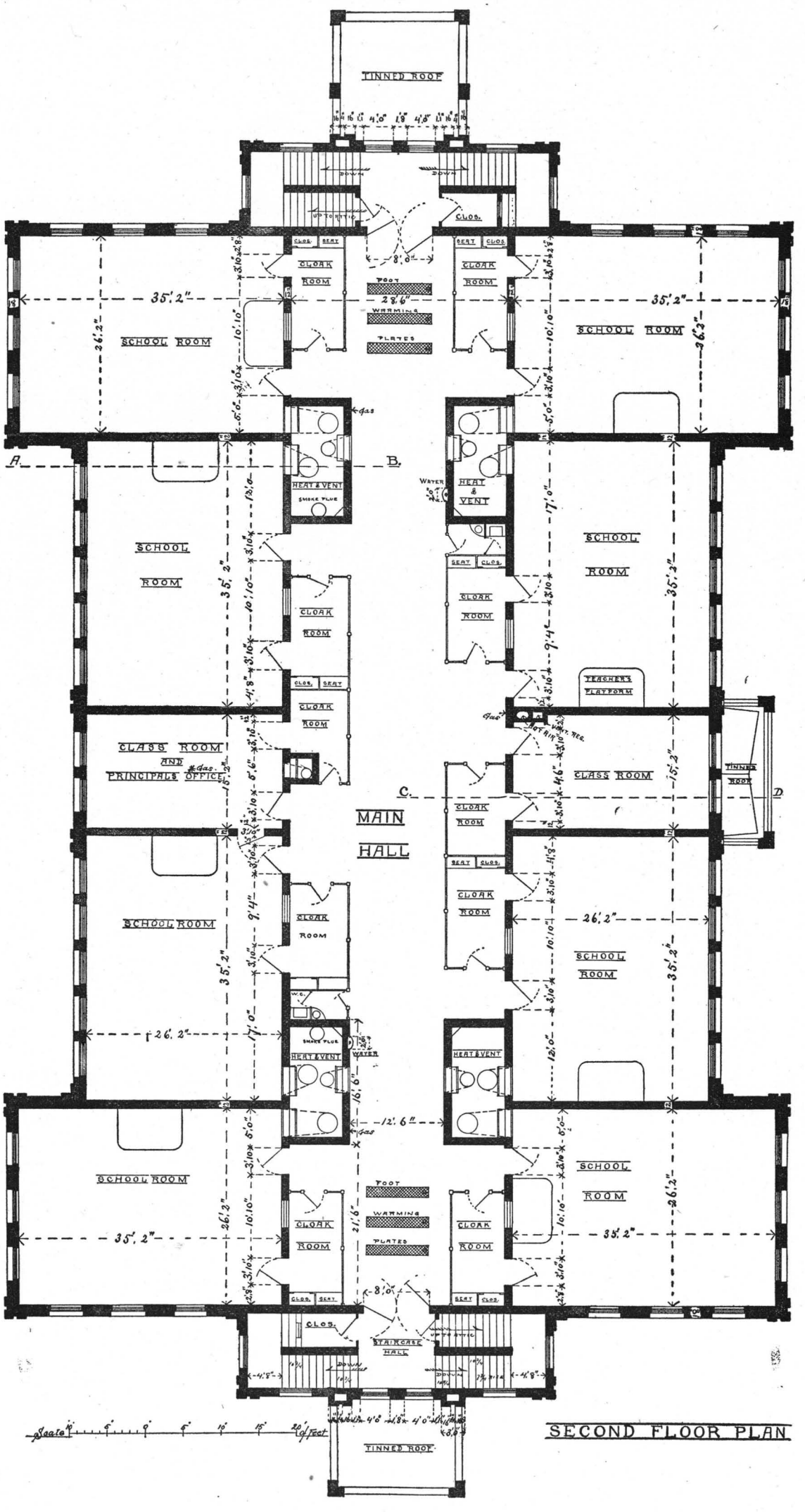


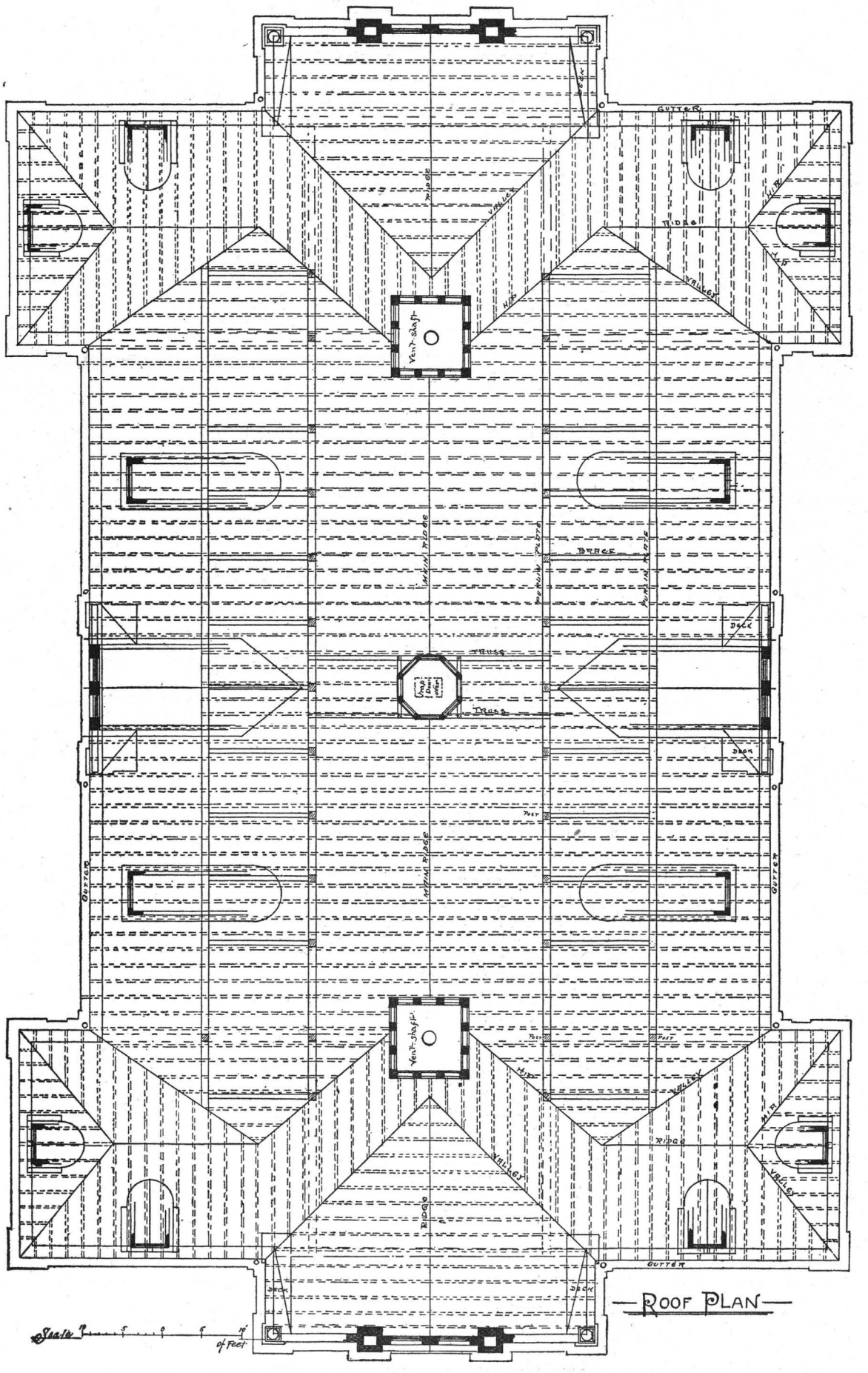




BASEMENT PLAN

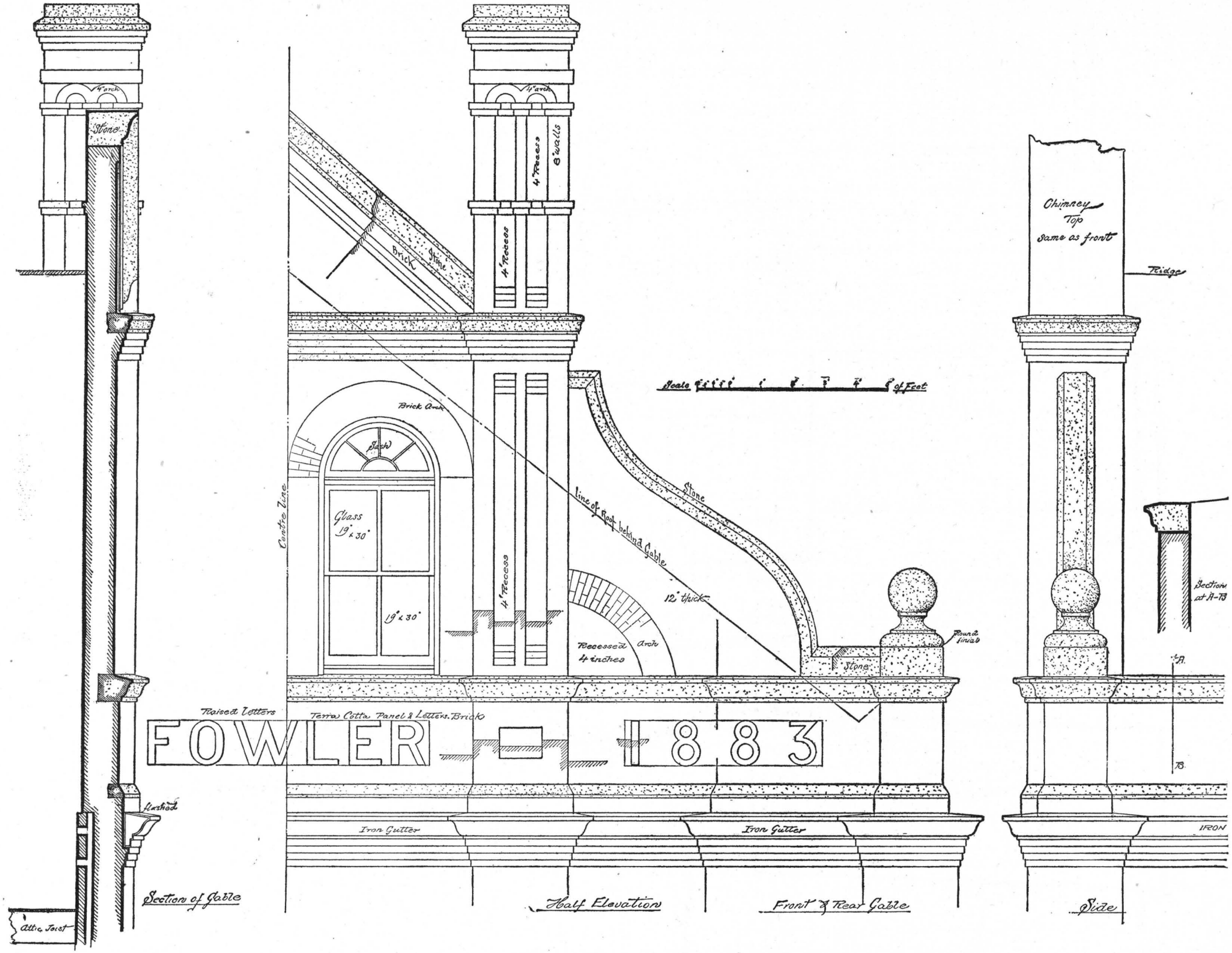




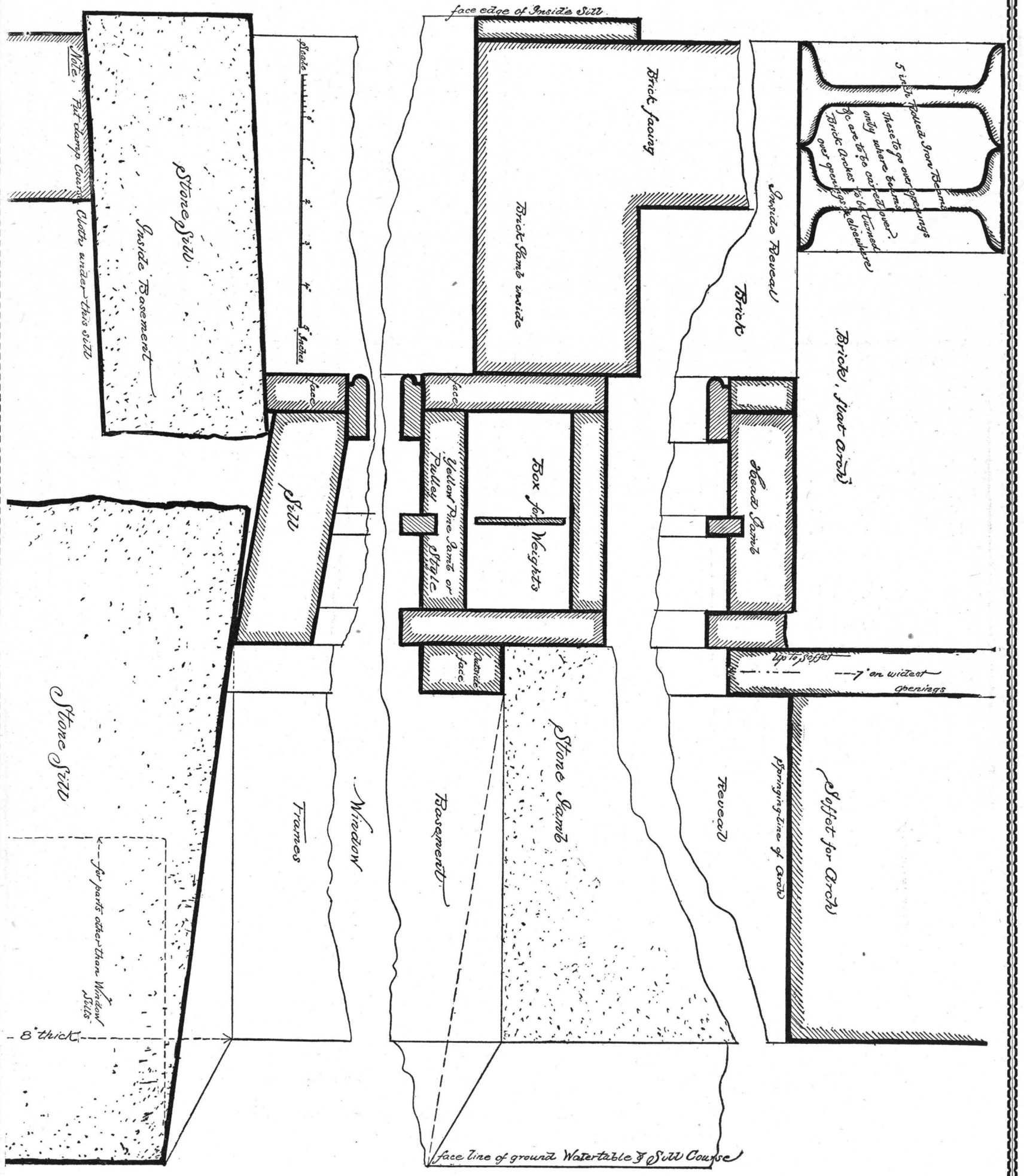


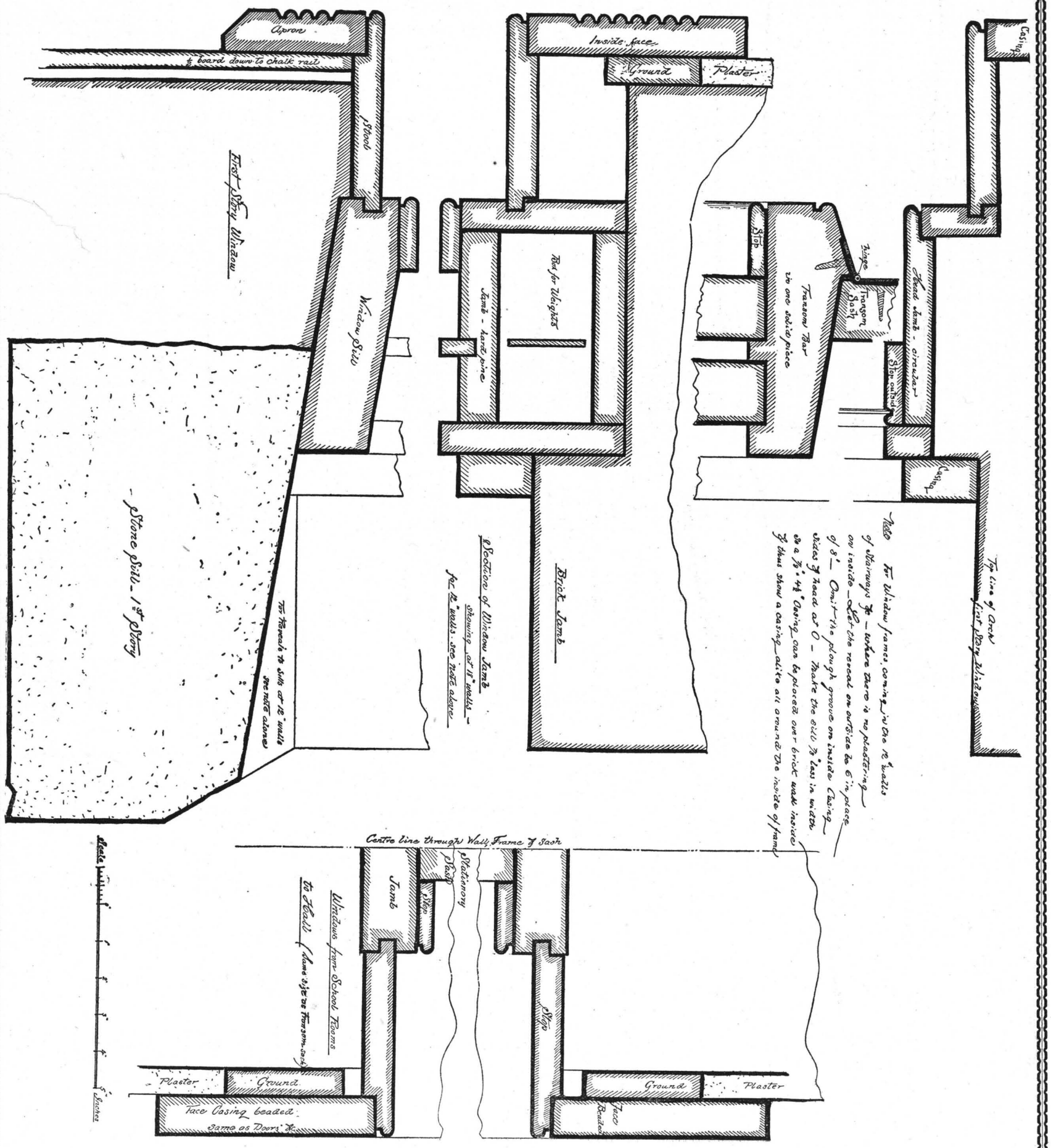
ROOF PLAN

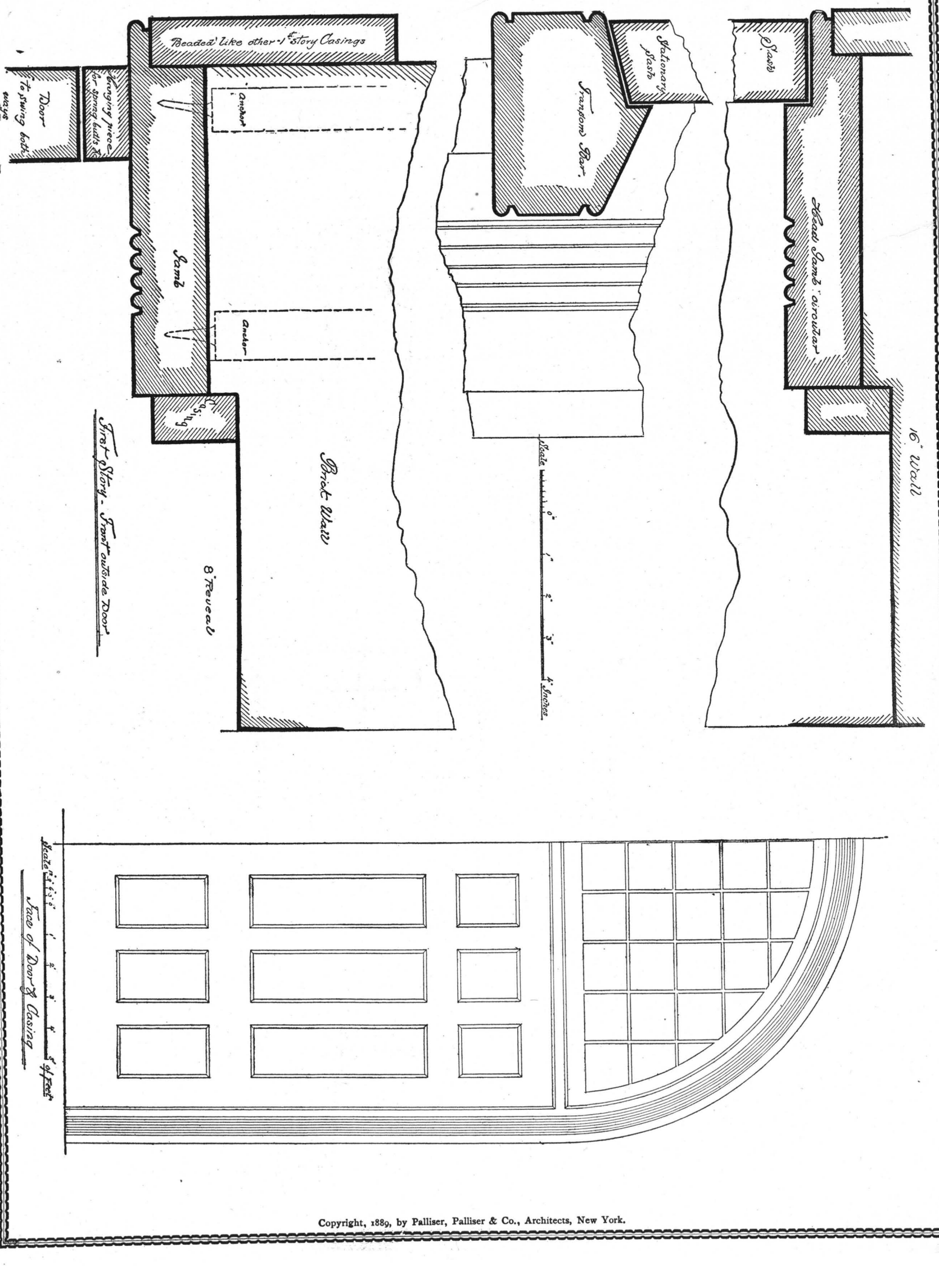
Details of the Fowler School House at Cleveland, Ohio.

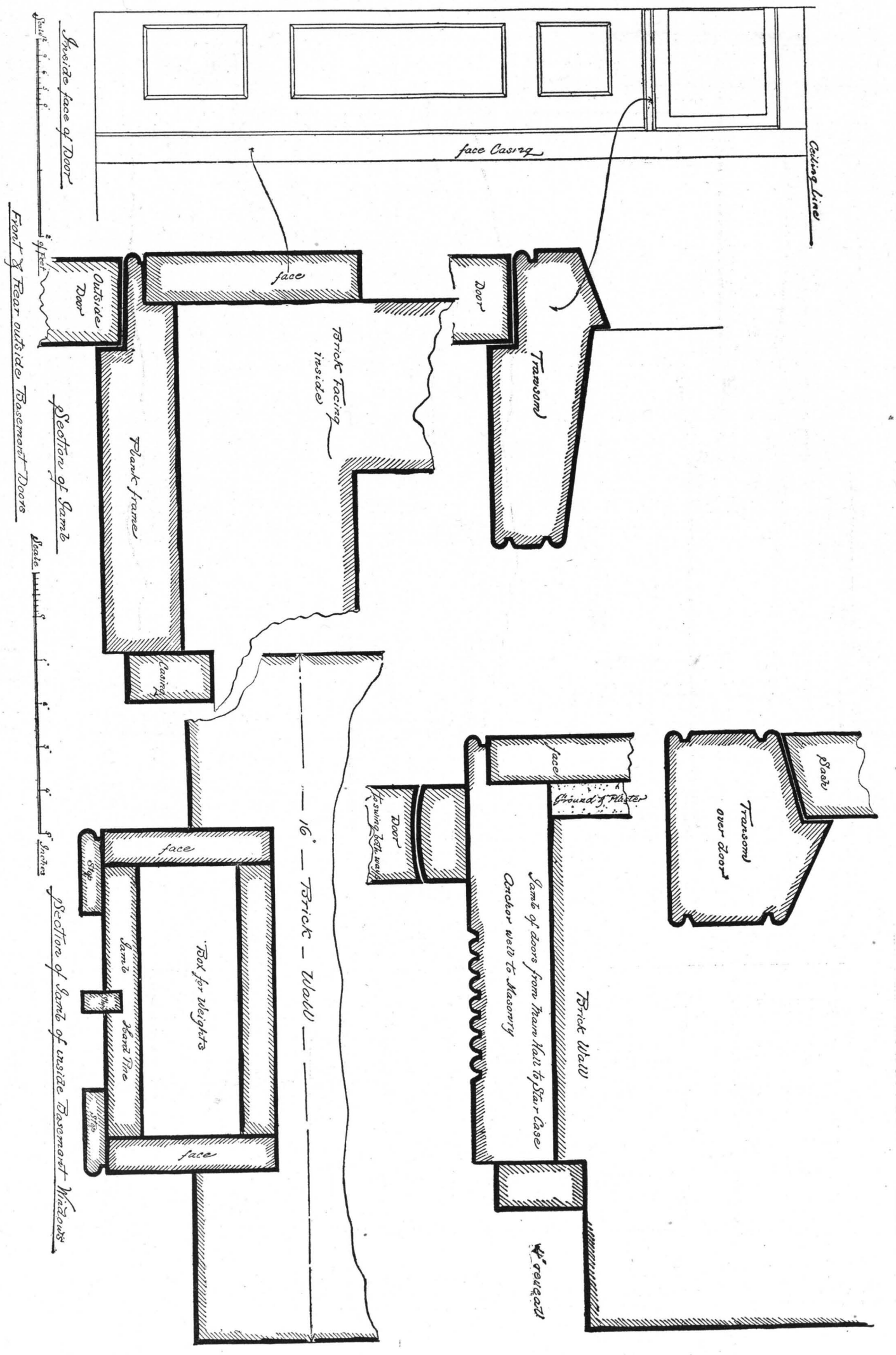


Scale 0 1 2 3 4 5 of Feet

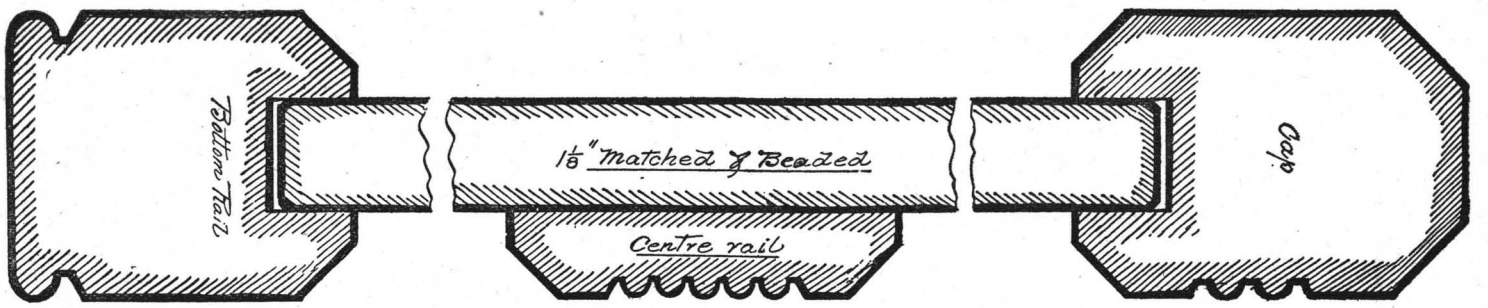








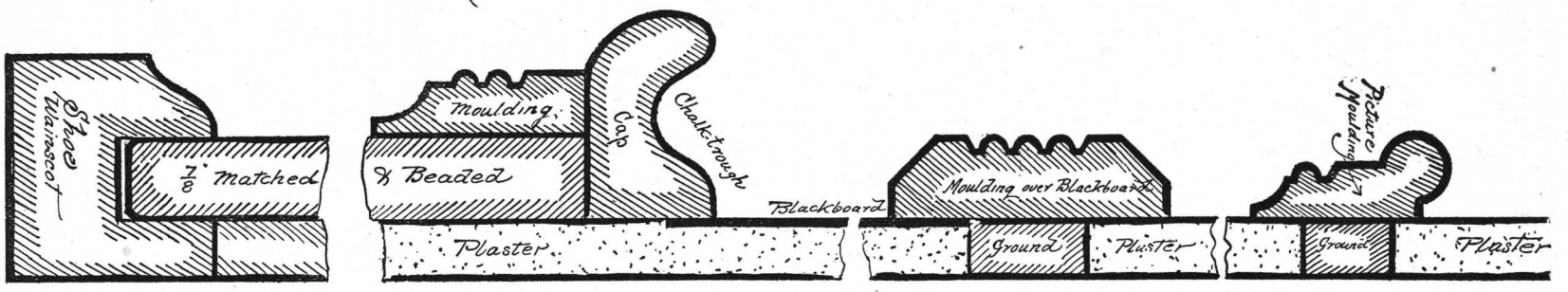
Face
Ground
Plaster
Jamb
Head Jamb
Furring for Panel of Jamb
Panel of Jamb
Head Jamb
Door
Ground
Face, Casing, like other side
Section of Inside Door Jambs
Note Width to vary in panel to suit thickness of walls
Scale 1½" 3" 6" Inches
Beaded Casing
Face
Ground
Plaster
Head Jamb
Panel of Jamb
Panel Stops ¼ from Side
Transom
Sash
Sash
Ground
Plaster
Face
Beaded Casing
Scale 1" 2" 3" 6" Inches
1st Story Main Doors
Glass
Rebate for Door
Rebate for Sash
Jamb of Door

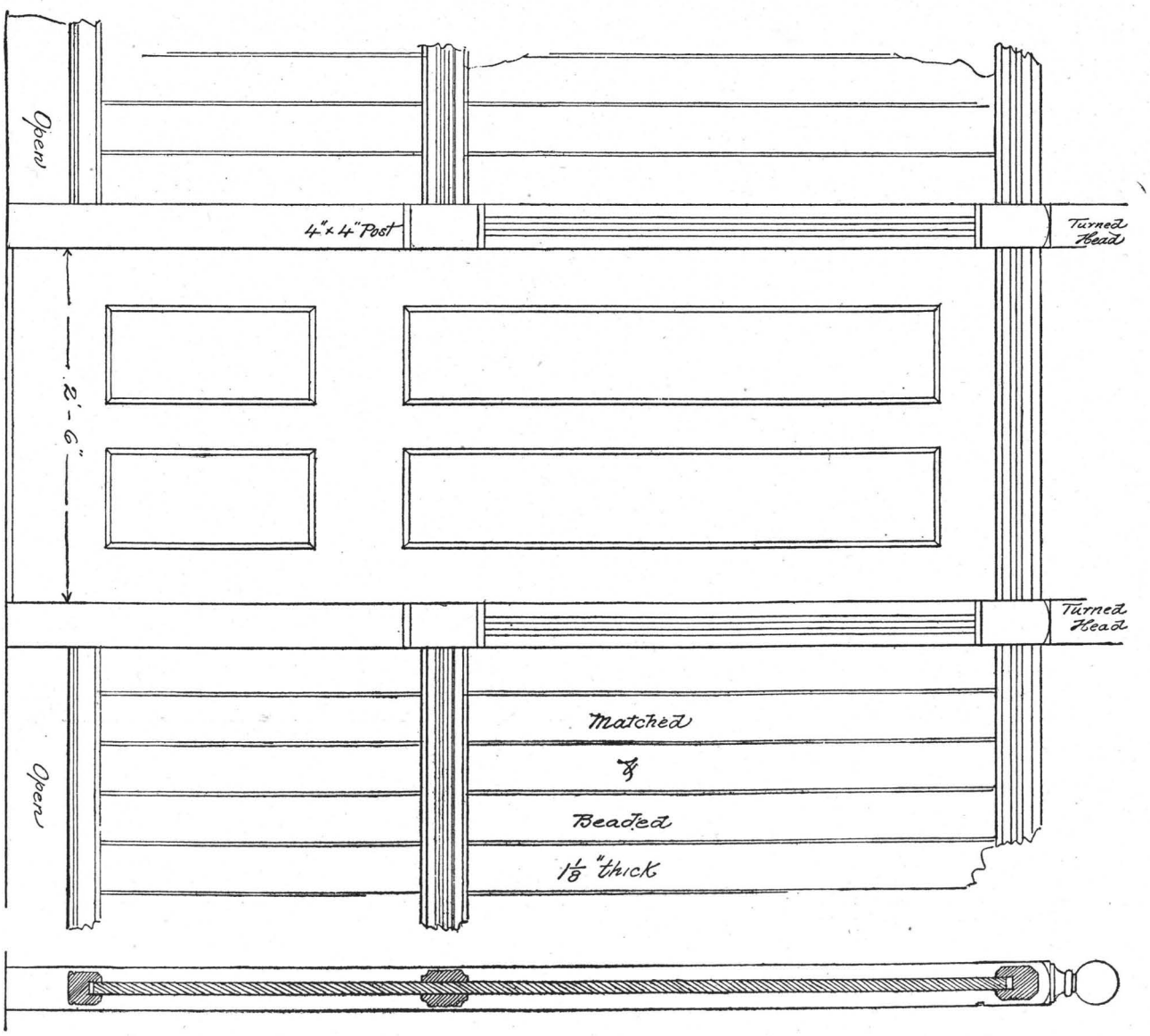


Detail of Hat & Cloak room partitions

Scale 0 1" 2" 3" 4" 5" Inches

Detail of Wainscot &c.



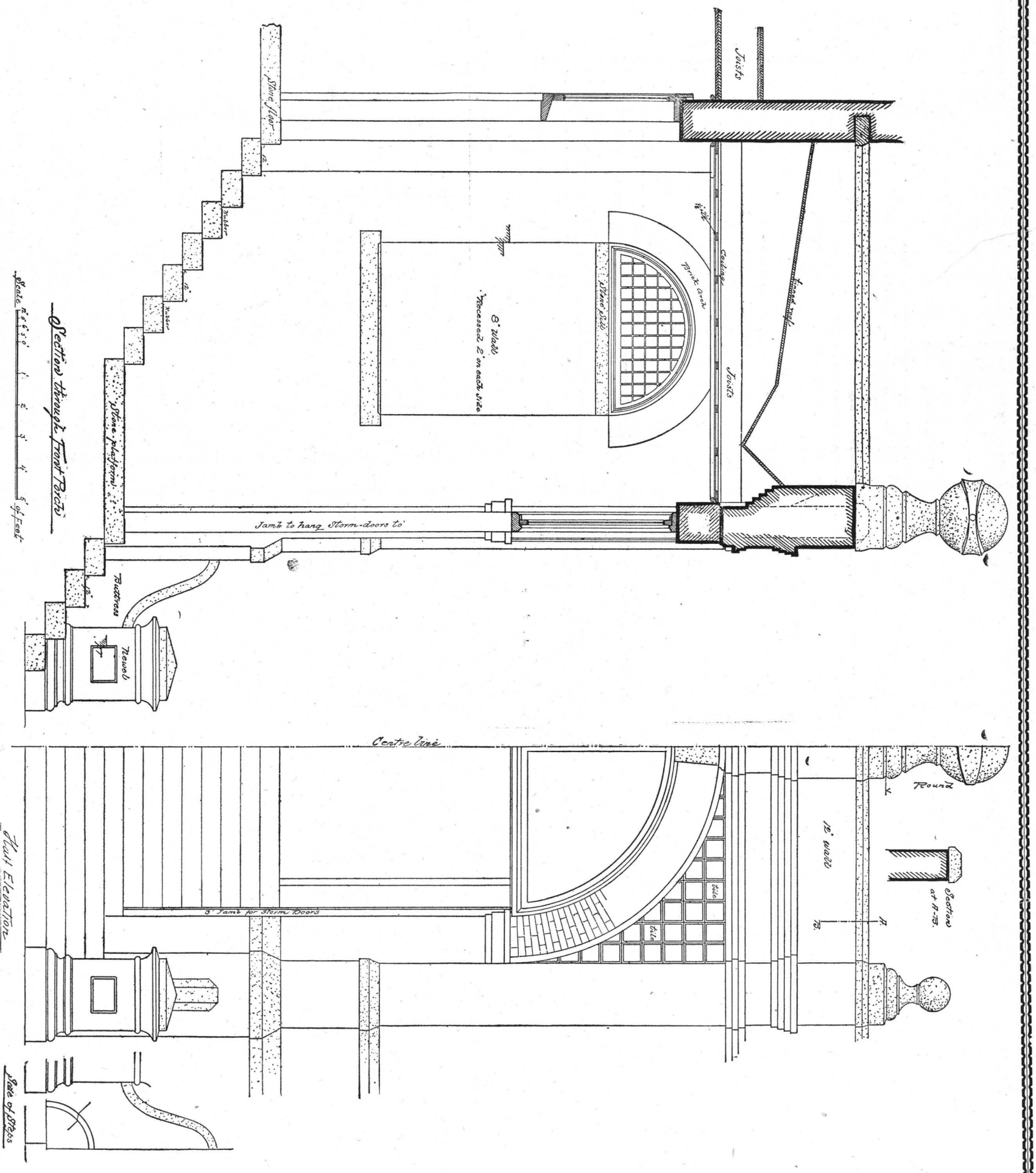


Elevation

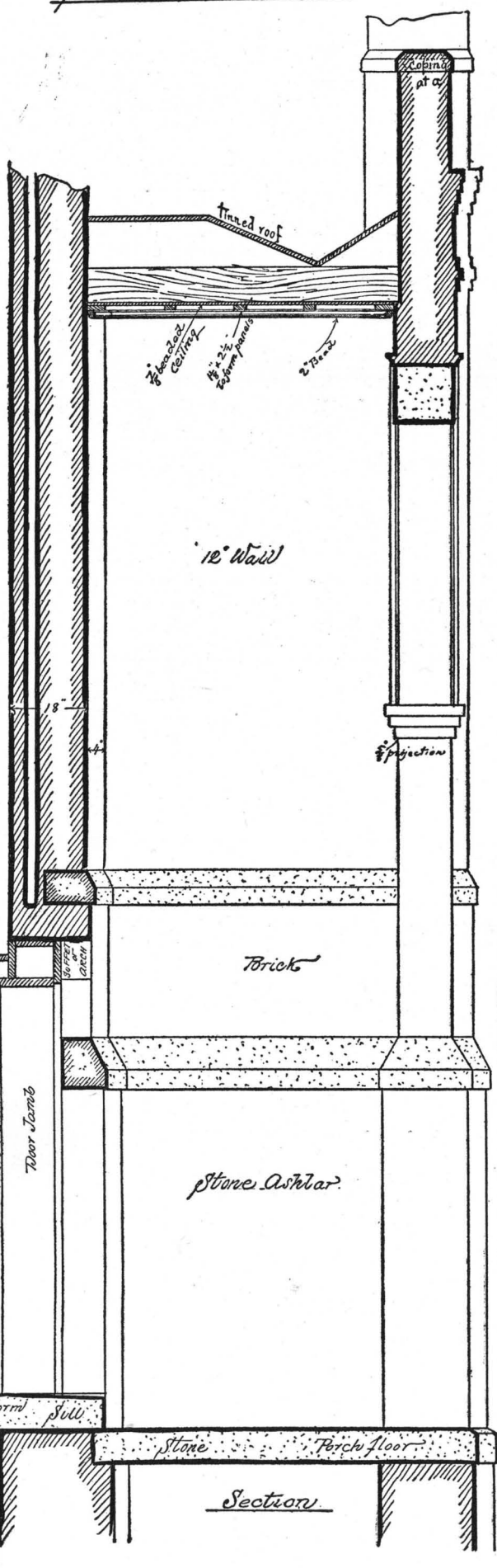
Hat & Cloak Room partitions & Doors

Scale 12" 9" 6" 3" 0" 1' 2' 3' of Feet

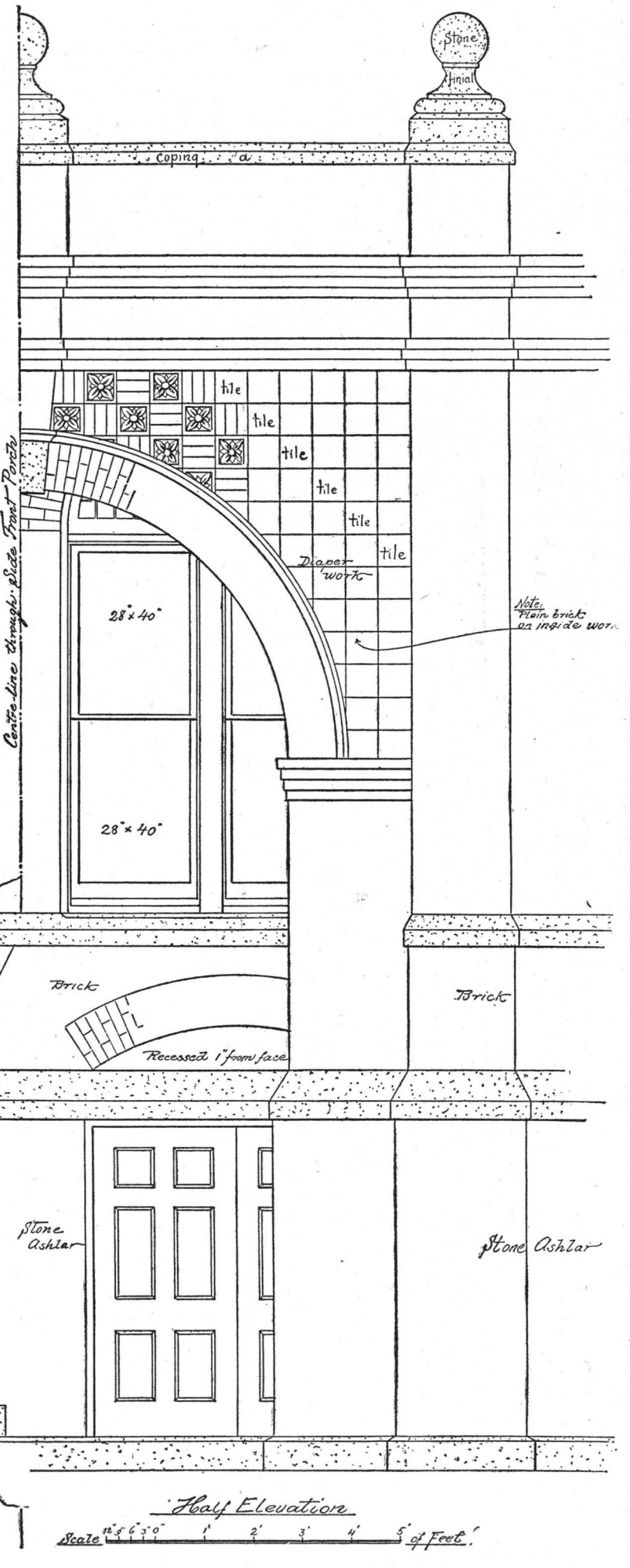
Section of Partition



Side Entrance Porch

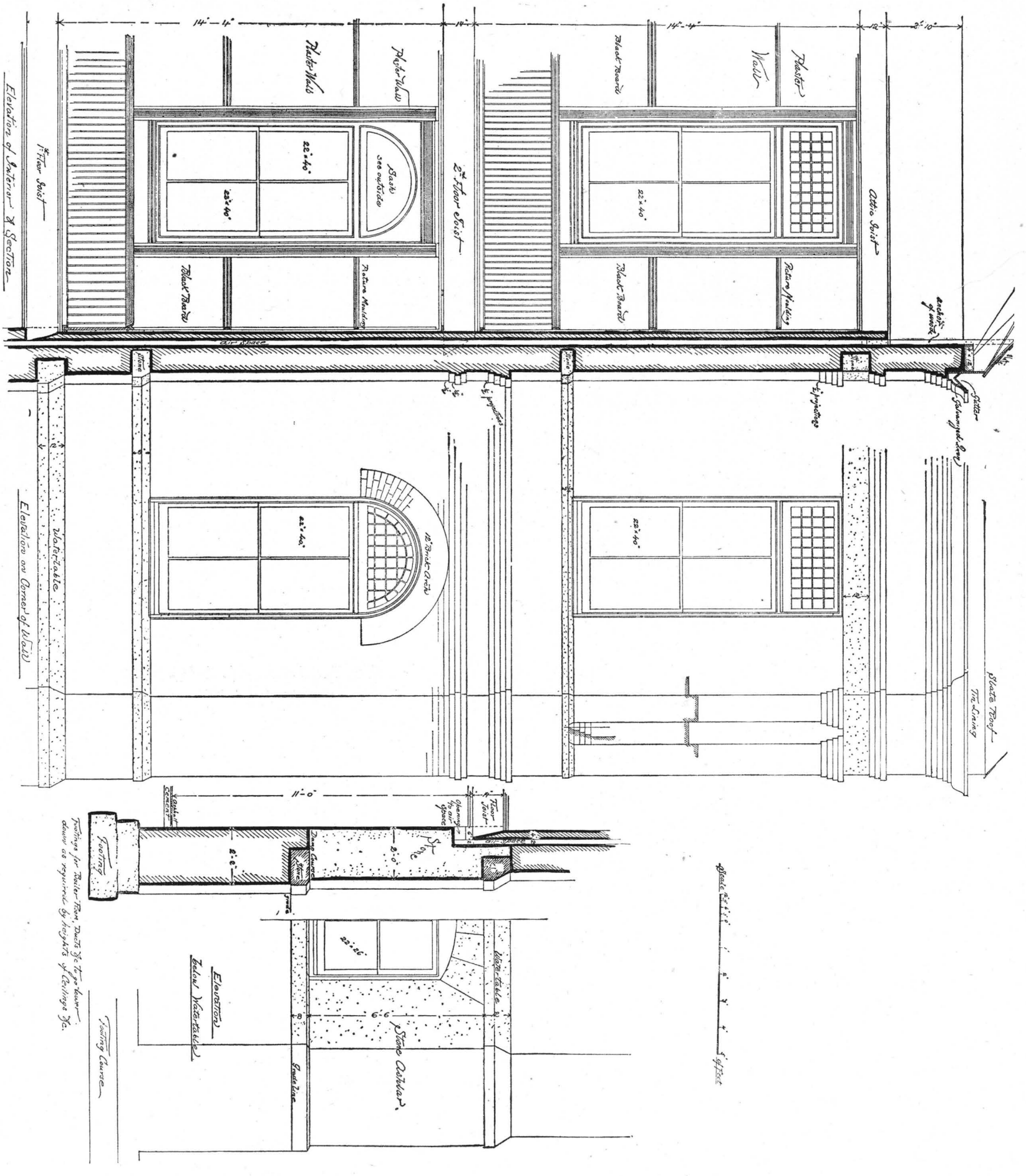


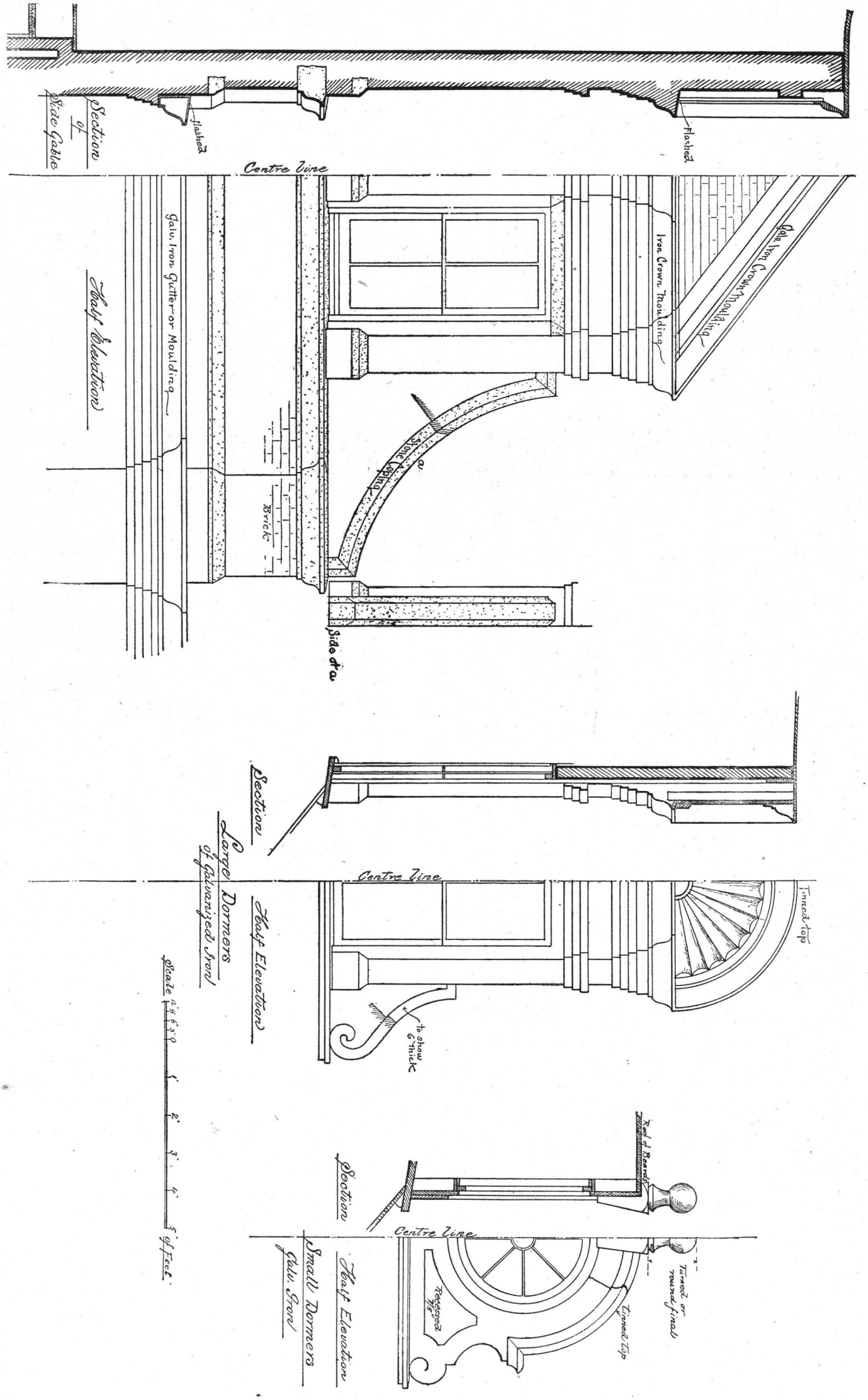
Section

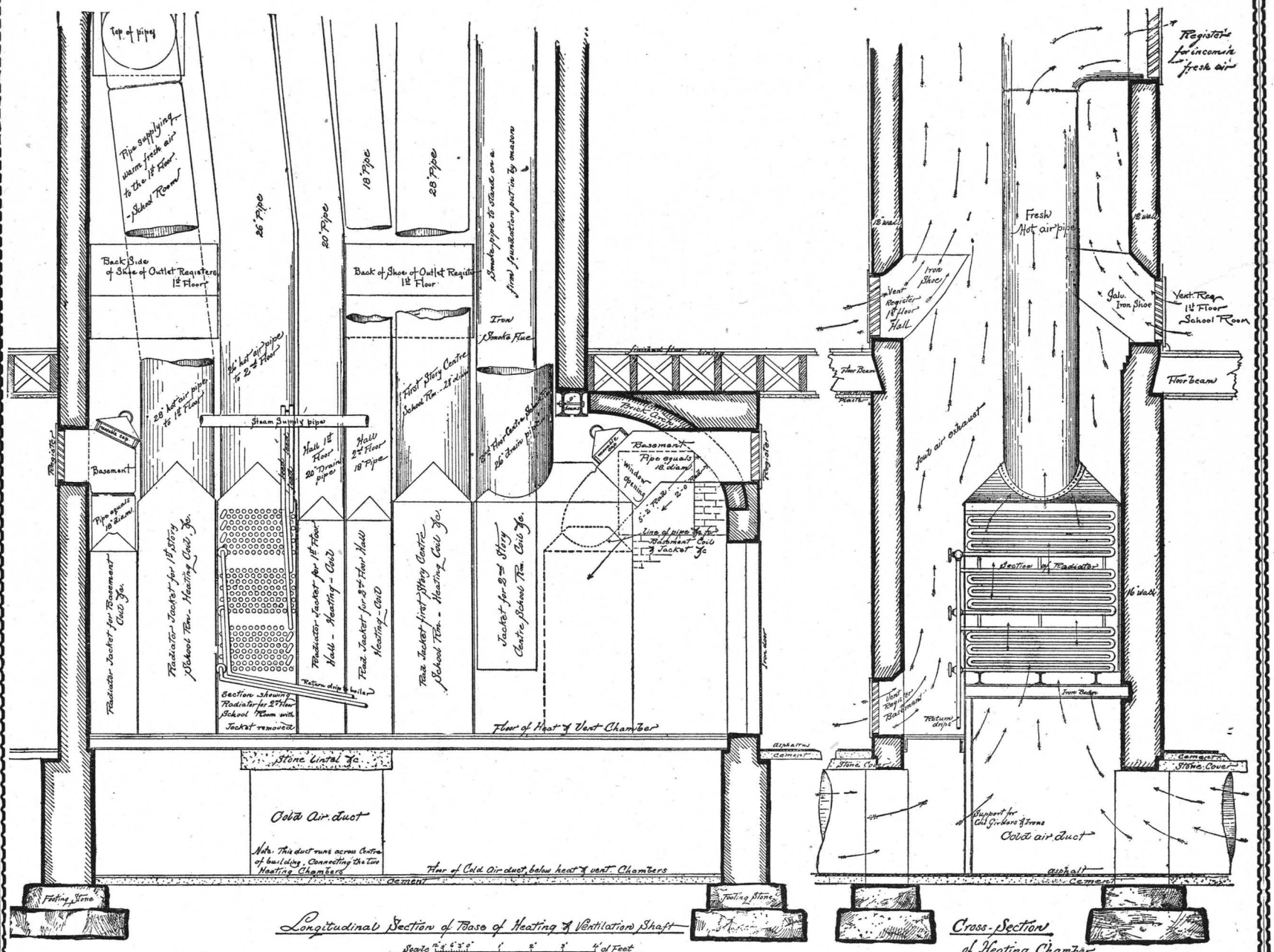


Half Elevation

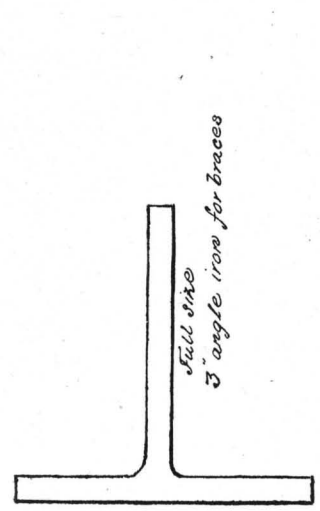
Scale 1" 6" 3' 0" 1' 2' 3' 4' 5' of Feet.

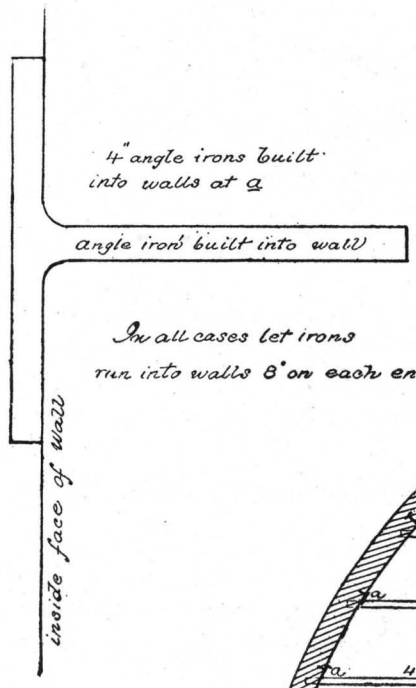


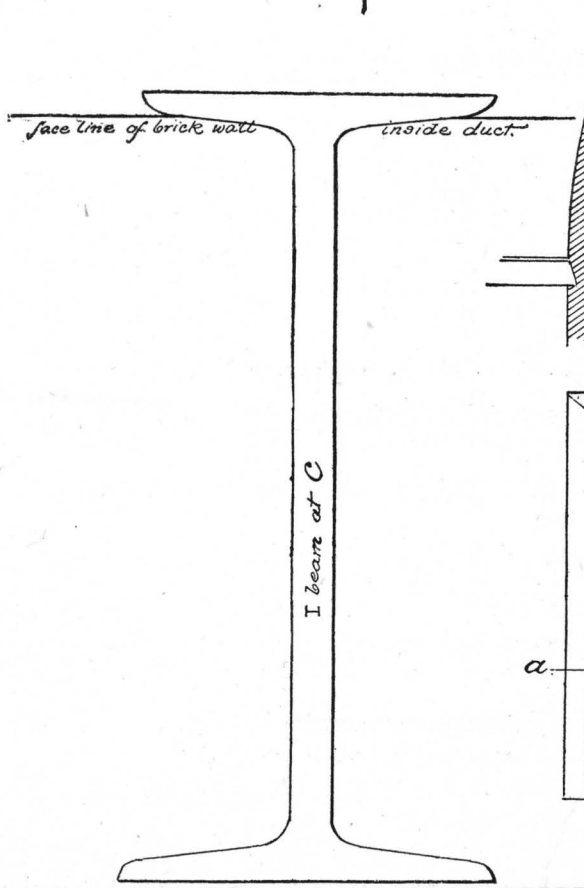




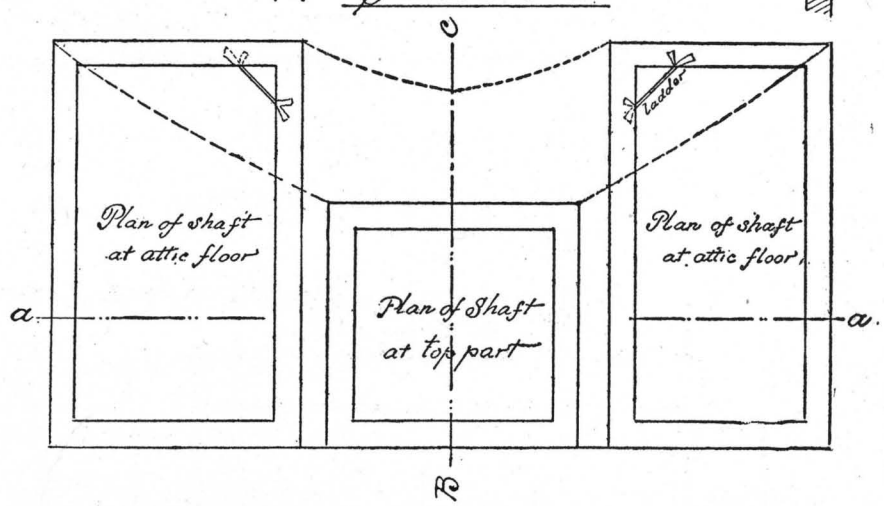
Detail for Heat- & Vent. shafts, showing construction of same through the attic & up to roof.

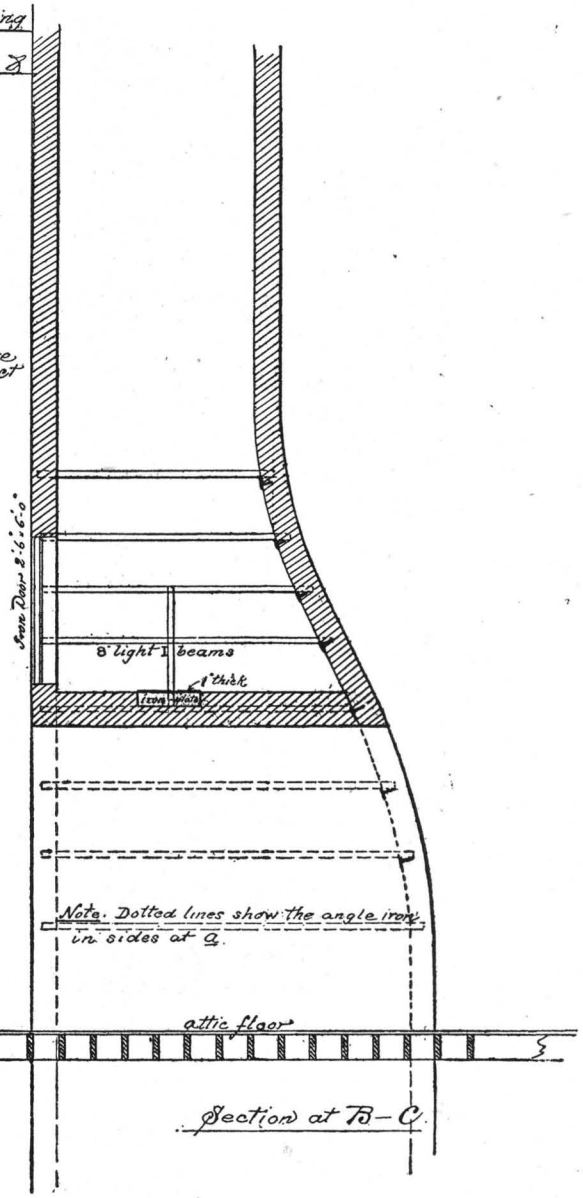






Section at a-a

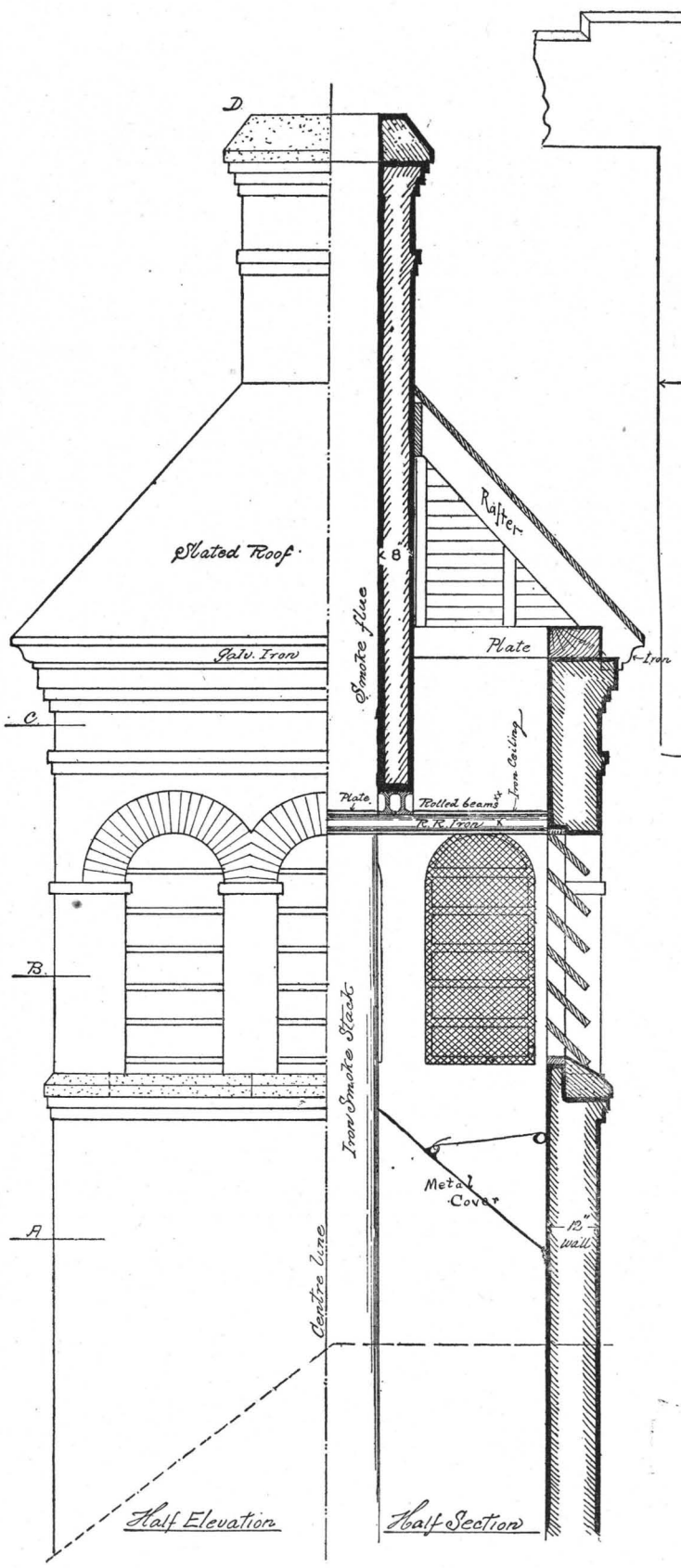


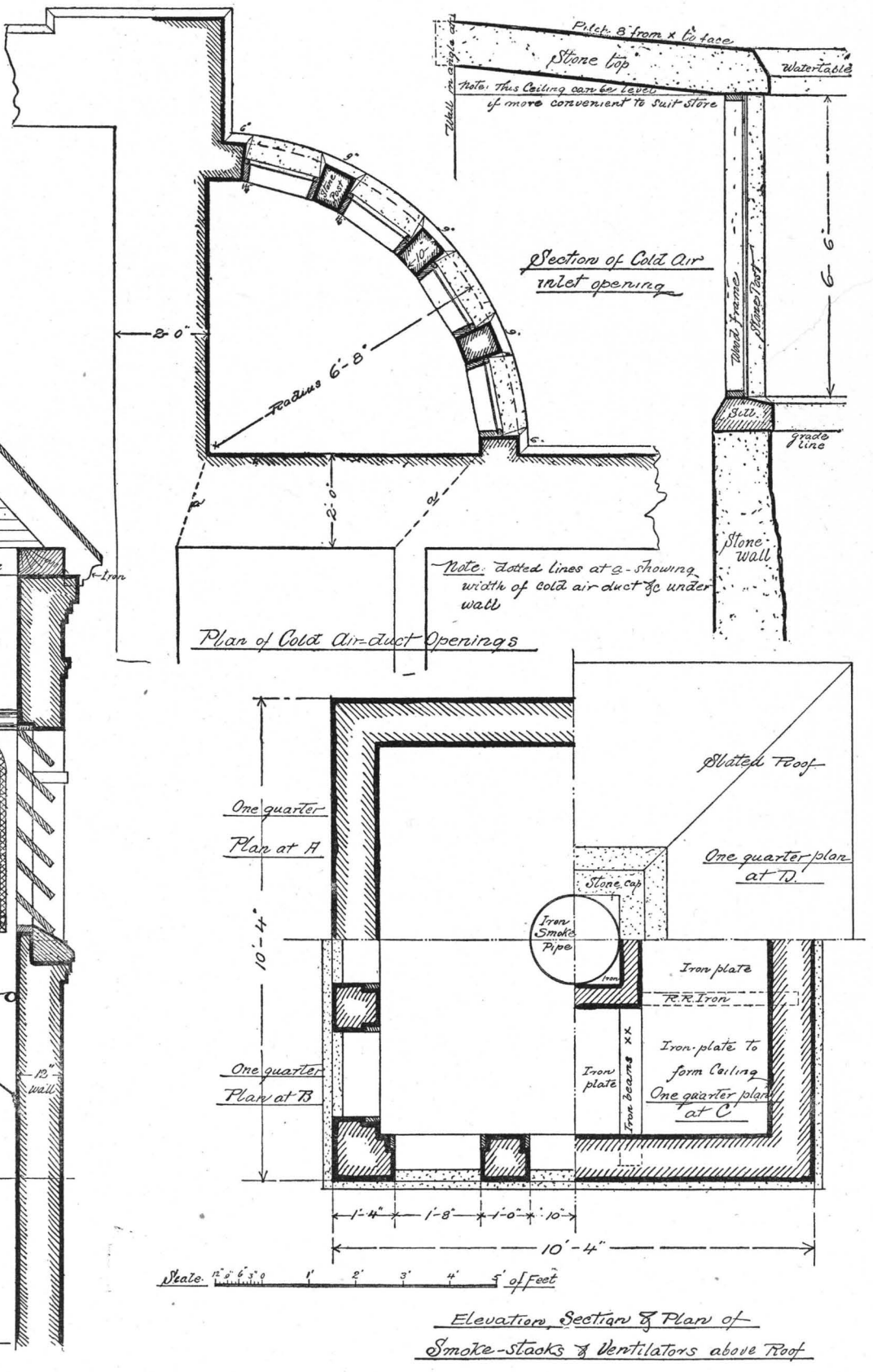


Section at B–C.

Note. Let the corners on walls be well secured to gutter & walled in solid firm &c.- The braces to be properly bolted to plate, resting on apex of walls as shown & to the beams in walls at top; ladders in angles to be continued up to the top part of shaft to the ventilator openings.

Scale 5" 4" 3" 2" 1" 0" 5" 10" 15" of Feet

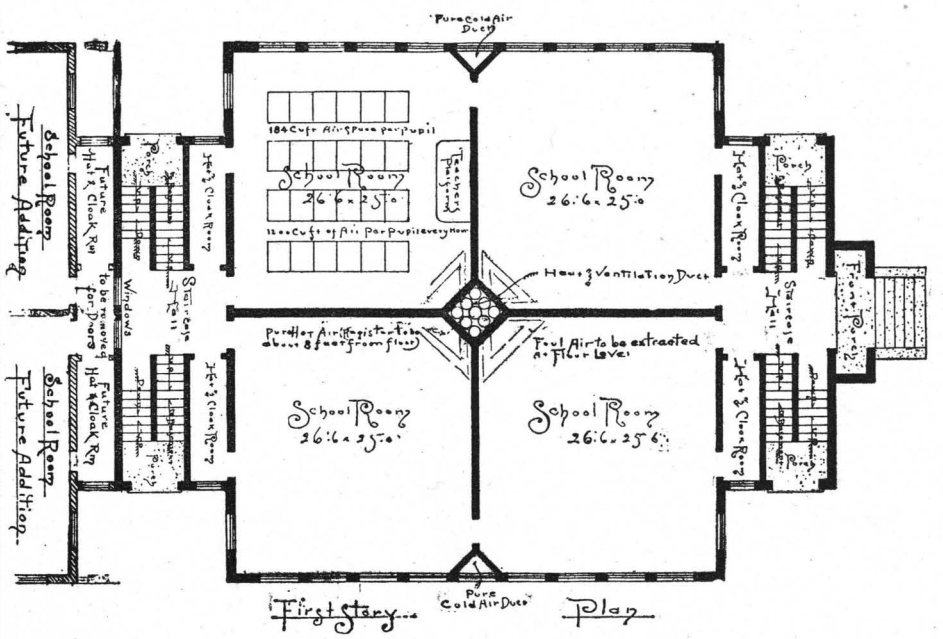




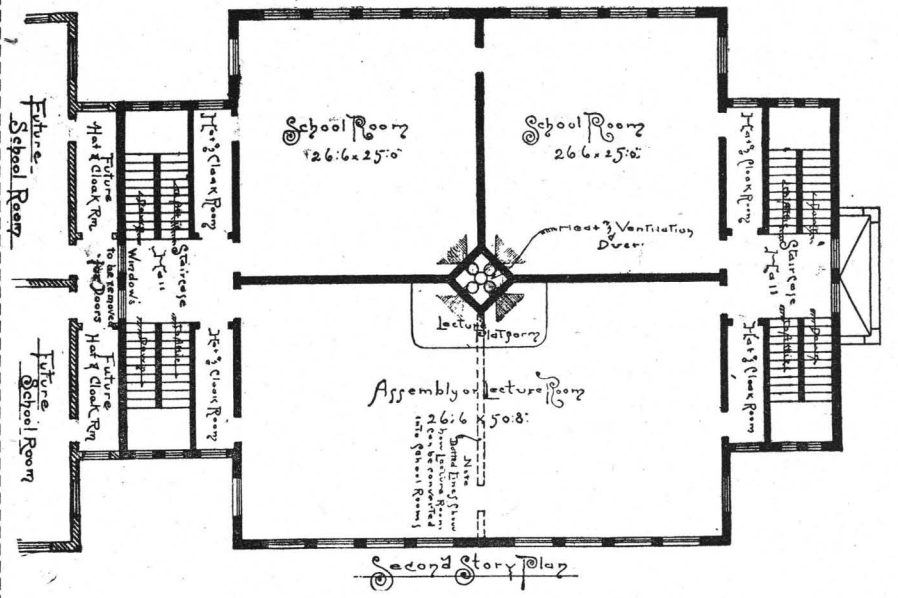
Half Elevation of Bell Cot

Half Section

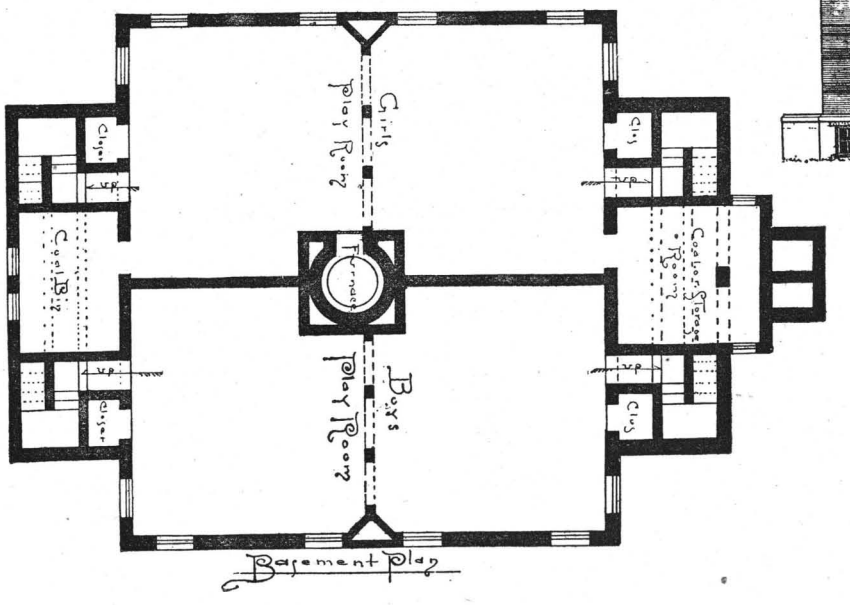
Plan of Bell Cot at different points, showing Trusses to carry same



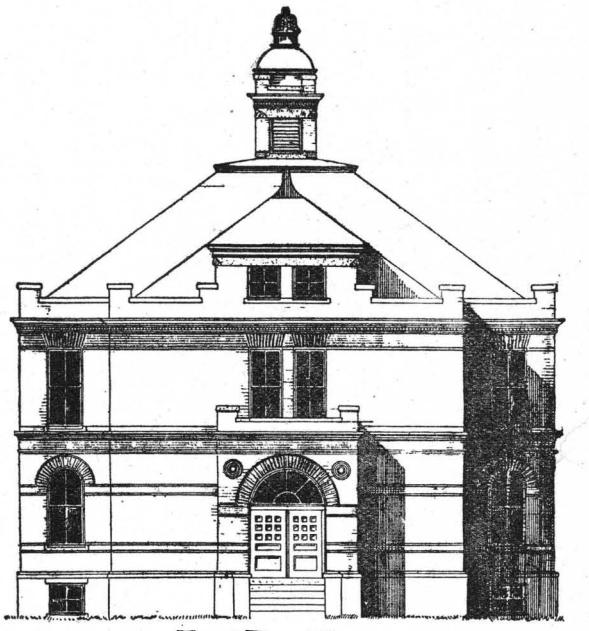
First Story Plan



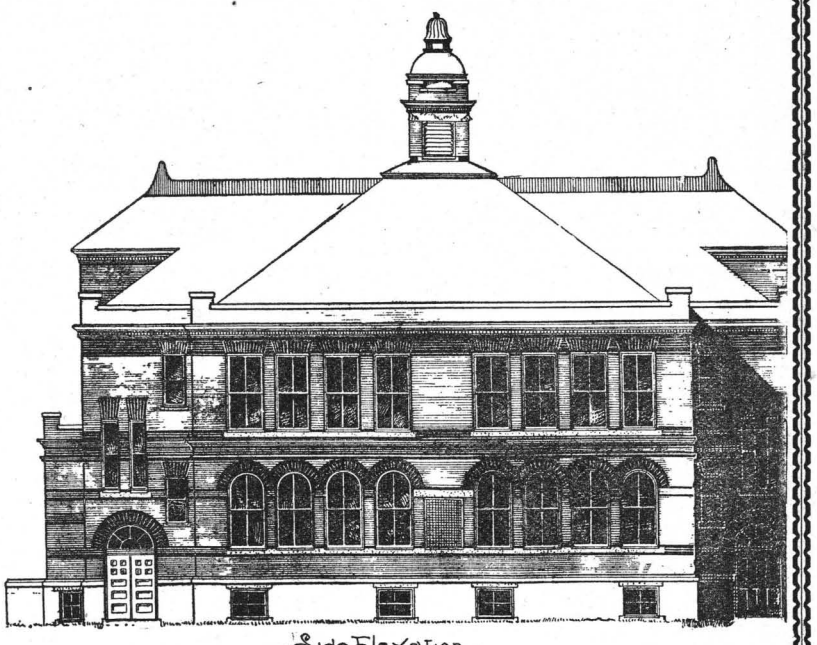
Second Story Plan



Basement Plan



Front Elevation



Side Elevation

Scale 5 10 15 20 25 of Feet

THE BOARD OF EDUCATION

OF THE

CITY OF ELIZABETH, N. J.,

advertised for designs for Model School House, to accommodate 600 scholars, and also to provide large Assembly Room in which to bring the school together, offering a prize of $150 and the work of making full working plans and superintending the erection of the building, at a per cent. on cost of same, to the author of the best design. Seventeen New York architects sent in designs, the one by the Messrs. Palliser being adjudged the best and most practical, and they carried out the entire work under their own supervision, the cost being, for mason, carpenter, painter, slater, and plumbers' work, $23,723.67, and for warming and ventilating work, $4,550.00, making the total contracts $28,273.67, and the building was completed and handed over to the Board of Education without their having to pay a cent for any extra work, it being complete without extras. (*See also pages* 39 *to* 45.)

SPECIFICATIONS

For the work and materials required in the erection and completion of a brick High School Building to be erected at Elizabeth, N. J., on Cherry street lot owned by the city, and according to plans and specifications prepared by Palliser, Palliser & Co., Architects, 24 East 42d street, New York City, and under their personal supervision and direction,

General dimensions, internal arrangements, height of stories, etc., are to be obtained from the drawings, and figures where given to be used in preference to measurements by the scale. Blue, designates stone; red, brick; yellow, wood. The plans, details and specifications are to be accurately followed and to be carefully preserved and returned to the architects at the completion of the work. The contractor shall not make any alterations in any of the drawings or change the work in any way different from that called for by the drawings and specifications. Should any error appear in them it must be referred to the architects for correction.

All the materials to be of the best description for the purposes intended, and the work to be executed in the best, most substantial and thorough workmanlike manner, to the true meaning and intent of these particulars and the drawings referred to, and which are to include everything necessary and proper to the entire work, which is to be delivered up in a perfect and undamaged state at completion, without exception. The mason to provide stoves, etc., to heat the building and take proper care of walls if done in winter time. The carpenter will make all patterns and provide centers on which to turn arches, also suitable protection to all openings, to keep out cold, rain, etc.

Excavation. Do all necessary excavating for walls, areas, foundations, etc., as required by plans; dig the bank well away from walls, and leave open till walls are well set and dry, then fill in and pack in a thorough manner, and rough grade the ground around the building in a proper style, the surplus earth, etc., to be removed from the premises at completion, and the loam to be left on top when finished; excavations for all drain and other pipes to be done by mason, and ground properly filled after same are laid.

Foundations. Build the foundation walls as shown by plans—the footings in all cases to be not less than a foot wider than the walls above same—laid in good lime and cement mortar and the exposed surfaces of the walls in basement to be neatly struck with trowel. Build all area walls in same manner as other foundations, the parts showing to be faced up same as the underpinning. Build all dwarf walls in cold air ducts, etc., as shown, and cement the bottoms of these ducts with good gravel and cement concrete; one of cement to three of gravel laid 2" thick before putting on the rough flag covering, which is to be laid about 1" below the finished level of basement floor. The walls of ducts to be laid up with best quality hard burned bricks in lime and cement mortar, laid tight joints, well bedded and bonded every sixth course.

Steps, etc. The steps, platforms, etc., of all work up to the first floor level to be of best quality North River blue stone; steps to be walled in on each end and to have a bearing of not less than 4"; the porch floors to be flagged in good style and joints to be made tight with cement; the risers of the front area steps and of all steps from grade level to the level of basement floors can be of hard brick as far as practical, those above grade level to be of blue stone. The window sills of basement and belt or sill course at grade level to be of 12" blue stone; also put down flag stones at each side entrance as shown by plans; also furnish all other blue stone as shown by plans, etc.

Brown Stone. The front steps to main entrance, door sill, window lintels, including basement, and all sills, etc., above the basement, to be of brown or other stone, as may be approved, fine crandelled, or tooled and cut as required by plans, washes to be neatly cut and the stone to be set in the best manner possible.

Brickwork. Use good sound hard well-burned brick throughout—laid with flushed solid joints, leaving no empty space in the walls except the air space of 2" in the exterior walls; laid in mortar composed of good lime, cement, and sharp bank sand mixed in proper proportions; all brick walls made level and straight to the proper and exact height, true to a line so the carpenter can size his joists and place them directly upon the wall without blocking up with chips or wood, the wall to have all necessary openings for windows, doors, etc., as shown, also for the warming and ventilation work as required and as directed during progress of the work, also build all necessary brackets for carrying floor beams at flues and do all mason work required in the setting of boilers, placing of warming apparatus, setting of registers, radiators, smoke-flue and the running of steam and other pipes as required to make a first-class and complete job in every respect. Build discharging arches over all openings, brickwork to be well bonded every sixth course; exterior work, to be laid in Flemish bond; outside hollow walls to be well-tied to inside walls by Morse patent wire wall ties, 7 inches in length, 2 feet apart and put in every sixth course, air spaces to be left at the base of these walls, also at the top part opening into the attic part, so as to allow a free circulation of air from basement to attic. Bed solidly all door and window frames after the mortar is dry, take proper care of the work while in progress, and do all mason work in connection with the other work at the proper time, so as to insure the whole coming together in a proper manner at completion.

All brick for facing exterior walls and other exposed surfaces to be of the very best quality assorted hard-burned brick, square and straight in shape, even in color and laid up with red mortar (except the black brick, which are to be in black mortar) and to be trimmed with bands of black brick as shown by the plans and drawings. The black brick to be made out of the same brick as exterior walls are faced with, and by dipping the exposed faces, while hot, in hot coal tar, the face work of all brick walls to be jointed to a straight edge, and other exposed surfaces inside to be struck with a trowel.

Anchors. Furnish and fix all iron anchors, as required for floor timbers, plates, etc., placing same every 6 feet, anchors for beams to be $\frac{1}{2}$"x1$\frac{1}{4}$" iron, and to be well secured to timbers.

Plastering. The entire walls of the first, second and third floors, to be plastered (ceilings and stud partitions being lathed in ordinary manner), one good coat of brown well-haired mortar, laid on straight and true at all points, and to be finished with Francestown soapstone and and lime putty finish, as per directions, in the best manner. The blackboards to be made by applying over plastering of walls above wainscoting, and to strip over in all schoolrooms and assembly hall with the Francestown soapstone patent Blackboard finish; walls to be done equal to sample supplied by manufacturers. Do all patching and mending of walls after other workmen remove all rubbish and masons' waste materials from the premises at the completion of the work. Plaster water-closet, boiler and coal room ceilings, one good coat for whitewashing.

Drains. Put in all drains as shown on plans and in sizes, etc., as marked on same; build the two catch basins and trap the pipes in same. The main drain to be connected to sewer in street at the most convenient point. The drain pipes to be of the best quality cement pipe; joints cemented tight, laid on a true and even grade, using curves and bends for all elbows, and at the grade level and leader connections to be properly pointed around the iron pipes and connections in a thorough and first-class manner.

Whitewashing. The entire walls of basement story and all work of ceilings to be lime-whitened twice in a thorough manner, the lime to be properly prepared, so that it will not rub off.

Cement floors. The boiler and coal-room floors to be laid with cement concrete 2" thick, in a good, true and even manner.

Asphalt floors. The water closets, playrooms, and all the remainder of basement floor not otherwise specified, to be laid with asphalt concrete, not less than 2" thick and finished with a true and even surface, in the best manner possible.

Summary. The mason contractor is to do every and all kind of mason work, furnish the materials for same as needed to fully complete the building fit and ready for occupation, as shown by the drawings and this specification, and to their true meaning and intent, to afford the architects or superintendent the usual facilities for a proper inspection of the work and materials during progress, and shall deliver up the whole of the work called for in a clean, perfect and undamaged state, without exception.

Carpenter's Work.

General conditions at commencement of the mason's specifications to be a part of this specification.

Drawings. The several drawings for carpenter's and mason's use, are to be used by them jointly as needed and kept in a safe place accessible to both, and taken care of, and returned as before mentioned. The detail drawings, notes, interlineations, figures, etc., are a part of the drawings and are to be accurately followed. Carpenter is to do all cutting of wood for other workmen, to make and set centers, put up temporary doors to the building, etc., etc.

Timber. The timber to be of good quality, well seasoned and free from all defects impairing its durability and strength. Timber not exposed, to be of spruce (exterior wood finish to be of white pine) framed in a proper manner, set with the crowning edge upwards. First, second and third floor beams to be 2x14" in size, set 16" centers. Roof rafters, 2"x7", 24" centers; hip and valley rafters, 3"x10"; ridge, 2x12"; collar beams, 2x7", spiked to sides of rafters at each end; plates on walls, 3x12", and for stud partitions, 3x4". Studding for partitions, 2x4, 16" centers. Porch roof rafters, 2x7, 20" centers; also supply all other timber as required by the design and of the requisite sizes and quality, and as required by the drawings. The figures on exterior are on basement plan for underpinning, and on first story for brick walls; heights to be obtained from the sections.

Bridging. Bridge all floor joists in the building every six feet with 2x2 cross bridging, the partitions to be properly bridged twice in their height, headers and trimmers to be 3" thick, and the stair wells, etc., to be properly framed.

Furring. Cross furr the ceilings of first, second and third floors with 1x2 strips 16" centers, well nailed, also do all necessary furring under stairs, around vent ducts at second story ceiling and all furring as may be required; furnish all wood lintels, bond timbers, etc., as required, and see that the mason does his work properly, so that finished work will come together correctly.

Exterior Work. Cover the whole of the roofs with $\frac{7}{8}$" matched boards, not to exceed 8" wide, well nailed to bearings; do all necessary boxing and lining of gutters, set and construct cornices as shown, do all woodwork in and around the ventilator openings, roof, etc., and carry out all woodwork of exterior in a thorough and first-class manner, as shown by the drawings, and to make

a complete and first-class job. The finial on the ventilator to be of either wood or galvanized iron and is to be properly set and secured in position.

Door Frames. Make all door frames throughout for exterior doors of plank and anchor same well to walls, inside door jambs to be made as required, rebated and with transoms over all hall and main doors as shown, and substantially secured in place.

Window Frames. The window frames to be made in size and style as indicated by plans, double hung with Samson Cotton sash cord and cast-iron weights and axle pulleys. Sash to be in thickness as shown, and to have Payson's sash locks on meeting rails; lantern or dormer frames to have suitable lifts, pulls, etc., for operating same from floor below.

Floors. The first, second and third floors to be lined with $\frac{7}{8}$" hemlock boards, surfaced and not over 6" wide, well nailed to the joists and placed diagonally on same, place suitable nailing pieces on sides of walls, and before the finished floors are laid, the linings to be covered with Neponset Red rope fabric deafening felt, on which lay $\frac{1}{4}$x2" strips over each joist, and nailed to same, on which to lay the finished floor. The finished floors to be of $\frac{7}{8}$"x4" yellow pine nailed to every joist with 10*d.* nails to run close to walls around edges, and laid only after the plastering is done and dry.

Grounds. Put up grounds for the finish of all openings, casings, wainscots, etc. set true to a line, plumb, and well nailed and in proper thickness to suit the plastering.

Stairs. Build all stairs as shown by plans, the first and second story stairs to be of yellow pine, $1\frac{1}{8}$" strings; $\frac{7}{8}$" risers; $1\frac{1}{2}$ treads; all properly housed, glued and tongued together, and well secured; these stairs to be ceiled under with $\frac{1}{4}$" boards properly secured, and not to exceed 4" wide and to be neatly beaded. The front stairs to be ceiled on the face string and the rail to be secured to the ceiling stuff; size of rail to be 3". Newel at bottom 7" turned; this handrail to continue from first to third floors as shown; rails on rear stairs to be of iron pipe or 2" ash, firmly secured to the walls with iron holdfasts, the ceiling between the flights of stairs to be $1\frac{1}{8}$" thick put up vertically and to run up from stair to stair, having the necessary framework to stiffen same, as needed; the ceiling to be not over 5" wide and beaded on both sides (the necessary steps in coal room, etc., to be of wood as shown.) Main stairs to have coves under nosings, and the platform to be supported on the necessary timbers.

Casings. The doors and windows to be cased with pine casings as shown by plans, door jambs to be beaded, rebated, etc., as shown and required for doors; windows to have a neat apron and stool finish. The schoolrooms, first and second floor halls, and assembly room to be wainscoted with $\frac{1}{2}$"x$3\frac{1}{2}$" pine ceiling, beaded, the wainscot to run up the sides of stairs; hat and cloak room to run up 5 feet high and finish with a plain cap, the wainscot to have a ploughed shoe, at foot, and chalk trough moulded cap at top, as shown by drawings.

Cloak Room. The hat and cloak room partitions to be of narrow beaded ceiling, set vertical on the necessary framework, leaving a space open 5" above floor and to have doors properly hung and secured inside only, and each hat and cloak room to be fit up with sixty hat and cloak hooks, properly secured and numbered, and the seats to be set in each room as shown.

Doors, etc. All doors to be made in size as marked on plans, to be good panel doors, all outside doors to be hung with Jewett's patent spring butts to open either way, and to be properly secured in center. All other doors to be hung with loose pin butts, three to a door, and secured with a good quality mortice lock.

Blackboard and Picture Moulding. The blackboard and picture moulding to be put up as shown in all the rooms, also in the assembly room.

Washbowls, or Sinks, etc. All to be neatly cased up in the ordinary manner and finished with suitable splash backs over. The water-closets to be properly fit up, seats hinged and fit up in the best manner with hard wood, the divisions between the water closets (boys' and girls') also partitions around water-closet to be made with $1\frac{1}{2}$" ceiling, properly secured to the necessary framework.

Cold Air Inlet, Openings, etc. Construct and set proper frames to the cold air inlet openings, cover same with fine galvanized iron wire netting, arrange a shutter at inside of each opening or duct, so same can be shut off as required, do all required wood work in connection with the warming and ventilation shafts, making floors in base of same; for carrying over the front ducts, also rear ones to the center ones as needed, making the doors and openings at different parts into same and the necessary frames for the shutters, etc., for closing the main vent shaft near top openings and all woodwork as required to fully carry out the entire work as shown and as directed.

Teacher's platforms. Build teachers' platforms in each school room as required, and as directed, to be finished with a nosing and facia, and floors laid same as room floors, to be placed on four castors so as to be easily removed to clean underneath.

Sash. All to be glazed with good twenty-one-ounce sheet glass of second quality (except the small lights in top part of first, second and third floor sash, which are to be in cathedral tints, and the basement sash, which are to be ground glass).

Head-Lights. The head-lights in school rooms also to be glazed in cathedral tints, and the inside head-lights to be hung and properly secured, open or shut, so as to give good ventilation through in Summer time.

Hardware. All to be of good quality. Locks, etc., of Norwalk Lock Co.'s make; bolts to be placed on all double doors, and elsewhere as required. The school-room doors to have locks and keys alike, and all outside doors to have locks and keys alike, front main entrance doors to have bronze knob, etc., on the outside and all other knobs throughout to be mineral knobs, and Japanese escutcheons.

Speaking Tubes. To be put in and fit up complete as follows: all to go to Superintendent's room from third floor hall, from second floor hall and from boiler room in the basement; also fit up one bell from the main entrance door to the principal's room on first floor, with pull to match other furniture, etc.

Summary. The carpenter to do all carpenter work in a good, complete and finished manner throughout, to furnish everything necessary to do the same in the best and most workmanlike manner, and to the full satisfaction of the architects and their meaning and interpretation of the plans and this specification.

Slaters' Work.

The whole of the roofs throughout to be covered with x1 Tunnel, Slatington, Pa., slate, 8x16 or 8x14 in size, laid with a lap of not less than 2" of the third over the first, to be underlaid with Neponset black felt paper. Secure slate to roof boards with galvanized iron nails, flashings throughout to be of heavy zinc, full width, the valleys to be lined with zinc, 16" wide, and slated open, ridges, hips, etc., to be properly covered with zinc, placed over rolls in the ordinary manner; such hips as can be mitered are to be so done, and put together with slaters' cement. All slaters' work to be done up in a good and first-class manner, to be carefully looked over after other workmen, and the work to be warranted for two years from time of completion.

All slate to have cut corners, known as Washington cut.

Tinning Work.

All tin used in gutters, on areaway, roofs and dormers or ventilator to be "old style, genuine stamped and guaranteed" (N. & G. Taylor Co., Philadelphia, Pa.), and all soldered in rosin. The gutters to be properly lined, and the tin run up under the slate at least 6". The four-clock dormer tops and two front area covers to be properly lined with tin, and flashed at sides, walls, etc., and pointed with slaters' cement in the best manner possible.

Leaders. Put the necessary number of standing seam solderless conductor pipe of galvanized iron, 4" in size, firmly secured to the building with patent holdfasts; to have wire screens over openings in gutters, and to be connected with the drain pipes at grade level.

Painters' Work.

Furnish all materials, and perform all labor for the full and entire completion of all painting and finishing of woodwork, the materials all to be of the best kinds for the purposes intended, and of first quality.

Exterior. All exterior work to have two coats of C. T. Raynolds & Co.'s New York, paints; the frames, etc., painted Indian red; sash, white; front and other outside doors, bronze green and Indian red. Tin work to have two good coats of best metallic roof paint.

Interior. All hardwood, such as stair rails, newels, etc., to be filled with Pratt & Lambert's paste filler, and finished with Pratt & Lambert's No. 38 preservative. All hard pine work to have a coat of Pratt & Lambert's light liquid wood filler, and finish with two coats Pratt & Lambert's No. 38 preservative, all as per directions furnished (this does not include floors of rooms and halls). All other inside work to have two good coats of best lead and oil paint, in such colors as directed. The work to be properly puttied, sandpapered, etc., and to be a first-class and finished job throughout, without exception.

Warming and Ventilation.

All the materials used and to be furnished are to be of the best of their several kinds and for the purposes intended, and all work to be done in a thorough, substantial and complete manner, and the perfect operation of the apparatus guaranteed and done to the full satisfaction of the architects and the Board.

Boilers. Furnish two boilers, set and placed as shown by the plans, one boiler to be a 40-horse tubular boiler, which is to be used for general warming purposes, and the small boiler to be a vertical boiler, of such make as may be approved by architects, to be used for summer ventilation only. The mason work in the setting of the two boilers will be done by the mason contractor. The warming and ventilating contractor to superintend the work and be responsible for its proper execution. Boilers to be made in the best manner, chipped, caulked and tested to 140 pounds hydrostatic pressure per square inch, and a certificate of this furnished by some responsible inspector or insurance company. Drill and tap all the necessary holes in the shells for gauges, valves, piping, etc.; properly adjust in the connecting breechings a damper with crank connections; support boiler with cast-iron brackets properly riveted to same and brackets to rest on walls not less than 8" and to have suitable cast-iron plates under each bracket; the smoke chamber to be of proper depth and area and the connection to flue beyond to be of $\frac{3}{16}$" iron and in area equal to area of all the tubes in boiler. The main smoke flue to be of iron, size as before stated, to run up through the brick flue as shown. This pipe to be of No. 12 plate iron, properly riveted, braced and secured in position; the top part of the flue for boilers can be formed by placing in two boiler iron partitions in brickwork or the iron pipe to run clear up through above top of mason work, at option of warming and ventilating contractor. The smoke flue from small boiler to be connected into large flue as shown.

Furniture, etc. The boilers to have all necessary furniture, castings, front grates, ashpit doors, fire doors, gauge cocks (both water and steam), fitted with all anchors, water column regulators and all furniture, fire tools, etc., needed and necessary to make a good and first-class job in every respect, also supply grates of boiler with a hot-blast air draft, to come from the top part of foul air shaft through 10" air supply pipe connected to same and run to the draft door of furnace. All necessary dampers to be put in pipes and proper and suitable provision to be made for the cleaning of same.

Plumbing. Water feed connections for the boilers to be made by warming and ventilating contractor from the water system of the building.

Piping. Start from the boiler dome with 4" main steam pipe, carry this to the first large heating chamber, taking out the necessary connection for supplying the radiators contained therein, then continue with $2\frac{1}{2}$" pipe to the other warm air chamber for supply of radiators contained there. Separate $1\frac{1}{2}$" pipes to be run to each set of water-closets, also to supply the coil up near top of main vent shaft and the steam pipe to supply basement playrooms. The coils or supply pipe for same to top of vent shaft to be arranged so as to be separated from the main work and to be used either with the large or small boiler, as the case may need. $1\frac{1}{4}$" return pipe from this to be put in and connected in like manner to feed; the main return pipe to be 3", branches 1" up to $1\frac{1}{4}$", as required, and in all cases to be connected below water line of boiler, and in as good a manner as possible to use the least amount of pipe, and so arranged that there will be no traps in same.

Relief pipes to be connected with all feed pipes when there is any liability to collect water in same from condensation; these pipes to be not less than $\frac{1}{2}$" in size and properly connected to return pipes back to boilers at a suitable and convenient point so as to let out any such water, and all steam and return pipes in the building to be properly arranged for a free and easy working of the apparatus and to have all necessary open way check valves for a proper operation of the whole.

Radiators. The whole of the radiators throughout to be of wrought iron pipe 1" in size, put together in the best manner possible, the radiators to be carried on the necessary framework of the floor and raised above same in a proper manner. The pipes in radiators to be placed staggering, *i. e.*, one pipe not directly under the other, but under each al-

ternate pipe, and suitable chairs to be placed between same, so as to keep the pipes firmly in position; the indirect radiators for warming or feeding each register or room to be made in three sections, each having its own feed or return pipe with open way valves to control each separately, the sections to be kept 5" or 6" apart, so as to allow a free circulation of air among pipes, and the indirect radiators to be enclosed in No. 24 galvanized iron jackets or casings, with suitable space over top and suitable connection made to the hot-air pipe from same.

Coils on Top of Air or Vent Shaft. The coil of pipe in the top of vent shaft is to contain 450 feet of 1" iron pipe to run around the walls of shaft a few inches from same and to be properly carried or supported, brace stayed and firmly secured in position.

Pipes in Water-Closet.—Each of the water-closet rooms to have 65 feet of 1" pipe placed in position on the walls, properly secured, etc.

Basement Pipes. The basement to have in addition to pipes in indirect coils, two coils of pipe placed conveniently, each to contain 80 feet of 1" pipe properly secured to the walls at convenient points.

Valves, etc. All valves to be of brass up to 2" in size, over that iron bodies and brass trimmings, to be the Chapman Valve Manufacturing Co.'s make, all coils and radiators to each is to have an automatic air valve of Breckenbridge patent, known as Lock pattern, or others equally as good.

Dampers, etc., Cold Air Vent Shafts. Proper dampers to be placed in each cold air duct, near entrances to same, also to each radiator, under same and on top of main vent shaft, just above the coil and below vent openings, the latter to be in three sections, and to be operated by cords from basement. These dampers to be of galvanized iron secured on light wood frames, furnished by carpenter, and to be properly fixed for opening or closing same as required.

Note. Care must be used in putting in the work so as to have the lowest part of any radiators not less than 3 feet above the water line in the boilers. This is absolutely necessary to a free and easy working of the entire apparatus.

Connections, etc. All connections to stacks to be made with right and left hand couplings or running thread with lock nut (no unions to be used), and the entire connections to be made in the best manner possible and to make a full and complete job in every respect. All pipes to be properly protected against frost in any exposed places, by packing or covering with asbestos or mineral wool and all horizontal lines of piping, where not on walls, to be suspended on iron hangers, yokes or chains, so as to allow for expansion and contraction. Wherever any pipes come near woodwork, protect same by packing with asbestos or wool, or by bedding in plaster 1½" thick, as may be most practical.

Tin Piping. All the tin warm-air pipes to be made with heavy bright two XX tin, properly connected to tops of radiator jackets and to the different warm-air registers in the building. Solder all joints in these pipes perfectly tight, and make the connections so there can be no escape of warm air except through the registers at top ends into the different rooms—the top ends of warm-air pipes to be enlarged as required to fit into the registers, so openings in register faces will equal the total area of warm-air pipes, and a damper to be placed in each pipe just below register and a cap over register so that the damper can be closed and the cap opened, and the incoming fresh air register used in summer time for a vent register.

Registers. All registers to be good flat-faced registers of the Tuttle & Bailey Manufacturing Co.'s make, finished in a neat manner, to have cords, etc., to open and shut, to be secured in position with screws into a wood frame ⅞" thick, properly built into walls, etc. Ventilation registers to be about 20" high as far as practical, set close to floor and properly secured in place as above-named.

Mark each hot-air pipe or nest of radiators for the rooms they are connected with, also the main valves, etc., so as to enable janitor to understand and make no mistakes in turning on or off as required.

The sizes of hot-air pipes, registers, number of feet of radiating surface required to each room, hall, etc., when not otherwise specified, to be as per schedule given here, and the entire apparatus to be delivered up in complete working order, tested, proven, and the warming and ventilating contractor to guarantee the whole of his work for one year from the time of completion, and to do all repairs needed within that time, and to warm the school rooms in the building at breathing level to 70 degrees Fahrenheit, in 6 below zero weather to warm the halls to 65 degrees, and playrooms, etc., in basement to 58 degrees in zero weather.

Number of feet surface of steam pipes in radiators, sizes of tin pipes, registers for incoming fresh air and outlet ventilation registers to be as follows, and the warming and ventilation contractor to see that the masons leave all openings for registers and pipes as the work goes along. The registers for all warm-air inlets to be single registers, while those for outgoing may be in two or double, these latter to be set as near floors as can be, and so arranged that one-half can be closed as required.

Basement. To have direct radiation as before specified, and two indirect of 150 feet each, pipes of tin 16" diameter. Registers for incoming air, 250" area, and for registers for outgoing, of 250" area each. The water-closet vent registers to be through 12" galvanized iron pipes, and each register to be 168" area, the galvanized iron pipes for vent of water-closet to run, and connect into vent flue, through which runs the smoke stack from boilers.

First Floor. Halls to have three nests of radiators, each with 150 feet of heating surface, pipes 15" diameter. Registers, 250" area for incoming air and to have 6 outlet registers, each of 175" area.

Schoolrooms, 25x26, to have each 325 feet of radiating surface, 24" warm-air pipes, and 609" incoming registers, and for outlet registers 800" area.

Principal's room to have 100 feet radiation, 14" warm-air pipe, 200" incoming register, and for outgoing 275".

Front corner room for library to have 225 feet radiation surface, 20" warm-air pipe, 410" incoming register, and in outgoing 525."

Second Floor. Hall to have one nest of radiators; pipe and registers for incoming air, same as on floor below, and to have three outlet registers, each of 125" area. Schoolrooms, 25x26, to have 300 feet radiation surface, 22" warm-air pipes, 525" area for registers, and for outlet registers, 750".

Third Floor. School room in rear to have pipes, registers, etc., same as second floor. Assembly hall to have two nests of radiators, each with 440 feet surface, 18" warm-air pipes, 650" incoming registers, and 825" outgoing registers. For heights of outgoing registers, as far as practical, reference is made to figures named in other part of this specification. And the incoming fresh-air registers to be placed about 8 feet above floor level, and to be about square in shape. All the necessary tin work in lining the floors over cold-air ducts, in warm-air chambers, lining insides of doors in chambers and vent shafts, and when carried over into the main shaft, to be done by the warming and ventilating contractor, in a proper and first-class manner, and all work herein referred to is to be done with good and first-class materials throughout; to use every care in putting in his pipes and work, so as to make a success of the entire work; to make no changes in the sizes or arrangement of the work as herein specified and named, unless by written consent of the architects, and to refer all points not understood to the architects for consultation and to be governed by their decision in all things pertaining to the work, and to furnish everything necessary to put in the entire work; to make a full and first-class job in every respect, which is to be thoroughly proven and tested by the architects before it can be accepted.

Plumbing and Gas-piping.

The pipes for water service to be put up on one-inch thick strips, prepared by the carpenter, also the carpenter is to do all woodwork in connection with the plumbing and piping of the building. All lead pipes to be secured with hard metal tacks and screws, and all lead connections to iron to be made through brass ferrules, soldered to the lead and calked into the iron.

Water Supply. Tap and pay for tapping mains in street connect and from this point lay 1¼" galvanized iron pipe to supply the building. Place a stop-cock and box at the sidewalk, also at inside building, in a convenient location; this pipe to be branched into two ¾" galvanized iron pipes to supply the boys' and girls' water-closets; also put on a connection for use of boilers at a convenient point. Each branch to have a separate stop-cock, so that one line at a time can be cut off when needed, and all other stop-cocks to be as required to make a first-class job.

Iron Soil Pipes. Connect with drains at outside of the building, on each side rear wing, with 5" iron pipe, running to and connecting the cast-iron sinks under each row of water-closet seats, and connected to same with 4" branch pipes, each to be properly trapped and connected.

Privy Sinks. The sinks to be Mott's No. 2 cast-iron privy sinks, in two sections each, and to have patent overflow plug and lever attachment for emptying same; to be supplied with water through ¾" galvanized iron pipe and fit up in a complete and first-class manner.

Soil Pipe. The soil pipe to be of cast-iron, tar coated on both sides, and the pipe to be continued through and under the floor and to outside for conductor connections as shown. Also put in all necessary branch pipes for teachers' water-closet, sinks, urinals, etc., as required; all connections being made with one-eighth bends and Y branches and joints to be caulked, tight.

Urinals in boys' water-closet to be of iron, painted, Mott's Plate 258, and in length as shown by plans; to be supplied with water through perforated galvanized iron pipe, to have connections trapped and fitted up in a complete and first-class manner throughout and left ready for use.

Sinks. To be of cast iron galvanized, having iron legs, supplied with water through ½" galvanized iron pipe and compression brass draw-cocks, and to have 1½" wastes with S-traps properly connected to iron pipes.

Wash Bowl in the teachers' toilet room to be of Wedgewood ware, 14", with marble countersunk top and surbase, supplied with water through ½" pipe and Broughton's Patent nickel-plated self-closing draw-cock; to have 1" waste, properly trapped and connected.

Teachers' Water-Closets, as shown, to be fit up complete, to be Boyle's Cascade water-closets with patent drip trays and connected to drain through 4" iron pipe and S-trap, to have water through ½" pipe of galvanized iron and each to have a separate cistern and stop-cock to control supply of water to same, and each water-closet to have a 3" galvanized iron vent pipe from vent opening to run and connect into vent flue around boiler smoke pipe.

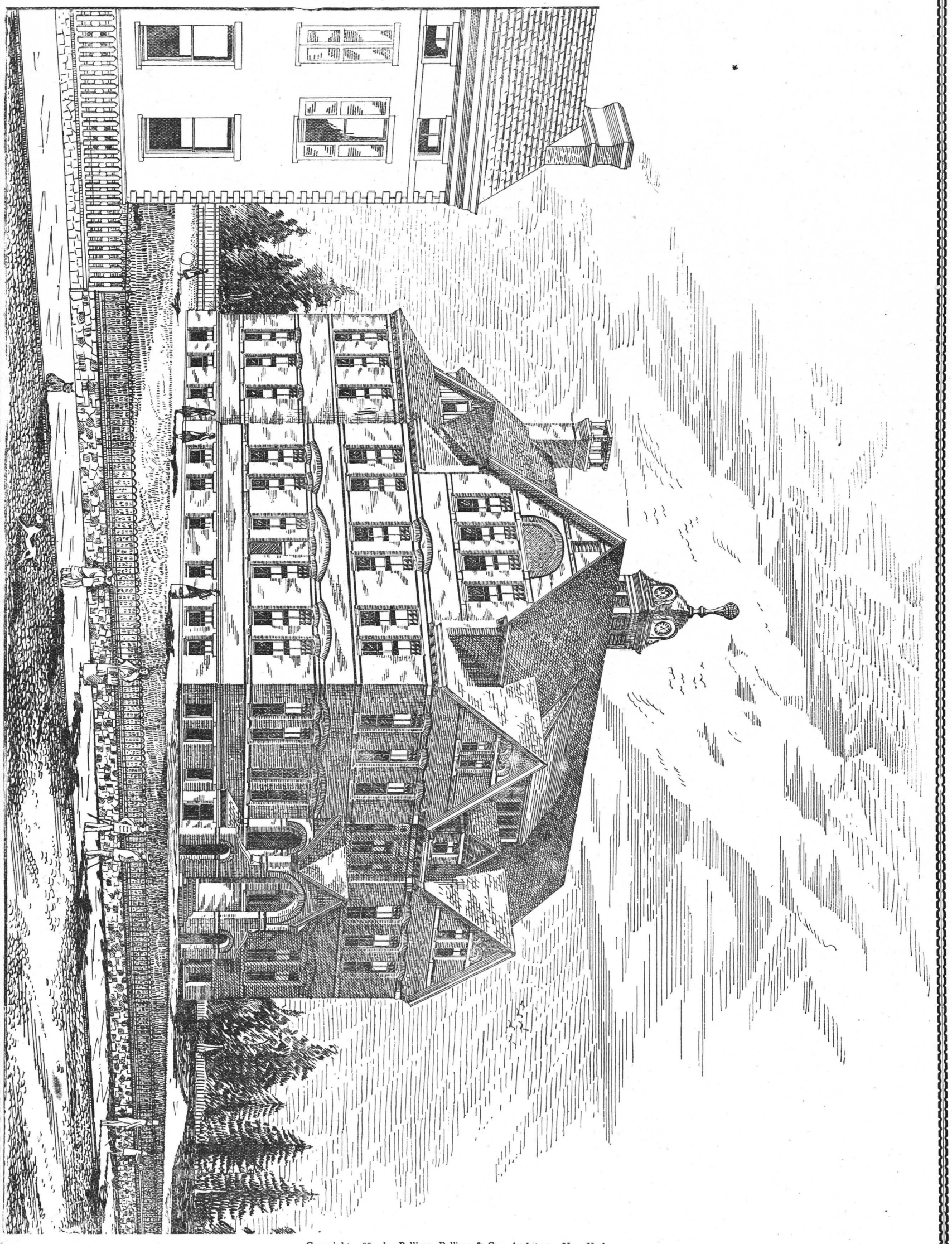
Drinking Fountain. The drinking fountain on first floor to be of iron, enameled; to have waste of 1¼" iron, properly trapped and connected to the soil pipe or drain; this to have water through ½" pipe and a nickel-plated Broughton's self-closing cock. Mott's Plate 489 will answer for above in absence of anything to fit recess in wall, and to be fit up complete in every particular.

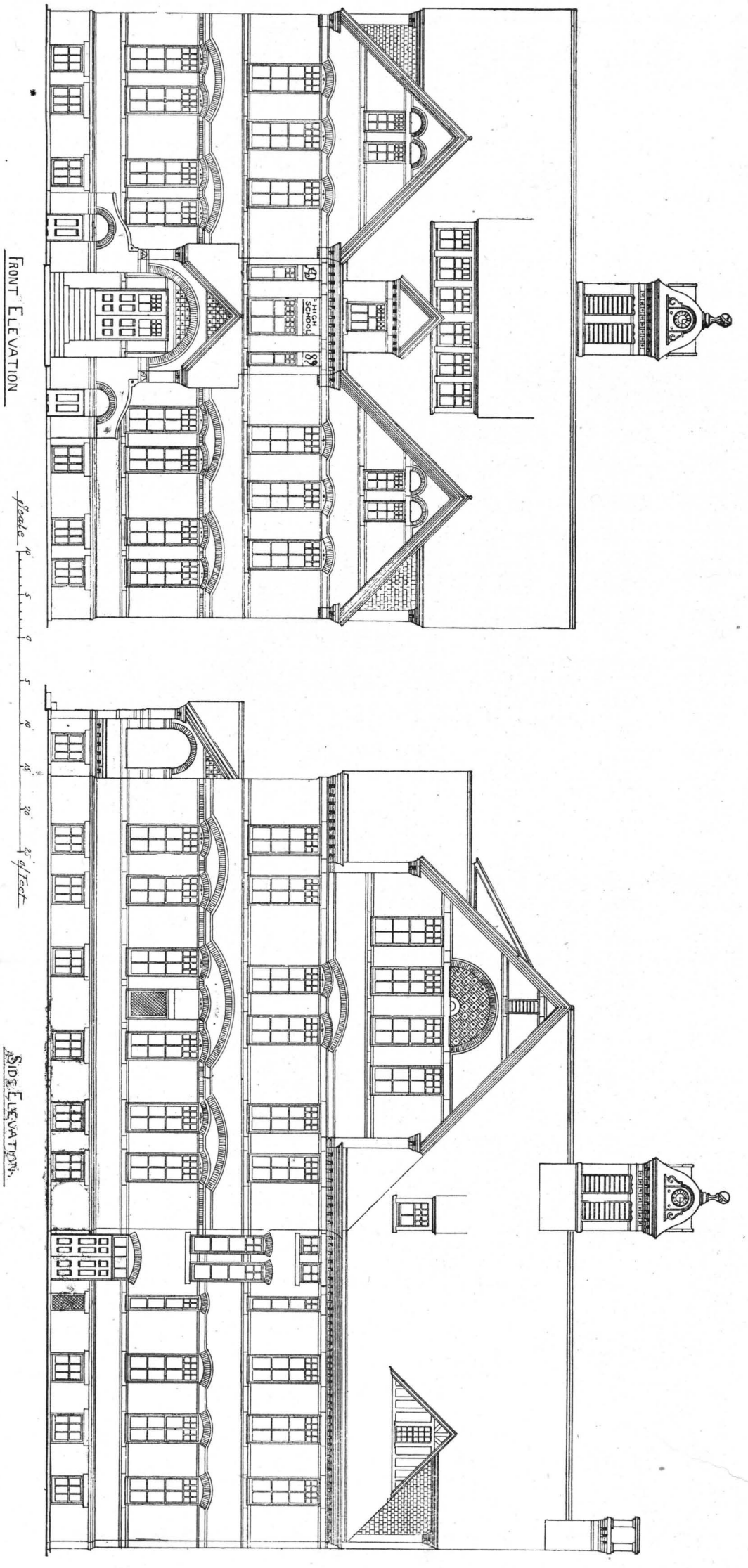
Cesspools. Place two cesspools, one in floor of each water-closet, to be Mott's Plate 52, 9" square, with bell traps and to be properly connected to the iron pipe in the best manner; these cesspools to be set and placed in position before the floor is laid, and proper provision be made for a grade so water will drain away properly.

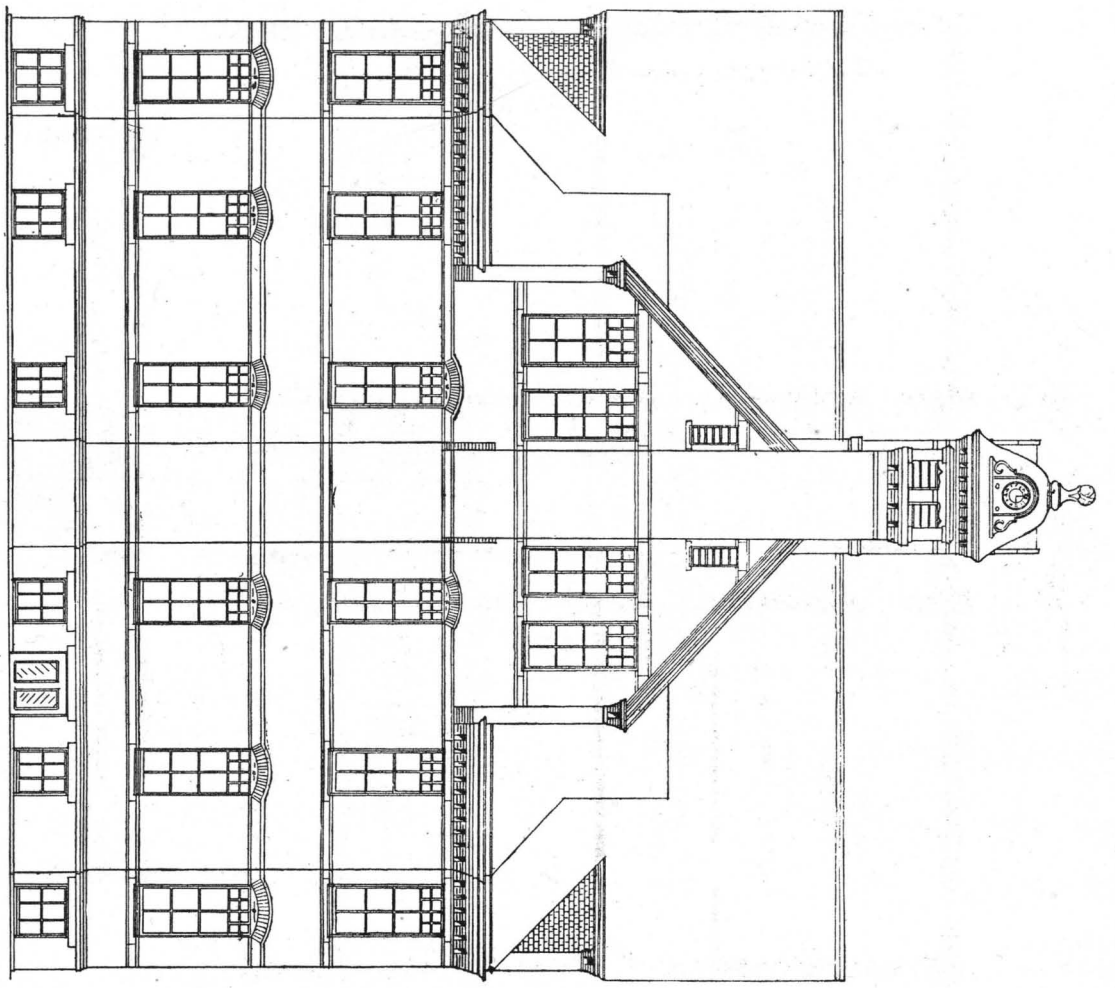
Hose Connections. Two pipes to be arranged (one in each water-closet, and provision so hose connection can be made to wash out basement and water-closet floors.

Soil Pipe. All pipe inside the building to be iron pipe, caulked joints, two of the conductor connections in rear to be made to the iron pipe, all traps to be perfectly ventilated and such vent pipes to run up through the roof, pipes out through roof to be not less than 2" in size and properly capped with galvanized iron ventilators, and all vent pipes from traps to be of wrought iron, where less than 2" in size, and if 2" to be of cast iron.

Gas Piping. Run gas pipes throughout the building for burners in all rooms, halls, etc., as shown by plans or as directed, the pipes to be put in as required by the rules and regulations of the gas company. The piping to be secured substantially in place with iron holdfasts and drop outlets, secured with iron straps and screws; the street connections to be run into the building, and the whole piping to be capped, proven tight and left ready for meter and fixture connections.

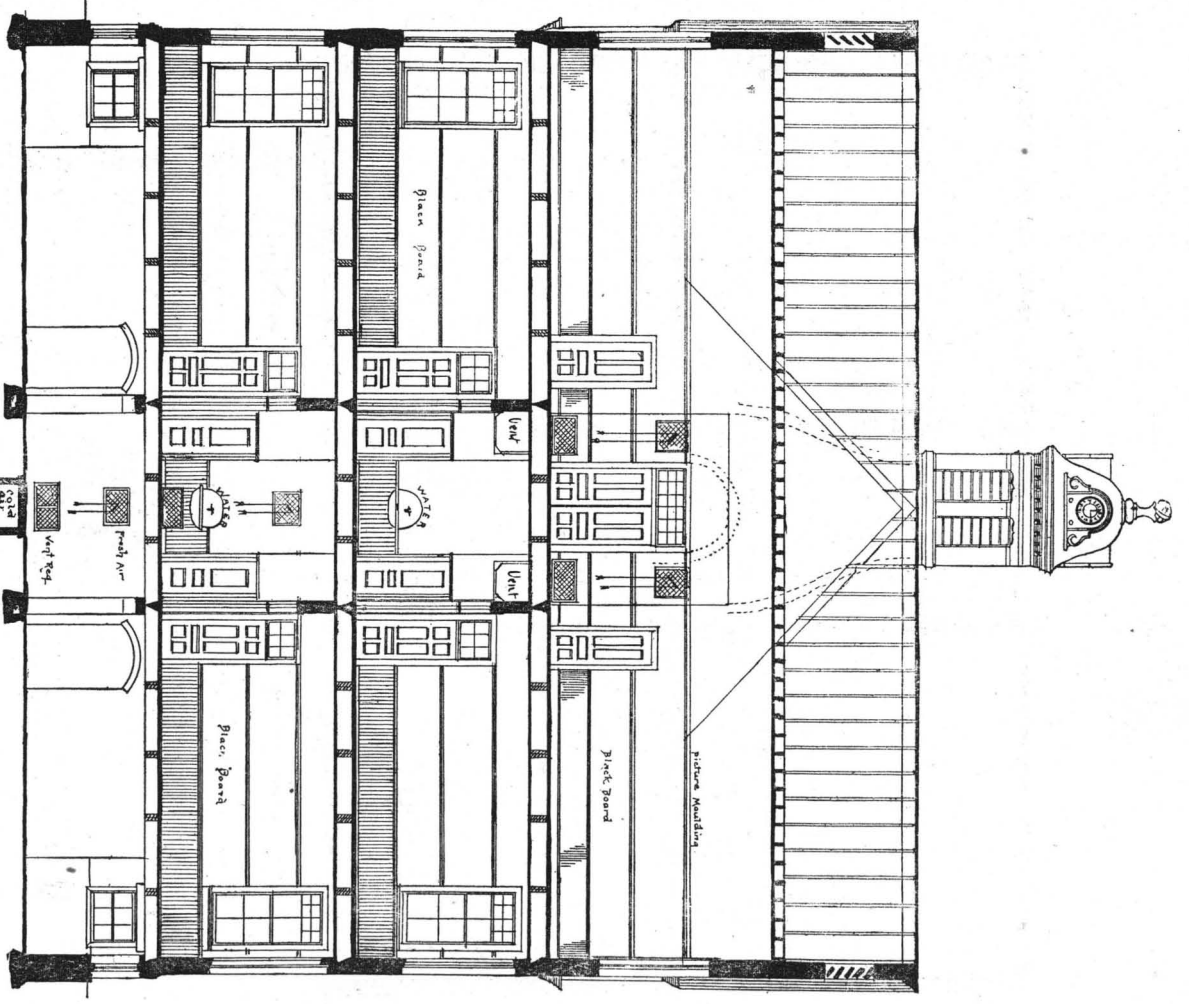






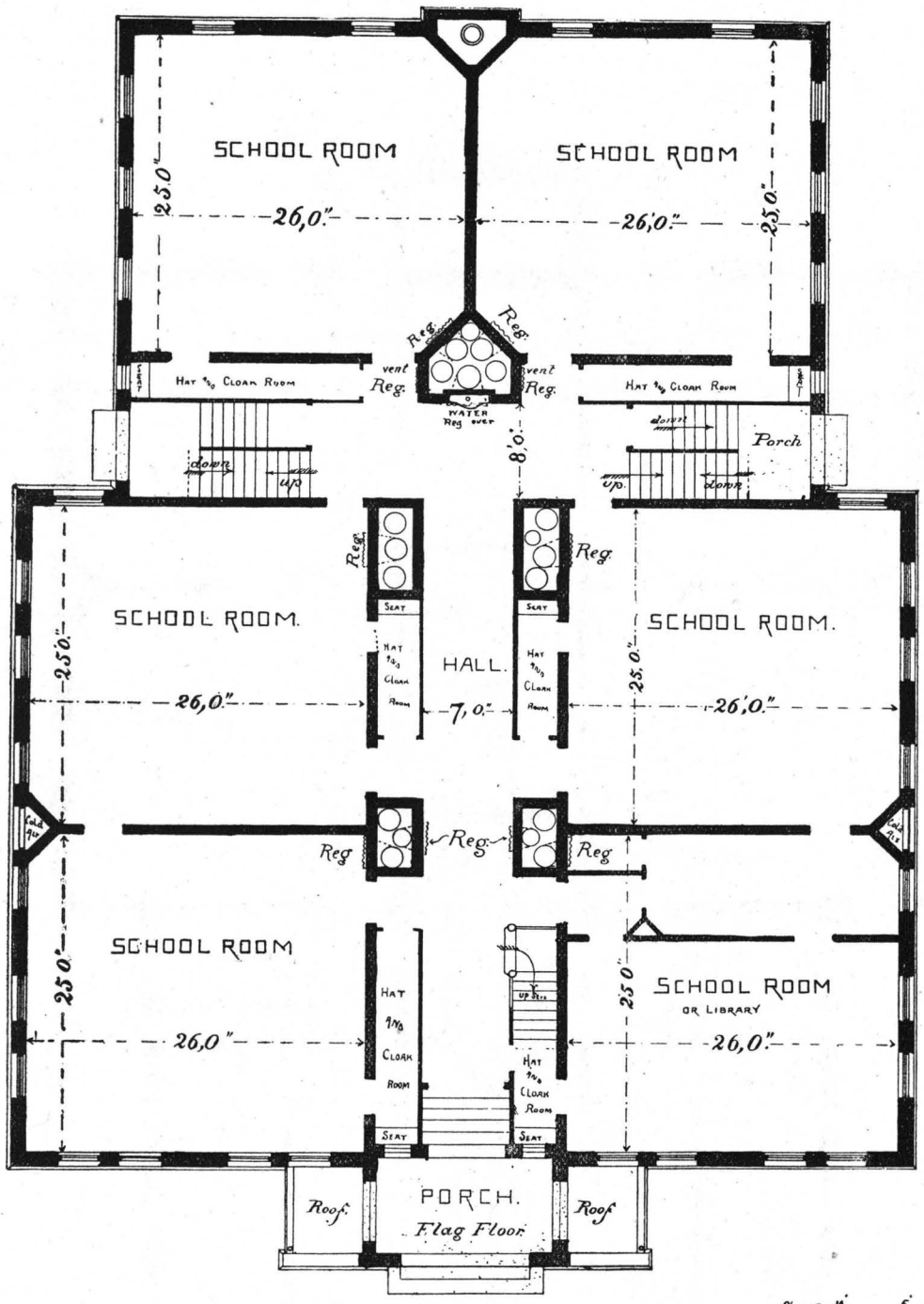
REAR ELEVATION

Scale 15' 0 15' 30' 45' of Feet

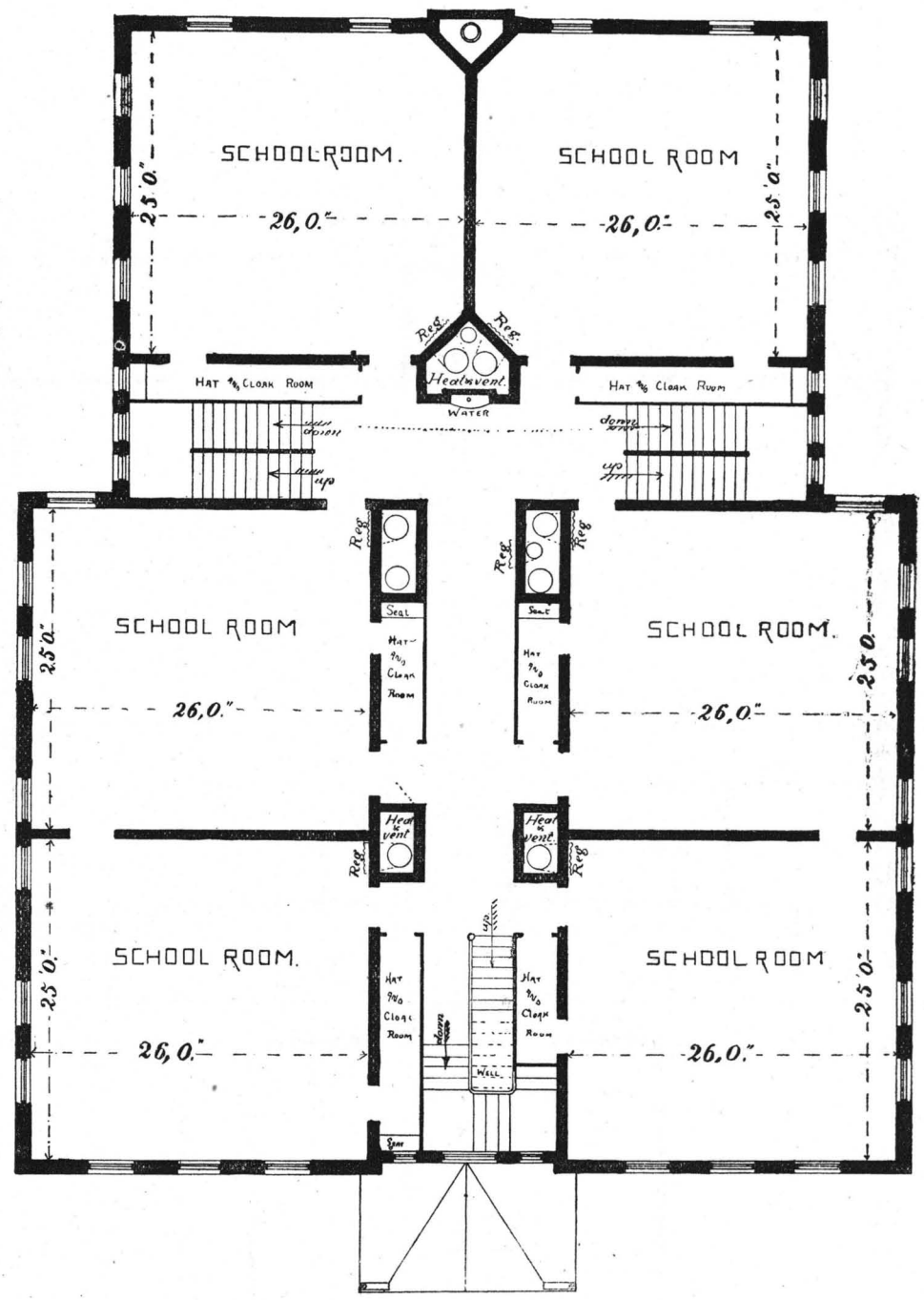


CROSS SECTION

Cherry Street High School at Elizabeth, N. J.



FIRST FLOOR PLAN.

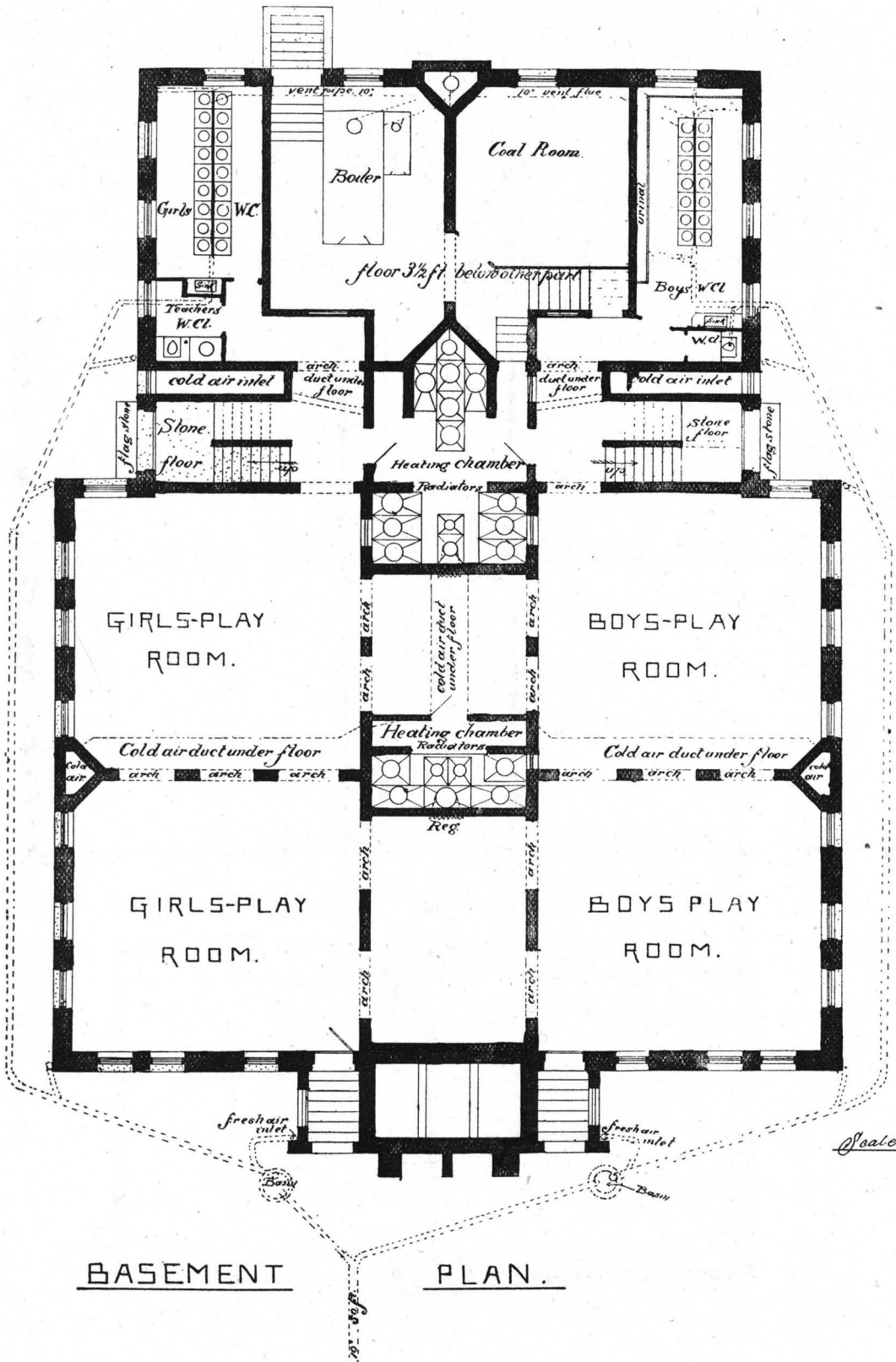


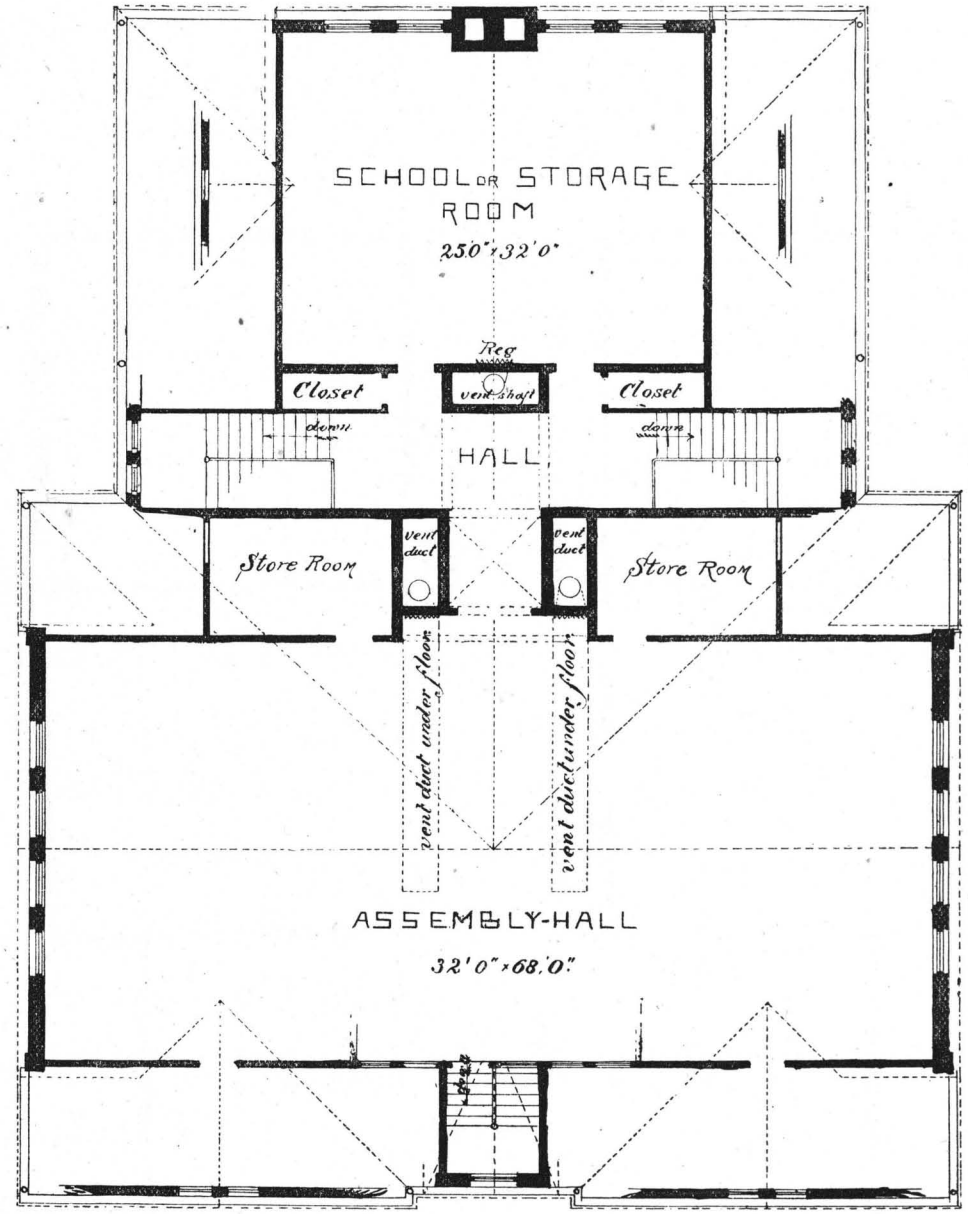
SECOND FLOOR PLAN

Scale 1" 5' 0' 5' 10' 15' 20' 25' of Feet

45

Cherry Street High School, at Elizabeth, N. J.





Scale 10' 5' 0' 5' 10' 15' 20' 25' of Feet

THIRD FLOOR PLAN.

PLATE 31.

PLATES 32 TO 41.

Several of the designs shown on the following plates were prepared in accordance with instructions sent out by the Department of Public Instruction of the State of New York in 1887, but owing, at the time, to a combination of circumstances, they were not completed in time to be sent in to the State Capitol at Albany, so as to enter the competition, but were subsequently finished, and since that time have been examined by a number of School Trustees visiting our office for the purpose of having plans prepared, and many valuable suggestions have been obtained therefrom.

Comparing them with the designs that were awarded prizes in the above-named competition, and with the others which were commended, though considered of insufficient merit to warrant a prize award, the designs we here present are in every respect 'Models," and if they had been submitted with the others in competition, they would, without doubt, have carried off a number, if not all of the prizes offered, as they are vastly superior to any of the 58 designs sent in from all parts of the country, mostly by draughtsmen and the coming architects, and it is much to be regretted that the terms of the competition and the importance of the subject did not attract the attention of some of the leading architects of the United States, but it is quite evident that they did not.

'T is well known that the swell society architects care nothing for such matters, as it would not pay them to have their $5,000 a year managers and chief designers, who are really the brains of their offices, wasting valuable time over such small affairs, besides if they did, the chances are they might be beaten by some of their less pretentious fellows, and that would be dreadful, don't you know; many architects will not enter even a thoroughly fair and well-conducted competition, for the reason that they are afraid they may be distanced by some lesser light in the profession.

Hon. A. S. DRAPER, the New York State Superintendent of Public Instruction, was authorized and directed by Chapter 675 of the Laws of 1887, to procure architects' plans for a series of School buildings, ranging in cost from $600 to $10,000. It also directed him to accompany them with suggestions in relation to the preparation of the grounds and the arrangement of a School building, with reference to lighting, warming, ventilating, and the health and convenience of teachers and pupils, and then to publish the whole in convenient form for distribution to village School Trustees and others having use therefor.

(Every State should appropriate $2,500 to $5,000, and procure from the very best School Architects and experts, and publish in book form, Model School House Designs, plans, working drawings, details, specifications, with all the latest available information on the subject, together with the necessary advice to the Farmer, or the village Shoemaker, Carpenter, &c., &c., who make up the School Trustees, and who will persist in knowing it all, meddling in matters they know nothing about, and preparing specifications and plans for School Houses, and having them erected, without consulting an expert at all, but believing entirely in their own capabilities in such matters; resulting in the most disastrous effects toward the eyesight and the health of scholars and teachers, to say nothing of the exterior show. We have watched with disgust the growth of School buildings under just such circumstances, and have felt over and over again, the necessity of enacting a law in every State, making it a punishable offence, by death, in every case of these idiots attempting to build a School House, without first securing the very best experts' service and professional advice to be had, in carrying out the same.)

Acting under this statute and with a desire to carry out its manifest purpose to supply school officers with the most modern and artistic plans or designs for the erection of low-priced school-houses, as well as with the latest and fullest information upon the general and important questions relating to the carrying out of the same, the State Superintendent, by circular dated September 20, 1887, invited the architects of the country to present in competition, plans and specifications for school buildings of different sizes and cost, and used a portion of the sum appropriated in said act for the purpose of providing prizes for the most meritorious designs.

Two prizes were offered in each of the various classes. To the designer of the best arranged and most complete building in Classes 1, 2, 3, 4, and 5, respectively, the sum of $100; and to the designer of the next best in each of said classes, the sum of $50; to the designer of the best and most complete building in Class 6, the sum of $150; and to the designer of the next best, the sum of $75. The right was reserved to make no award in any class where the design presented was not sufficiently meritorious, in the judgment of the Committee, for the use indicated. The Committee consisted of one Architect and six School Teachers.

The movement proposed was undertaken in the hope that it would result in more attractive and comfortable low-priced school-houses in this State. For reasons which will appear obvious upon reflection, there has heretofore been but little done in this direction. At the popular centers the buildings are generally fair, and when new ones are erected they are ordinarily very creditable. But outside of the large communities many of the buildings are truly wretched, erected without any idea of architectural effect, and entirely regardless of those matters upon which the health and comfort of the pupils mostly depend. Old buildings, in a shameful state of decay, are continued in use year after year. When new ones are erected it is considered unnecessary or too expensive to employ professional help, and so the best results are not secured. We are endeavoring to arouse and educate public sentiment upon the subject. We are telling the people that the health and eyesight and comfort of teachers and pupils are worth caring for. We are striving to impress upon them the fact that neat and wholesome buildings in themselves exert a strong moral and educational influence. It is believed that we can do this most effectively by placing in their hands the most meritorious designs, the latest information, and the best helps. Showing them just how to do a good thing will accomplish more than simply telling them they ought to do it.

The committee appointed to examine the plans offered in the competition for designs for low-priced school-houses, presented the following report, while at the same time they awarded the prizes or named those they deemed as worthy of mention.

Fifty-eight designs were offered, distributed in the various classes, as indicated below. Of these, many were so radically defective in the matter of lighting, heating, ventilating, design, or general arrangement, as to preclude the possibility of a favorable consideration. Of those which met with approval, several are, in the opinion of the committee, beyond the limit of cost, reckoning materials and labor at the lowest market prices. This conclusion we reached after employing competent experts to compute the exact amount required, reckoning materials and labor at the lowest prices ordinarily found in the State. These plans could, therefore, receive neither prize nor honorable mention, which the committee deemed it was permitted to bestow only on designs strictly conforming to the letter of the instructions contained in the circular. We have, however, taken the liberty of mentioning with special commendation certain of these designs, at the same time indicating their probable cost.

In the first class (frame buildings to accommodate from twenty to forty pupils, at a cost not exceeding $600) eleven designs were submitted. A first and second prize was awarded to designs in this class.

In the second class (frame school-houses to accommodate from forty to sixty pupils, at a cost of $1,000), eleven designs were submitted. A first and second prize was awarded to designs in this class.

In the third class (frame school-houses to accommodate from sixty to one hundred pupils, in two rooms, at a cost not exceeding $1,500), seven designs were submitted. Only a first prize was awarded in this class.

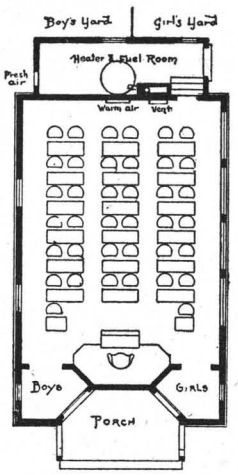
In the fourth class (frame school-houses to accommodate from one hundred to one hundred and twenty pupils, in two rooms, at a cost not exceeding $2,500), eleven designs were submitted. A first and second prize was awarded in this class.

In the fifth class (frame or brick buildings to accommodate from one hundred and twenty to one hundred and seventy-five pupils, in three rooms, at a cost not exceeding $5,000), six designs were submitted. No prize or even an honorable mention was recommended in this class. All the designs were considered defective or impracticable.

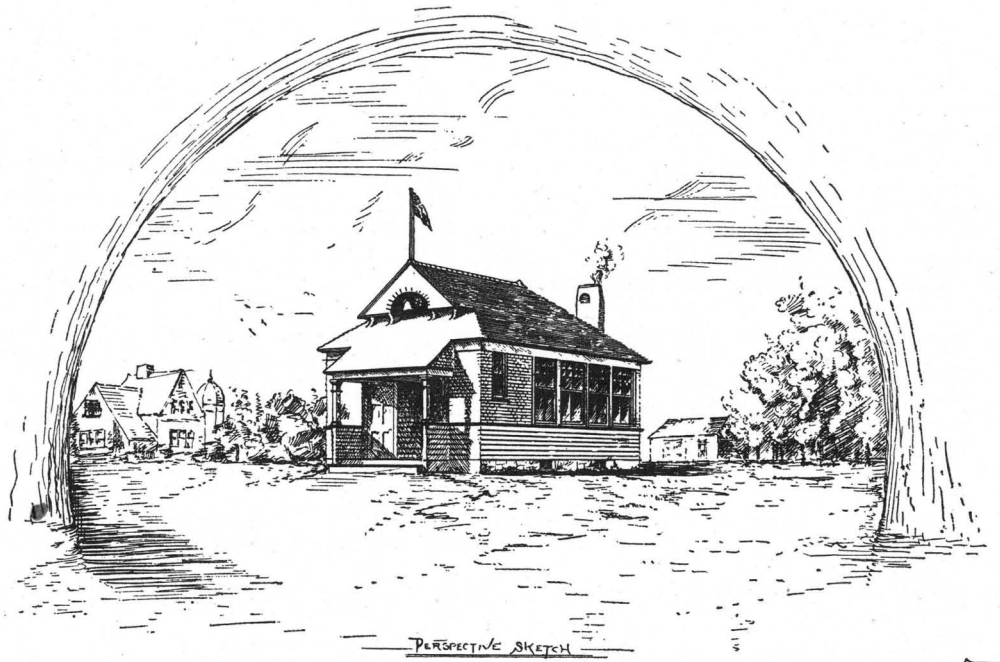
In the sixth class (brick buildings to accommodate from one hundred and seventy-five to two hundred and fifty pupils, in four rooms, with an exhibition hall, at a cost not exceeding $10,000), twelve designs were submitted. In this class no prize or honorable mention was awarded, all being impracticable or in other respects bad.

In the writer's opinion this proceeding was a farce and fizzle, and it would have been far more profitable and better in every way for the State of New York, if they had omitted the question of a competition altogether, and instead sought out, employed and paid, say $1,000, to the best and most practical and expert school-house architect, and if one was not to be found on this side the Atlantic then on the other, and had him prepare them the desired plans and matter for publication, which should also have embraced positive instructions, having no uncertain sound, to School Trustees, as to their proper course in the conduct of such an important matter as the design, arrangement and sanitary construction of a school-house.

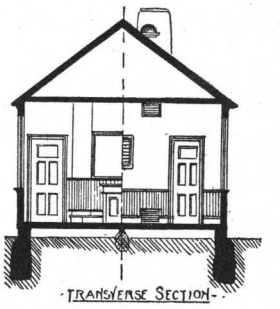
What is the use of a State Department of Public Instruction, we ask, if it fails to instruct the people properly what it is their bounden duty to accomplish, in this regard, for their children?



FLOOR PLAN

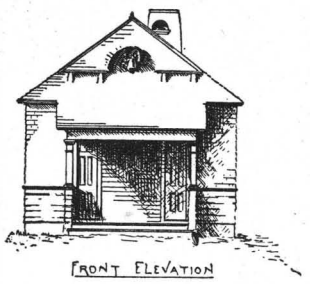


PERSPECTIVE SKETCH

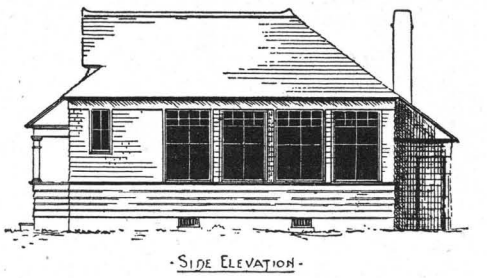


TRANSVERSE SECTION

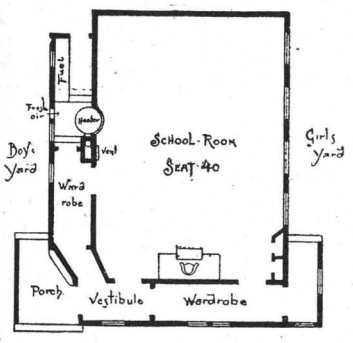
DESIGN
FOR
$600 SCHOOL HOUSE CLASS 1
BY
PALLISER, PALLISER & Co
24 E. 42 St
New York



FRONT ELEVATION

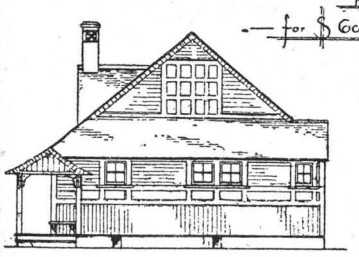


SIDE ELEVATION

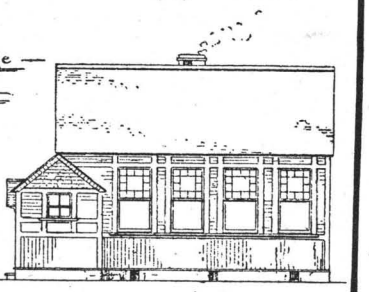


Perspective View

Design
for $600 School-House
Class 1

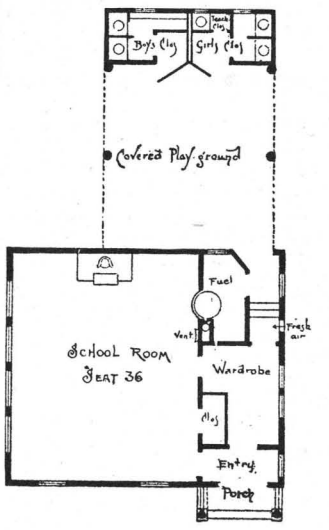


Front Elevation



Side Elevation

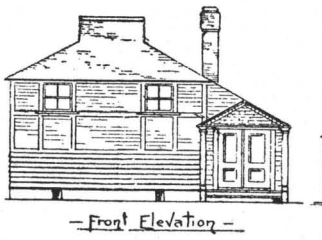
Palliser, Palliser & Co - Architects
24 E. 42nd St New York city



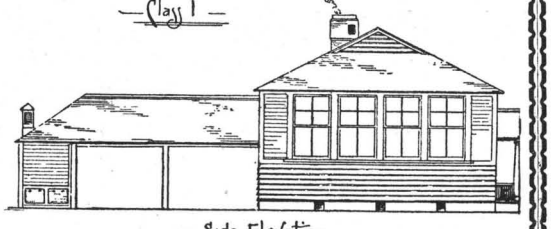
Palliser, Palliser & Co - Architects
24 E. 42nd St
New York city

Perspective View

Design
for $600 School-House
Class 1



Front Elevation



Side Elevation

SAVE THE NATION

By Carefully Moulding the Moral Principle of its Children.

We doubt if there is any other portrait of any other individual in the whole world worshipped by so many people as that familiar head of Washington, with its fine features, loving eyes and its mouth so familiar to all.

There never was king or potentate of any sort so truly loved adown the centuries, so honestly honored, as that good man and great soldier, the first President of this great Republic, and there never will be.

The Father of his Country should look down upon the children of every School Room in the land.

We should all know George Washington by sight as well as though he walked the streets to-day, and we could look upon him from our windows Washington was the only true patriot who ever lived, for he is the sole character in history who sought nothing for himself, who thought solely of his country's good and declined honors which were laid at his feet by those who adored him.

Doubtless you have often heard the question: "What is a gentleman"! How shall we define the word? As you gaze at that beloved face upon the wall, you may truthfully say: "There is no better illustration of the word than George Washington, none who felt so thoroughly the distinction of the title, and did his best to merit it. There is upon the record of his life no action in which he forgot that he was one. It begins with the story of the cherry tree. The little gentleman could not lie. It goes with him through his domestic relations. His love and honor for his mother, his truth and tenderness to his wife, his unfailing remembrance of the duties of friendship. It was at the bottom of his resignation of that at which most men in his position would have grasped greedily."

A Christian and a gentleman was he in the highest sense in which we can use those words, and if more men were these at heart, we might hope for future patriots as true, if not as great as he.

Let George Washington's portrait hang upon the wall of every School Room in the United States, and let his story be written, so that every American boy may read and understand it and make him his model, and let the Stars and Stripes of America float over every School House in this free country.

What has brought about the present existence of so much prevarication, fraud and dishonesty in all the dealings of the people of the United States whether in matters of Church, Law, politics or business, in fact in every walk of life men supposed to be honorable, on every hand betray the trusts confided to them from the least to the greatest.

The cause is lack of moral principle and lust for gain, too much haste to get rich without regard to the methods employed amongst the people who make up this nation, a lack of that moral training so essential in the rearing of children and an unjust and idiotic discrimination in the administration of the law, allowing young men and others through wealth, influence and political pull to escape punishment for wrong doing while the poor are severely punished for every petty or technical offence or foolishness for a want of actual knowledge as to its being wrong at all, the law being neither plain or common sense but the result of lawyers (our legislators) technicalities and quibblings so that no one can find the law, not even the lawyers and judges themselves, being framed purposely so that it is impotent and so that the same can be bought and sold at a certain price; which is done everywhere openly and without shame, and woe to the poor man who cannot buy as in this regard only appears to be his crime; the Americans are fast becoming a lawless breed, ready to wink at one evasion of the law if they themselves profit by another, and they are constantly grinning over the details of clever frauds. The writer once heard a successful limb of the law make this statement: "A successful evasion of the law is equivalent to living up to it." The Cabinet officer and the heads of the political machine openly break the law for their own personal benefit and before the faces of the whole people who applaud, call it smart, and would do the same themselves if they were in their places.

"The Popular Credo," written 30 years ago, which we give below, appropriate then, appears to be far more so now and still growing in favor.

Dimes and dollars! dollars and dimes!
An empty pocket's the worst of crimes!
If a man is down, give him a thrust—
Trample the beggar into the dust!
Presumptuous poverty's quite appalling,
Knock him over! kick him for falling!
If a man is up, oh! lift him higher—
Your soul's for sale and he's the buyer!
Dimes and dollars! dollars and dimes!
An empty pocket's the worst of crimes!

I know a poor, but a worthy youth,
Whose hopes are built on a maiden's truth;
But the maiden will break her vows with ease,
For a wooer cometh, whose claims are these;
A hollow heart and an empty head,
A face well tinged with the brandy red,
A soul well trained in villainy's school—
And Cash—sweet Cash—he knoweth the rule:
Dimes and dollars! dollars and dimes!
An empty pocket's the worst of crimes!

I know a bold and honest man
Who strives to live on the Christian plan,
But poor he is, and poor will be,
A scorned and hated wretch is he—
At home he meeteth a starving wife,
Abroad he leadeth a leper's life—
They struggle against a fearful odds,
Who will not bow to the people's gods!
Dimes and dollars! dollars and dimes!
An empty pocket's the worst of crimes!

So get ye wealth, no matter how!
"No questions asked" of the rich, I trow!
Steal by night, and steal by day,
(Doing it all in a legal way.)
Join the church, and never forsake her,
Learn to cant and insult your Maker;
Be hypocrite, liar, knave, and fool;
But don't be poor!—remember the rule:
Dimes and dollars! dollars and dimes!
An empty pocket's the worst of crimes!

At home and in the every day business life, children see their parents resort to deceit and trickery, and they are stimulated and even urged to be smart and to make money or to win the prize no matter how, but to win at all hazards. The young man is told by his parents that it is all right to get money, and that no man can be blamed for making money and pushing ahead. Such experiences in childhood and youth sow seeds of moral evil in the heart, which are sure to germinate in after years, and to grow and "bring forth fruit after their kind."

It is foolish to expect children to learn good of parents in this day and generation, therefore we must look to the Schools to teach a boy that wherever he stands, the chief thing is that he see to it that he stands there fairly and squarely, honestly and honorably and that it would be more advantageous to miss winning a prize at all than to win it by the least degree of trickery or fraud! In truth the overwhelming importance of building up a fortress of moral principle in the pupil's heart should never be lost sight of at School in the education of children and youths. A man who should have been thus trained in childhood, in youth and early manhood, would go forth in the great practical school of the world so fortified by moral principle that he would be able to resist all the temptations of avarice and to go on surely, if slowly, in a career of solid and honorable success.

What can one expect of good from the Press? the public have become to a certain degree careful about crediting what they read in the press of the West and South West as well as in a great many sections of the East where it is considered *au fait* to become a monumental liar in newspaper writing and especially in giving nasty, filthy details which they will tell you suits the public taste and sells their papers, but which should never be published at all (are not allowed to be published in decent countries where public opinion is against such), or when there is money in it for writing up something exaggerated and false, to advertise or boom some one who will pay the editor well for his space, and if one criticises or casts reflections on anything, he construes the same as malevolent attacks against the spirit and the majesty of the great American people, and then all he can do is to make untruthful and angry comparisons, just as the politicians do to hoodwink the people. It is neither seemly nor safe to hint that things are not what they should be and to point out reforms or to state that the government of this great nation is a despotism of the politician, by the politician, for the politician, tempered with occasional uprisings on the part of decent folk.

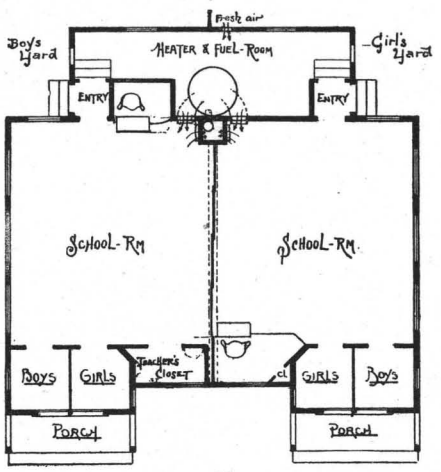
The sooner there is brought about a revolution in regard to the Press of this country the better for the whole people, and it can only be done through respectable citizens being in the majority and sending forth indignant protests that cannot be mistaken in their sound, coupled with a refusal to buy and read the trash, nastiness and lies that are printed and make up these destroyers of the maidenhood and the youth of the land.

Do not be deceived, for if the whole of England is owned by 30 individuals, as the principal of a large New York City Suburban School receiving a salary of $1,800 a year, once told the youth in his charge, when impressing upon them the grandeur of American institutions, this would not prevent the present system of educating the children, in the Schools of America and the whole fabric of American life from being rotten to the core and worthy of every effort at improvement. The more one studies it, the worse it appears. Take hold of it in a proper spirit without shiftless and reckless waiting for the time when it will come right without effort, as that time will never arrive and it will require prompt action and the onslaught must be vigorous to stem the tide.

It is hoped by the authors that only teachers will be allowed to teach who have right character and are proper for the work and each fitted by their disposition and tastes and who are in every way properly prepared to labor with children in forming correct impressions in their moral natures and in the doing that which is strictly proper and honest at all times and in all places. For after all has been said and done that can possibly be said and done for other influences, the wellfare of the children throughout this land is in the hands of the teachers. The future weal or woe of the nation depends in great measure upon this devoted band of home missionaries, who should be none other than thoroughly qualified Christian gentlemen and ladies, the same as are employed in this work in other countries where they are not a quarter as well paid as here.

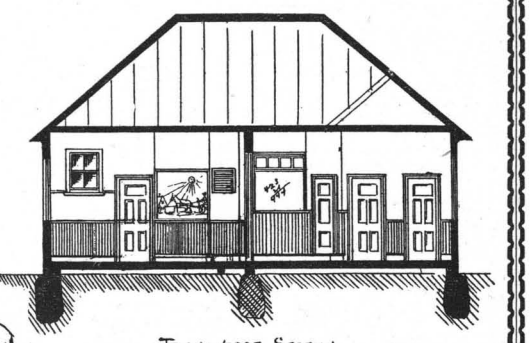
There are in many rural districts too many teachers who cannot read or write decently, much less spell the ordinary words, and know very little of anything of life, being two young and ignorant; but they have assurance and pull, and draw salaries ranging from $25 to $75 a month.

But how can we have the right kind of teachers? This is where the agitation must begin. Teachers of this kind are found in other countries, then why not here? The masses of our people are as ignorant as can be, and it does not seem as if the majority of them would ever be alive to the importance of these matters. Town Committees, Trustees, Boards of Education, Farmers' Institutes and people generally should take up this subject, investigate and agitate.

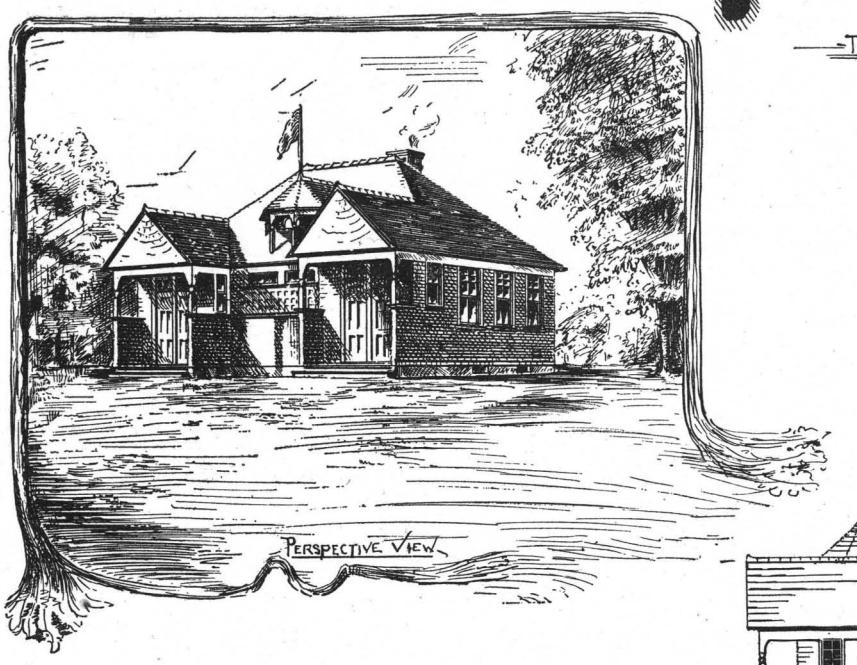


FLOOR PLAN

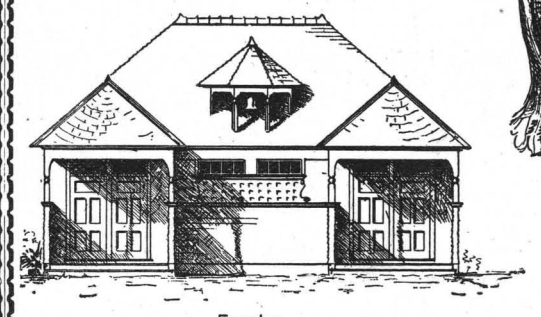
DESIGN
For $1000 School House—Class 2
BY
Palliser, Palliser & Co.
24 E. 42 St. New York



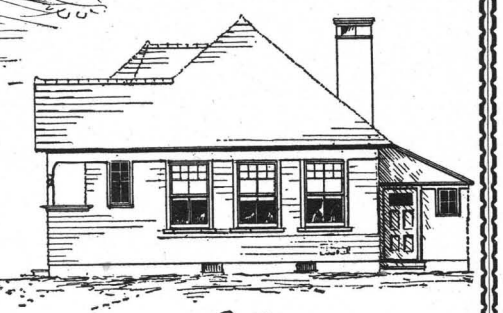
TRANSVERSE SECTION



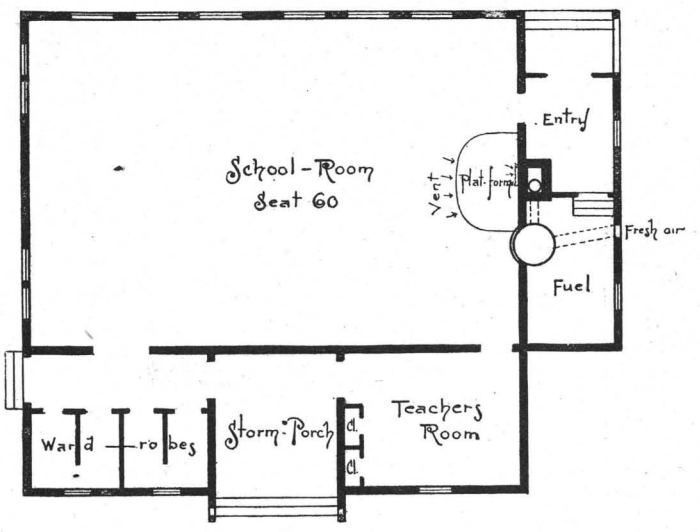
PERSPECTIVE VIEW

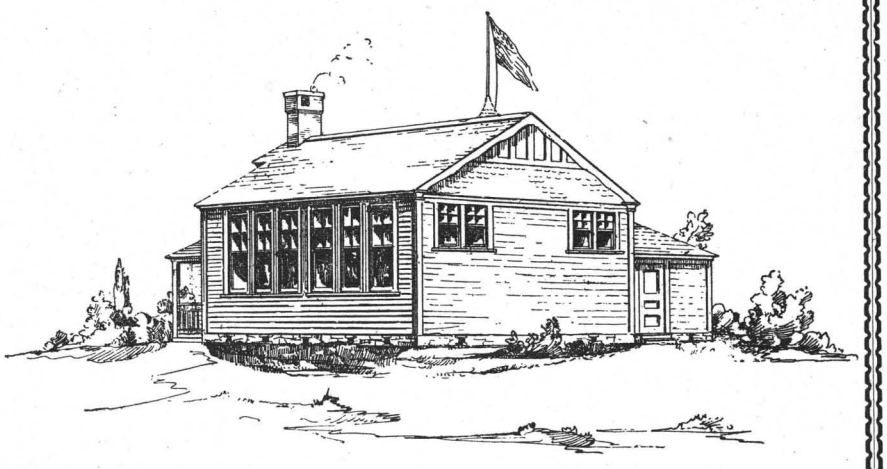


FRONT

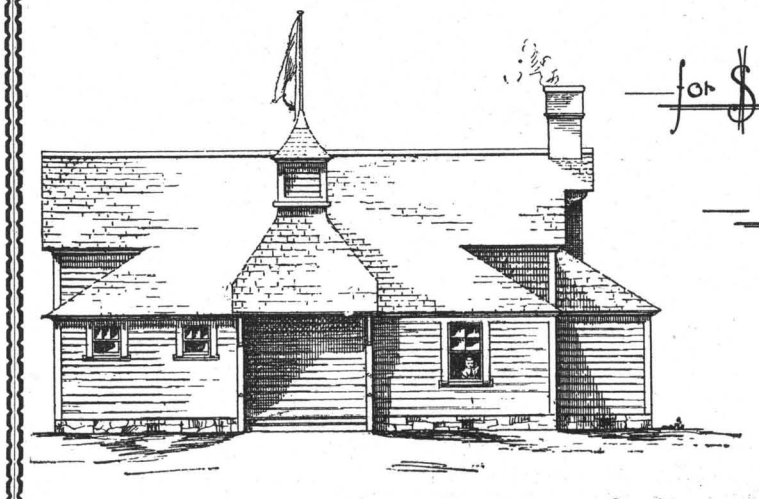


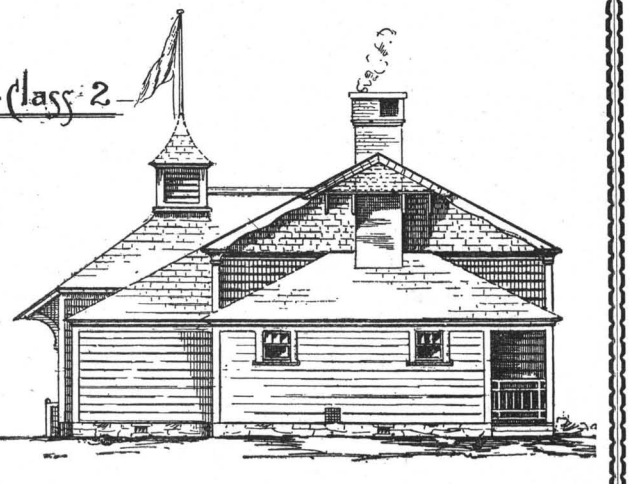
SIDE





Design
for $1,000 School-House—Class 2
By
Palliser, Palliser & Co.
24 E-42nd St.
New York





On the Selection of School Sites.

Modern sanitary science has given such particular attention to the subjects of site and exposure, and has impressed the public mind so thoroughly with the necessity of their healthfulness, that only willful ignorance or pecuniary considerations will in these days permit a building designed for human occupancy to be placed in a manifestly unhealthy location. The healthfulness of a school site, however, depends very much upon the character of the soil, elevation, drainage, remoteness from stagnant water or marshy ground, and from unwholesome trades and industries. While no school authorities would err so far as to place a schoolhouse in a situation decidedly unfavorable in regard to any of these considerations, there exists between this and a decidedly healthy location all manner of intermediate situations, which call for exercise of good judgment and a knowledge of sanitary science in deciding upon their fitness as sites for a school.

In the larger cities, where the choice is somewhat restricted, the site being frequently "made ground" formed by bringing earth from a distance, consisting often of the refuse and garbage collected from cellars and ash barrels, and deposited over spots originally low and swampy, there is often a great destruction of health. The gradual putrefaction of such organic matters, the slow oozing up through the soil of poisonous gases, leads to the production of effluvia, which mount into the schoolrooms, and may develop diphtheria, fever and ague, and other diseases.

In connection with all these conditions children are much more prone to suffer than adults; their resisting powers are smaller, and they sooner fall victims to the results of bad hygienic conditions. The choice of location, therefore, should always be such as to avoid these influences so hostile to health.

Frequently no choice can be made as to the school site. It already exists, and must be adapted as best it can for its purpose. Or, again, the site is determined by arbitrary and inevitable circumstances, such as the question of expense of ground, central position for the children, etc.

In all cases where a choice is possible, the following requirements should be carefully fulfilled; and where an unsuitable site already exists, it should either be abandoned or brought to a right condition before building is commenced, or if already in use, its defects should be remedied, no matter what the cost.

First.—The Level of the Ground or Subsoil Water must be carefully ascertained. Every soil contains water at a certain level below its surface, the depth of which can be easily ascertained by finding the height of the water in the nearest shallow well. The basement floor should be at least four feet above the highest level of the ground water. A soil in which the ground water is usually low, but liable to sudden variations in level, is less healthful than one in which the water is somewhat near the surface, but without great alternations. The close relationship of consumption to excessive moisture of the soil has been clearly demonstrated in England by Dr. Buchanan, and in America by Dr. Bowditch, of Boston, Mass.

Rheumatism, likewise, is favored by damp and ill-drained sites. When a damp soil contains decomposing vegetable matters under the influence of the warmth of late Summer and Autumn months, malarious diseases are liable to be produced.

Ague, the type of malarious diseases, was formerly prevalent in Southern New England, around New York City and many parts of New Jersey. Improved drainage and the consequent increased dryness of soil, have, however, almost entirely abolished it. Diphtheria, again, seems to be connected in its origin with a damp soil, though, in this case, a defective condition of sewerage is generally associated with the dampness.

In connection with these conditions children are sure to suffer; in fact such bad hygienic conditions simply means disease and death for the children.

Second.—Drainage of Soil.—No matter how dry may be the natural condition of a soil, a site without means of drainage should not be accepted on any terms. Even a clay or springy soil may be made comparatively warm and dry by means of brick or perforated earthenware drains. These should preferably not run into any part of the sewerage system, but into the nearest watercourse. If it is necessary to connect them to a sewer, their contents should not pass directly into it, but into a disconnecting trap. The subject of drains is so vast and important, that but little more than an allusion can be made to it here. A good system of drainage is one of the greatest scientific advances of modern times; a poor one worse than none.

Third.—Character of the Soil.—"Made" soils, for the reasons already given in this article, should be avoided. Sandy or coarse gravel soils are the best, and much more so than hard loam or rocky formations. Clay soils are cold and retentive of moisture, unless very well drained.

Fourth.—Relation of Site to Objects, etc., in the Immediate Vicinity. — The schoolhouse should be located in a high, dry, open lot on a hill, so that the ground slopes rapidly away from it on all sides, and if the locality is flat, the basement should be set well up without much excavation, and then graded up all around the outside of the walls, so that to a certain extent the hill will be made where the building is placed.

The neighborhood of stagnant pools or marshy ground is to be studiously avoided, as it is open to the dangers which are necessarily associated with the slow putrefaction of organic matters. The vicinity of any factory or other establishment liable to poison the air with offensive effluvia should likewise be avoided.

India-rubber works, tanneries, bone-boiling and soap-making establishments are particularly objectionable. The neighborhood of manufactories or workshops that employ noisy machinery is very bad for school work.

A site in a main street or thoroughfare is by no means always advisable, as the noises and dangers are more prominent than in a retired side street. Proximity to a foundry, a railway track or station or horse-car stable is not desirable. Trees should not be allowed too near so as to impede the free circulation of air and entrance of light. The close vicinity of higher buildings is for similar reasons an objection.

The site should be sufficiently entensive to allow for playgrounds. This is not only necessary for recreative purposes, but it prevents to some extent the overshadowing of surrounding buildings. At least two adjoining sides of the school should be freely exposed to light and air, and at a distance of not less than 50 feet from other property.

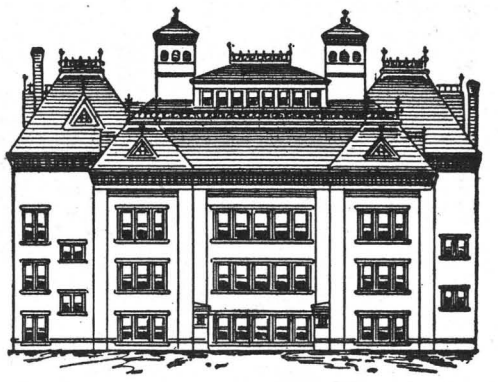
Of course such a site for a schoolhouse should be selected as will make good ventilation possible. Air which has been charged with emanations from ground filled in with garbage, from miasmatic marshes, stagnant frog-ponds, the refuse of slaughter-houses, the sour water of starch factories, or sludge acid of oil refineries, is not fit for breathing. It is worth while to mention this. In the selection of sites an oversight or ignorant disregard of such sources of bad air is by no means unprecedented. It must be remembered that the architect has done all he can with a building on any particular site when, on the assumption that the surrounding air is good, he has designed an apparatus that will introduce sufficient air, and so circulate and discharge it as to remove the impurities generated within the building. He is not responsible for imperfections of site, except when its selection was guided by his advice. However, although carelessness and ignorance in the selection of sites is far too common, we think that we have sufficiently emphasized the importance of exercising the greatest care in so doing.

Character in the Outer Structure of the Schoolhouse.

The architectural design of the outer structure should conform to the hygienic and economic needs of the school. It should be characteristic and able to tell its own story plainly, even when one is at a distance of half a mile, so that it could be distinguished from a church, a city hall, a court-house, a factory, or a brewery. It should never be over three stories high above the basement, and, in fact, it is better that schoolrooms should not be placed higher than the second story. The general make-up should be simple, dignified and architectural; picturesqueness may be allowed some play in the design of a rural schoolhouse, but in a larger building it should never be attempted, as failure will surely result; the lines should be symmetrical, the cornice and roof should be dignified, and there should be no waste of material and labor.

The proper method to adopt in designing a school building is to make a careful study of the requirements of the problem, and then draw the floor plans to meet the same, and let the elevations rise naturally from the plan solution. The simplest elevations, provided they are architectural, will be the most satisfactory, provided that every need in its sanitary arrangement without waste has been fulfilled, for then the building will be characteristic, and all its features will be commendable to the most highly cultivated taste.

For hygienic construction of schoolhouse foundations, walls and, in fact, all the details throughout, we ask our readers to carefully study the illustrations and specifications given in this work, and we also refer the reader to pages 106, 107 and 110 of this work for a number of illustrations of existing buildings that are anything but good examples of architectural design.



The schoolhouse of which an elevation is here given, is situated on a hill, and can be seen in some directions at a distance of half a mile, but it has the appearance of a brewery, and is never made out as being the high-school building. Over 100,000 bricks were wasted in carrying up the walls unnecessarily high, constructing ugly, heavy projecting cornices all around the building, and towers that are not wanted either for style or space, and which are certainly very unarchitectural in appearance, whereas, if the designing had been in proper hands, it could have been made a dignified and architectural whole, satisfactory to every need.

This building is constructed throughout of common hard bricks, exterior facing of walls selected, and it contains above the basement ten ordinary schoolrooms and an assembly room, and cost the city it was built for some $60,000.

Miscellaneous Suggestions.

As dampness is so very dangerous to health and is the cause of several forms of disease, care should be taken that the schoolhouse be placed upon a dry soil, and not within a heavy tree growth. Its basement and walls should be made impervious to dampness, and this matter is of the greatest importance, for often it proves to be the source from which disease suddenly breaks forth.

Schoolrooms should never be placed in the basement, no matter if the top of the floor is only 2 or 3 feet below the ground level, no matter what the architect says, and don't believe a single word written by that impracticable architect in describing the hygienic construction of his model high school building, who endeavors to excuse himself for placing four schoolrooms in the basement. He says: By careful preparation of the foundation walls, etc., the rooms in the basement will be as dry and healthy as any in the building. Yes, it requires very careful preparation and costly work to do this, much more so than he knows or has the ability to give, besides he put these rooms in the basement in order to get the building within the appropriation, although he could have done it without resorting to so dangerous an expedient had he been practical and known enough to save where he wasted, viz., at the top of the building.

At the convention of the International Association of Factory Inspectors of North America, a recommendation was made for the passage of laws compelling the erection of schoolhouses upon scientific hygienic principles, and prohibiting the erection of any school building more than two stories in height.

In each classroom, 15 square feet of floor space and 200 cubic feet of air space should be allotted to each pupil. In each classroom the window space should be not less than one-fourth the floor space, and the distance of the pupils' desk most remote from the window, should be from one and a half times to twice the height of the top of the window from the floor, and as much less as possible. The height of the classroom should never exceed 14 feet.

Probably the class of educational institutions that have the worst buildings and sanitary arrangements are the so-called seminaries, institutes, boarding and private schools that are scattered all over the land, and that are so vigorously advertised in all the magazines, and each of which is grandly pictured in a descriptive way in a circular with terms, etc., issued by the controlling genius, who may or may not be an educator, but who manages to make money out of the same.

Usually they are kept in old ramshackle country dwellings, most wretched in their plumbing and drainage, without any attention to ventilation, miserably lighted and warmed, and in the way of home comforts entirely foreign. Yet parents keep sending their delicate daughters to such institutions because it is fashionable to say our —— is away from home at boarding-school studying music, etc.

"You bring up your girls," says Ruskin, "as if they were meant for sideboard ornaments, and then complain of their frivolity. Give them not only noble teaching, but noble teachers, and give them the help which alone has sometimes done more than all other influences—the help of wild and fair nature. You cannot baptize them rightly in inch-deep Church fonts, unless you baptize them also in the sweet waters which the great Lawgiver strikes forth from the rocks of your native land."

We give here an approximate table of cost of erecting and completing school buildings which will be found reliable and enable anyone to make an estimate quickly.

Small frame buildings cost $12 to $15 per pupil.
Large " " " $20 to $25 " "

Brick buildings without basement or warming apparatus, cost $30 per pupil.

Brick buildings, warmed, ventilated and best sanitary construction, cost $35 to $50 per pupil.

Brick buildings with fire-proof stairs, warmed with steam indirect, thoroughly ventilated and all sanitary arrangements, cost $60 per pupil.

Brick buildings with complete fire-proof construction and thorough protected work throughout, cost $75 per pupil.

A schoolroom 22 or 23 feet wide by 32 feet long, seats 48 single desks or 60 double, but often is crowded to 54 single and 66 double.

A schoolroom 26 by 35 will seat 64 at single desks and give liberal space.

Admiral Lord Nelson, when serving his country in American waters as Captain Nelson, was familiar with the social and business life of the people, and in speaking of the same in a communication, he says "Money making is the great object here. Nothing else is attended to." And to a man like Nelson such a state of affairs was simply disgusting.

The bane of the social, intellectual and spiritual life of America to-day, is the idolatrous homage of the golden calf. In home and business, in politics and the church, it obscures nobler ideals and debases higher sentiments, yet we would that every boy should carry with him this thought that it is much better to serve an ungrateful country than for one to give up his own fame. Posterity will do him justice. A uniform course of honor and integrity seldom fails of bringing a man to the goal of fame at last.

In the English schools George Washington is held out constantly before every English schoolboy as a model, and when the writer was a boy and attended school in England, the story of Washington, of the little hatchet and the cherry tree, was gone over and read day by day.

The programme of the school should be to teach every American boy to follow a simple life devoted to earnest work, coupled with joyous recreation. Let the national flag float over every schoolhouse in America, and the exercises be such as shall impress upon our youth the patriotic duties of American citizenship.

The Presidency of this Republic is within the reach of every American-born boy of sterling character, but at the same time it is well to note here, that there are two kinds of Americans, the one styled smart—the trickster—and the other either possessed of very large wealth or having it at his back, that have never been elected to this high office, and probably never can be so long as it continues to be a Republic.

The schoolhouse should point the way and be the leader in all new communities in that which pertains to the art of building, and away out on the frontier, where rough materials are only at hand, it is right that a proper regard be given to the design and construction, so that the same will present both taste and convenience, and insure to teacher and scholar all the conditions of health. The roughest materials can readily be adapted to artistic forms by thought and the cultivated taste of the architect, and convenience in such buildings does not consist of elaboration or intricate planning, but is rather the result of experience and careful study of the subject, and knowing just what to do, and in doing it in just the right way, and the most simple precautions and methods in sanitary matters are far superior to costly devices that people are continually striving for and seem to think are necessary adjuncts of the present civilization.

Wherever small schoolhouses are built with the basement omitted, great care should be exercised in preparing the ground under the building; the sod, black earth, stumps, and all vegetable and decaying matter should be effectually removed, and after this has been done, then the space between the walls should be filled up with stone, sand and gravel or cinders to a height considerably higher than the ground is outside of the walls, making it about two steps up from the walk or grade to floor; this gravel or cinders should be settled thoroughly, and then covered with two inches thickness of concrete or asphalt, on which, after it is dry, are laid small sleepers of a dovetail shape, sixteen inches between centers, the spaces between the sleepers being leveled up with concrete, and after all is dry then narrow hard-wood matched flooring should be well laid and nailed to the sleepers or ground-joist, thus giving the most solid and healthful floor in such a described building, and will be found the most active preventive of sore throats, diphtheria and pneumonia.

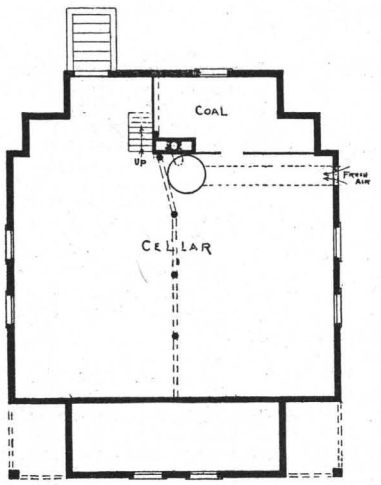
It is a serious fault to use joist and an air space under the building, instead of the above, unless the ground is also carefully prepared and the space well ventilated, besides in Winter it produces a cold floor, and is more expensive than above, and is very much inferior. It is not such a serious matter, if economy requires it, to place a building on posts or piers, provided the spaces between them are closed up carefully, floor constructed so as to shut out cold and damp, and the ground underneath properly prepared and graded high up in the centre, to prevent water, etc., from running or rising out of the ground under the building.

As an extra precaution in cases where there is no ground to be had for the purpose except that having chronic dampness, place a blind ditch around the building, one foot below foundations, with a steady descent to a place for an outlet left open to the air. After the trench is prepared and stoned up and covered over with stone, lay over top of same a layer of fine brush or dried coarse grasses before filling in the earth.

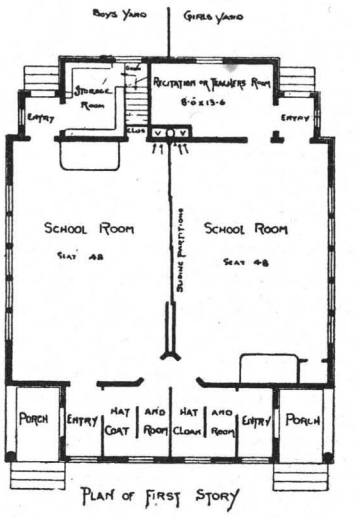
"It has been proved over and over again," says Dr. Parkes, "that nothing is so costly in all ways as disease, and that nothing is so remunerative as the outlay which augments health, and in doing so, augments the amount and value of the work done."

Playfair, whose statistics are regarded as of great value, tells us that there are twenty-eight cases of sickness to every death. Let us reduce the estimate to a minimum of twenty. At a low calculation each case of sickness represents a loss of fifty dollars to the State, or to the community taken as a whole. Every unnecessary death, and the twenty concurrent cases of unnecessary sickness, therefore, represent a public loss of one thousand dollars. In other words, the community is on that account so much the poorer. Dr. W. E. Boardman, in a careful and elaborate paper contributed to the "Sixth Annual Report of the Massachusetts State Board of Health," demonstrates that the annual loss to that commonwealth by preventable sickness is considerably more than three millions of dollars. The loss to the people of the United States thereby is not less than the interest on the national debt. Every dollar wisely spent for the preservation of the public health is returned tenfold, sometimes a hundredfold to the community. "It is," says Dr. Farr, "as certain that a high mortality can be reduced by hygienic appliances, down to a certain limit, as it is that human life can be sacrificed." And above all material saving is the far higher consideration, the divine economy of human suffering. "The hope," again says Dr. Farr, "of saving any number of human lives by hygienic appliances is enough to fire the ambition of every good man who believes in human progress."

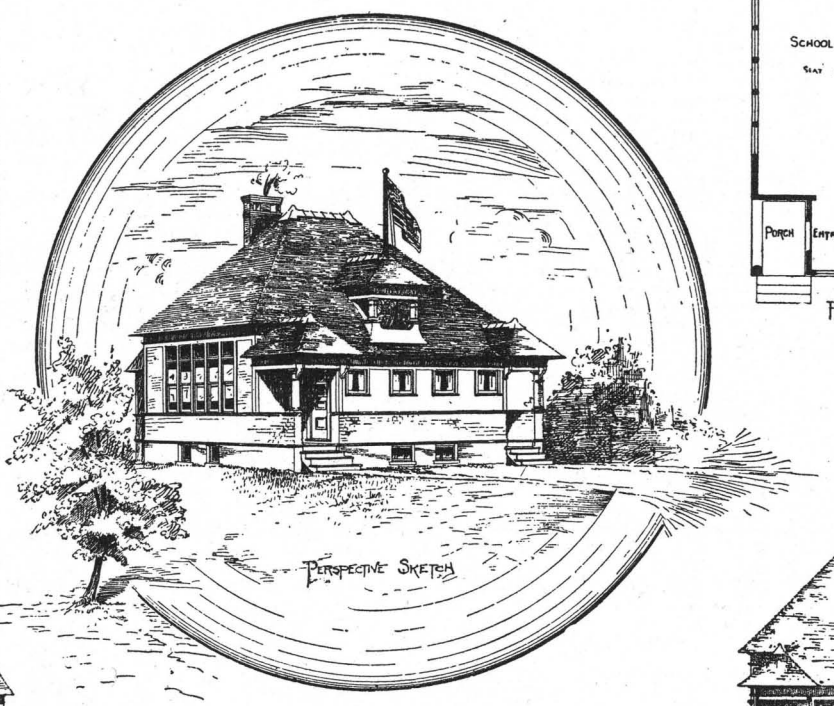
DESIGN
FOR $1500 SCHOOL HOUSE-Class 3
BY
Palliser, Palliser & Co.
24 E. 42 St
New York



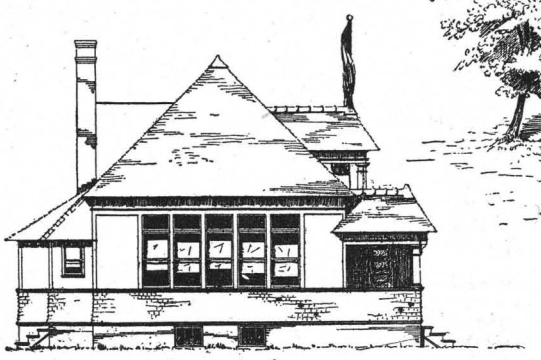
PLAN OF CELLAR.



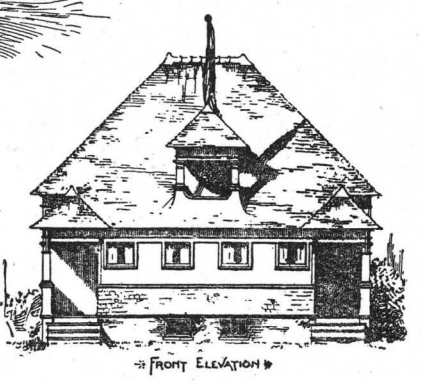
PLAN OF FIRST STORY



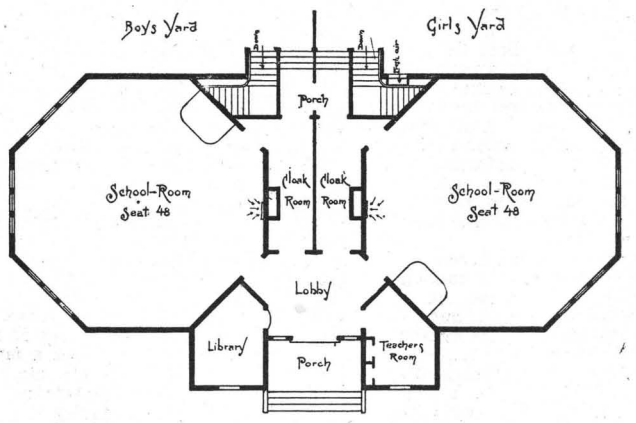
PERSPECTIVE SKETCH



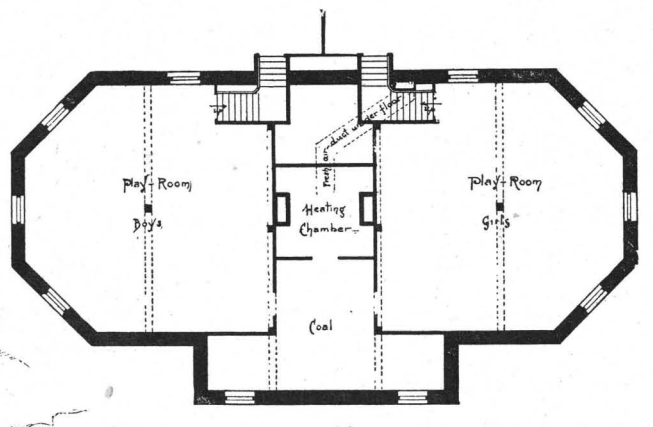
SIDE ELEVATION



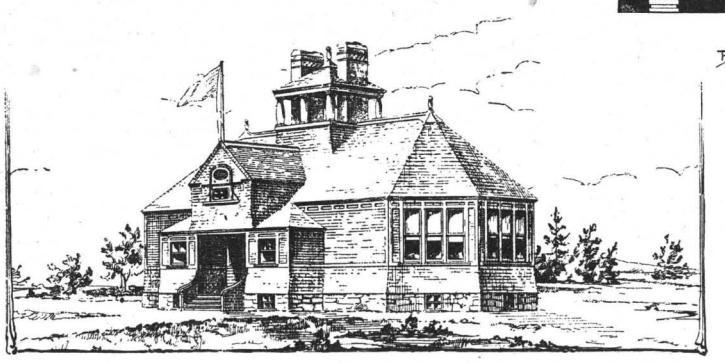
FRONT ELEVATION



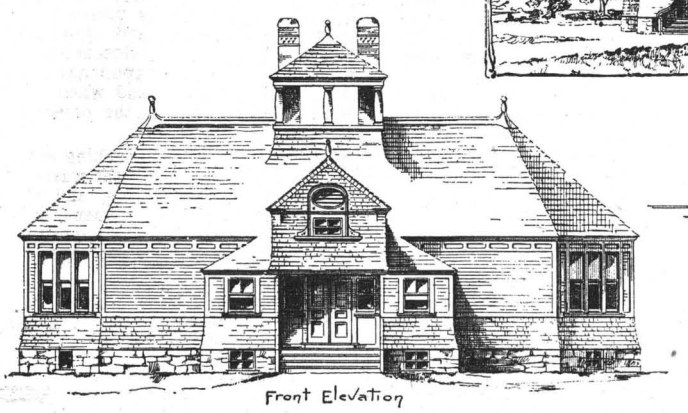
First Floor



Basement



Design
for $1,500 School-House—Class 3
By
Palliser, Palliser & Co
Architects
24 E. 42nd St
New York-city



Front Elevation

Side Elevation

SCHOOLHOUSE SANITATION.

We print below an extract from a paper read by Prof. F. S. Dewey at the sanitary Convention held at Alpena, Mich.:

The subjects of heating and ventilation are so closely connected that it is almost impossible to have the one without the other, on account of their interdependence; so does a discussion of the one involve a discussion of the other. If we would have a good, even, thorough distribution of heat throughout a building, then must we have some ventilation; and to ventilate a building thoroughly in all its parts without the employment of heat would necessitate a mechanical process altogether too expensive for general use.

I believe we may safely lay down this proposition: That he who seeks the successful warming of a building will find his success in the direction of ventilation, and he who seeks the key to the successful ventilation of a building will find it in the fire.

In the warming of a building there are two things to do: 1st, to bring it up to the proper temperature; 2d, to provide against a constant loss, such as radiation through the walls, through floors, ceiling, roof and windows.

CHARACTER OF WALLS.

Many people suppose that thick, solid walls of masonry will "keep the frost out;" in other words, that they will keep the heat in. This may or may not be sound logic, but it usually is not. It cannot be depended on. A house built of iron, though it might be as tight as a boiler, would scarcely be warmer than a bird cage, while one built of porous paper fairly backed by wood may be much warmer than one of solid stone. Many aim to make the walls absolutely air tight, and for this purpose use a very thin, light compact paper, on the false supposition that heat can only escape as air escapes. This is a very prevalent fallacy. Heat can crawl through cast iron, can dodge through brass, with ten times greater facility than it can through cheap tar felt. The successful imprisonment of heat depends, therefore, not so much on air-tight walls as it does on non-conducting walls; not so much on their solidity as on their porosity.

A wooden building with walls well lined or covered with thick paper will require less heat to keep it warm than one of solid brick, while a building whose walls are brick will generally require no more than two-thirds as much fuel as one whose walls are of the same thickness and made of stone. And if the walls are not plastered, then, the walls being of equal thickness, the stone building will demand almost twice the fuel required for that of brick.

GLASS SURFACES.

Another great source of radiation is the windows. The making of them air tight helps but little. During low temperature a cold current is always felt in their vicinity. This is neither cold air coming in nor a draft passing out, but the air of the room, robbed of its heat, dropping like water on the window sill. The best means for providing against this rapid loss of heat is the double window, or, rather, an extra outside or inside window to put on during cold weather. Not far from one-half the loss of heat in a building is through the windows, and more than 25 per cent. saving of fuel in a cold climate is certainly an item worth considering.

In the successful heating of a building a very important item lies in having ample size for the heater, just as the successful ventilation of a building depends upon the large size of its pipes. The small size of the furnace, the small pipes for feeding cold and drawing off warm air and the inadequate means of escape for the air of the rooms furnish very fruitful sources of failure.

The size of the heater need not always be in the ratio of the size of the building. Much depends on the exposure, on the material of the walls, of the roof, on the windows, and very much on the ventilation. Any one who expects to get good ventilation without paying for it in fuel might as well expect to get good preaching without paying for it in money. There may be wasteful extravagance, however, in the one case as well as in the other.

STOVES.

As the common stove affords the least amount of ventilation and the largest percentage of heat, it is popular for warming; but as it requires no air except the little for combustion of fuel, it is a poor dependency for ventilation. The open grate or fire place, with its curling flame, its ruddy glow, its invigorating beams, is a most delightful source of heat, but it is wastefully extravagant in fuel. Indeed, more than 85 per cent. of the heat generated in the open grate is wasted and sent off up chimney, doing no good whatever, except by way of ventilation. It is, however, an admirable auxiliary, with a furnace for furnishing excellent ventilation, and its cheering glow serves to attract about it the historical family circle.

The ordinary warm-air furnace, which is simply an encased stove, usually placed in the basement, must, for many reasons, remain a favorite generator of heat. Whenever this fails it is almost universally attributable to the setting and the piping. Large size of the fire-box, ample radiating surface, abundant flow of air, direct and sufficient smoke flue and a sure means of escape for the air of each room to be heated—these are all absolute essentials to success. The inlet pipe should be nearly as large in its smallest part as the combined area of all the hot-air pipes leading from the hot-air chamber. The combustion should be regulated, not by a damper in the smoke flue, but by the opening or closing of the aperture for the admission of air to the fire. If the heating surface is as large as it should be, and a proper flow of air through the furnace is maintained, the fire-box need never be made red hot.

The closing of registers shuts the heat in the furnace and often allows it to become dangerously overheated. The shutting, then, of either the inlet pipe or the hot-air register is a very ready means for the destruction of the furnaces.

STEAM AND HOT WATER.

Steam and hot water are favorite means of conveying heat long distances and for distributing it in many rooms; but if the direct radiators are used they are very objectionable, as they provide no means of ventilation. The indirect method, where it can be advantageously used, is much to be preferred, and is substantially the same as the warm-air furnace. It possesses this advantage, however, that it may be located just under or in close proximity to each room and furnish over its coils an abundant flow of fresh air.

FRESH AIR.

By a wise provision of Providence, that which is most essential to the existence and well-being of man is most abundant. Fresh air, always needed, is everywhere, unless man has made provisions for shutting it out. The exhalations from the lungs, the various emanations from the body, are poisons which do far more damage to mankind, and are the source of more diseases than are all the other poisons in the world. To dispose of these products of animal combustion, this constant waste material, on the one hand, and to bring in fresh air suitable for comfort and health on the other, this is the province of ventilation. From 10 to 15 cubic feet of air are inhaled by each person per hour. More than ½ cubic foot of exhalation per hour is the foul carbonic acid. This vitiates or poisons hundreds of cubic feet more. The air from the lungs contains more than 100 times as much poisonous gas as does the air in its normal condition, and it also contains foul vapor emanations, of from one to three ounces per hour. To breathe these over and over again is to court disease and death. It is my belief that 40 per cent. of all fatal diseases are due to impure air. There is one defect in our public schools to-day that is comparable in gravity to that of foul air. Children are sent to school, and soon the bloom deserts their rosy cheeks; they grow pale and sickly, and their parents charge it to hard study, to overwork. I believe that very few pupils die or even suffer from overwork in schools. It is lack of invigorating, life-sustaining oxygen. There can be no thought without life, no life without oxygen, and no sufficient supply of oxygen without ventilation.

A thorough system of ventilation and heating should answer many demands.

a. It should furnish ample heat.

b. It should distribute the same evenly throughout the building to be heated.

c. It should introduce a sufficient quantity of fresh air in proportion to the actual needs of the inmates.

d. It should thoroughly warm and sufficiently moisten the same before it enters the room.

e. It should draw the foul air from the floor.

f. It should have no connection whatever with any closet, vault, cesspool, urinal or any other source of deadly gases or foul and fatal emanations.

DRY CLOSETS.

Much has been said at these conventions heretofore concerning a system of ventilation which has connected with it and located in the basement an arrangement which its managers have been pleased to denominate a "dry closet."

In this so-called dry closet, as found in the Third Ward School in this city, there is a large open passageway leading from an ordinary privy vault up into every room in the building. Neither the teacher nor the janitor has any power whatever to close it. If a good fire is kept the air is drawn off the floor of the rooms down over the ordure there deposited. It is laden with the moisture from the evaporating fire of the furnace if there be one, and all the breath and exhalations from all the pupils. It is far more moist than the outside atmosphere. The urinals and the floor all about them are soaking wet, and the excreta beneath the seats is in precisely the same condition as it is in any vault outdoors. After it has been there a week you can no more burn it than you can burn mud; and when on Friday night it is pushed along that low passageway into the very base of the stack, it is just as impossible to burn it on the following Monday morning. It is then taken on a shovel and carried around and put into one of the furnaces, where it often puts the fire out, and under any circumstances sends during its cremation a most sickening stench down upon the people and frequently out into the basement, precisely the same as the imaginary fire beneath the seats, which they now advertise, would ceaselessly send off.

Talking about cremating it "*in situ.*" Why, the seats are of wood, the covers are of wood, the floor is of wood, and to instruct the janitor to attempt to burn it "*in situ*" would be to instruct to burn the building. And as their scientific expert himself said, "It would be foolish to attempt it."

The advocates of this system say, "Think of the vast amount of air passing through the vaults." Well, what of it? There is not nearly so much as there would be out of doors, and it is not so dry, and a personal inspection would satisfy the most fastidious that the excreta is a long ways from possessing any resemblance whatever to "Buffalo chips." The odor arising therefrom not only must be, but is proportional in amount and the same in kind as that from any other vault. Furthermore, the water has soaked the bottom of the basement away beyond the walls of the room, and the cement floors about the furnaces themselves are thoroughly saturated therewith. Last week every room above was foul with the sickening odors from below. Unfortunately the fire goes out nearly every night, in spite of every precaution, and in the morning the rooms are filled with that same sickening stench.

Often the currents change during the session of school, and I am told that the children are sickened, sometimes half a dozen at once, by the back draft; and yet here we have, as Mr. —— told me himself, the "dry-closet" system in all its perfection. I know this is not a beautiful picture, but it is their own. They made it. The janitor has followed directions exactly, has got up and built fires in cold weather at 4.30 and 5 o'clock, to insure safety and warmth to those who were yet fast asleep in bed; has filled those rooms full of warm air from 10 to 20 times, each time a little warmer, only to send it down through those closets and off out doors again before anybody came to ventilate for. This must be done to take care of that so-called "dry closet." What economy! What a travesty on common sense! "Sixty thousand cubic feet hourly." Two hundred and forty thousand cubic feet of air warmed and wasted before there is any one there to use it, and yet he who dares raise his voice against all this is charged with "slanderous accusations and malicious intent."

Their scientific expert very naively informed us that these microbes and these germs sent up the flue and scattered broadcast over the people were diluted so as to be perfectly harmless, and when forced to the conclusion that a seed could not be diluted any more than an ox or a bush or a Canada thistle, he then gave us this consoling assurance that they were "disseminated." "Take comfort in this thought," "they are only disseminated."

We are now told that, directly under each seat, a raging fire is to be kept up "beneath and for a short distance above the platform, over 300° F."; in fact, a hot stove for the ordure to fry upon. No need of any garden of roses in that neighborhood.

When our children go from us for the first time, we are asked to put them on the top of the wide passageway that leads down to death. The most virulent, insidious poison encountered by any creature is the poison of its own excreta. Whole families of animals are checked from overrunning the earth by this means alone; and yet we are told to fill the pure, bracing atmosphere full of it. Why, even the dogs and cats know better than this and bury it, or try to. Very many of the animals whose excreta is offensive possess a higher degree of intelligence than this displays.

BAD RESULTS.

The system condemns itself from a commercial point of view, because it is enormously expensive both to get and to maintain. It condemns itself from a ventilating point of view—*a*, because nobody for whom ventilation is provided has any control over the amount of ventilation whatsoever; *b*, it furnishes ventilation exactly according to the amount of heat; *c*, the fewer the pupils, the greater the amount of heat required; the more pupils, the less heat required; hence, the more pupils, the less ventilation, and the fewer pupils, the more ventilation; *d*, during the morning hours it fills the rooms with partially warmed air from 10 to 20 times and turns it off outdoors again when no one is present to ventilate for, thus entailing a great waste of fuel.

As several rooms run into one passageway the system ventilates one room at the expense of the other. Yesterday forenoon, with a fire two or three hours in the stack, two of the rooms were receiving a strong current of air up from the vault, while the other two were sending a like current down.

The so-called dry closet condemns itself because it is no dry closet in any sense of the word—nothing but a common privy-vault—having no hot air, no warm air, no dry air, no provision for burning the excreta, no valve for shutting off the back draft into the rooms, because it fills the rooms with a sickening, poisonous odor, because a fire must be always maintained, the windows must never be opened, and especially on warm summer days, and the whole closet system is a steaming wet mass of filth and nastiness, too disgusting to be tolerated under a schoolhouse for a single day.

We have been naively asked, how they succeed in putting this thing into so many schoolhouses? Why, the same degree of enterprise which was shown here would almost force the thing into paradise itself. A preconcerted meeting in the Saginaw Valley, a contract for the dear "dry closet," before the plans were drawn, even before any plans were advertised for; this is the kind of systematic enterprise that ought to bear some fruit. The long newspaper advertisements, the flooding of the city with beautiful pictures and glowing descriptions, which to be sure are against the first judgment of nearly all our very best scientists, and the common sense of us all, this kind of enterprise among a people so ready to be humbugged with what they do not understand and have no time to investigate, all these things do not run to vines. If any see in this a fancy sketch, let him investigate for himself. Let him go, as I have done repeatedly, and examine it. Make careful inquiry of those who know, and there can be but one conclusion.

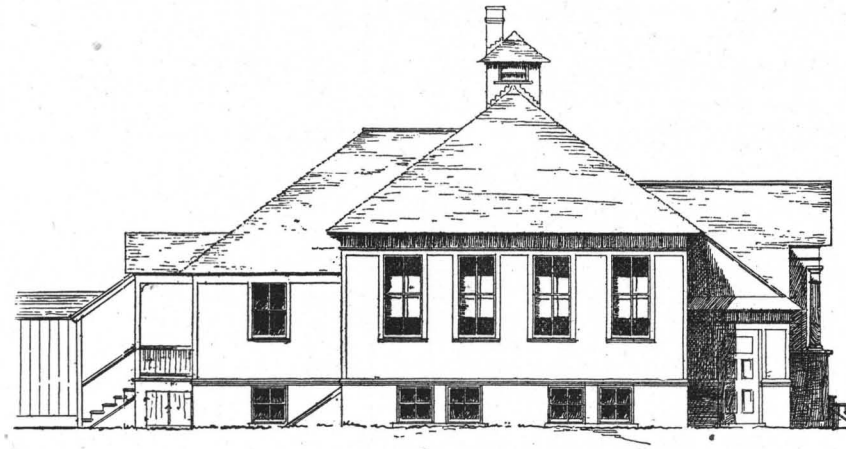
In our observations we have not noticed any marked objections to the modern sanitary dry closets placed in the basements of many schoolhouses erected in towns and villages, where a system of sewers has not been inaugurated to allow of wash-out school closets or water closets of any kind to be provided and connected with same. We would, however, be pleased to hear from school teachers and officials who have to deal with the dry closets herein referred to, as to their experience from a sanitary point of view, and when writing please give the name of the patent sanitaries you have in use.

At the present time a leaching cesspool or privy vault to receive the wastes of a schoolhouse is inexcusable, and should not be tolerated for a moment, as such methods are in outrageous opposition to sanitary science and common sense.

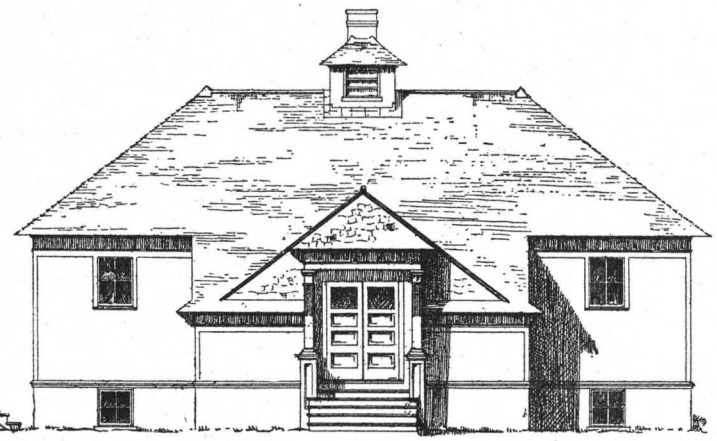
Respectfully,

PALLISER, PALLISER & CO.,

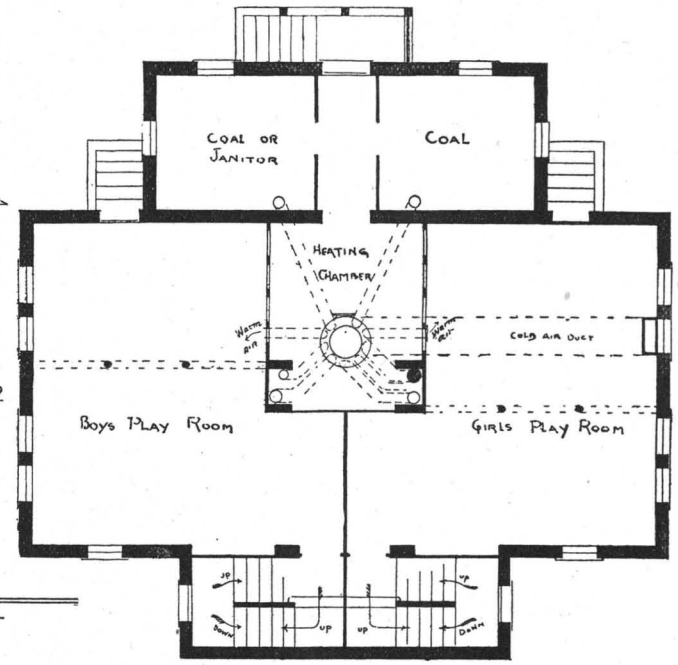
ARCHITECTS.



Side Elevation



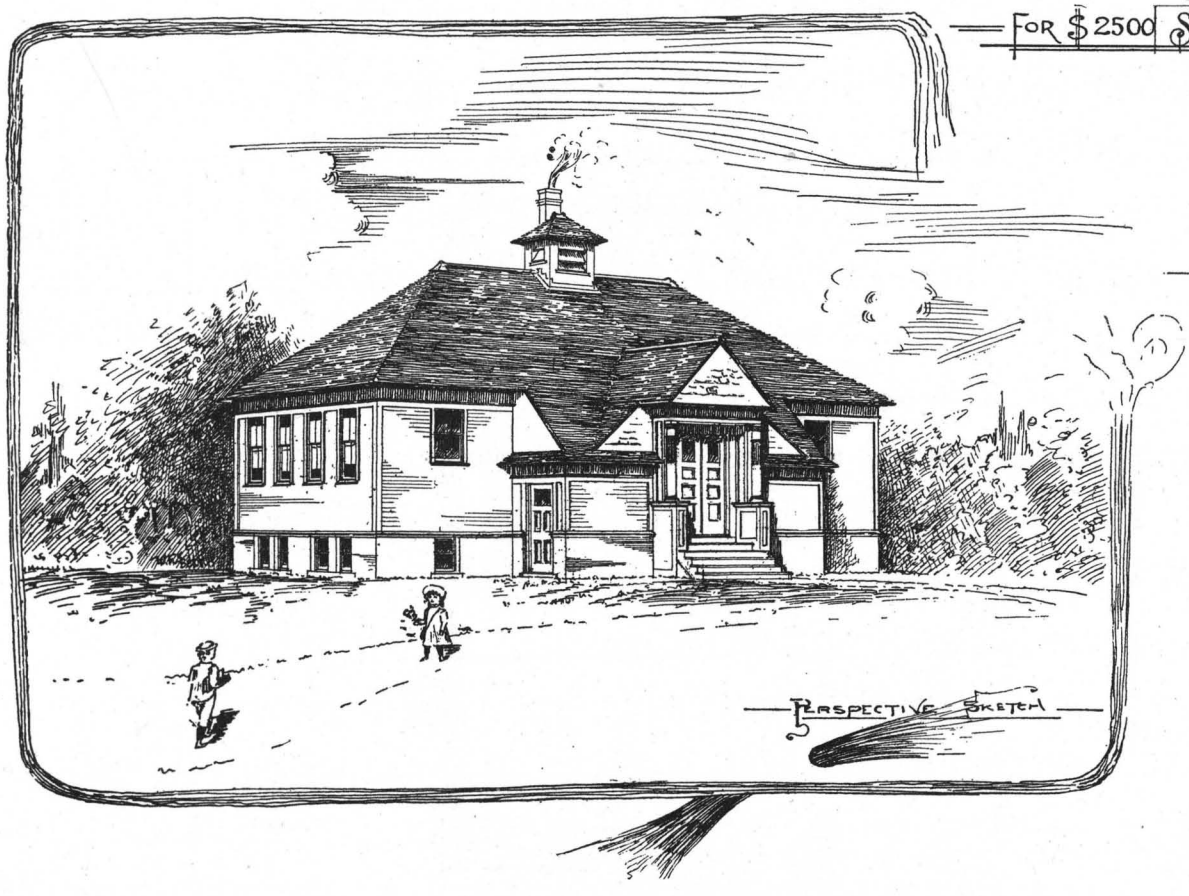
Front Elevation



Plan of Basement

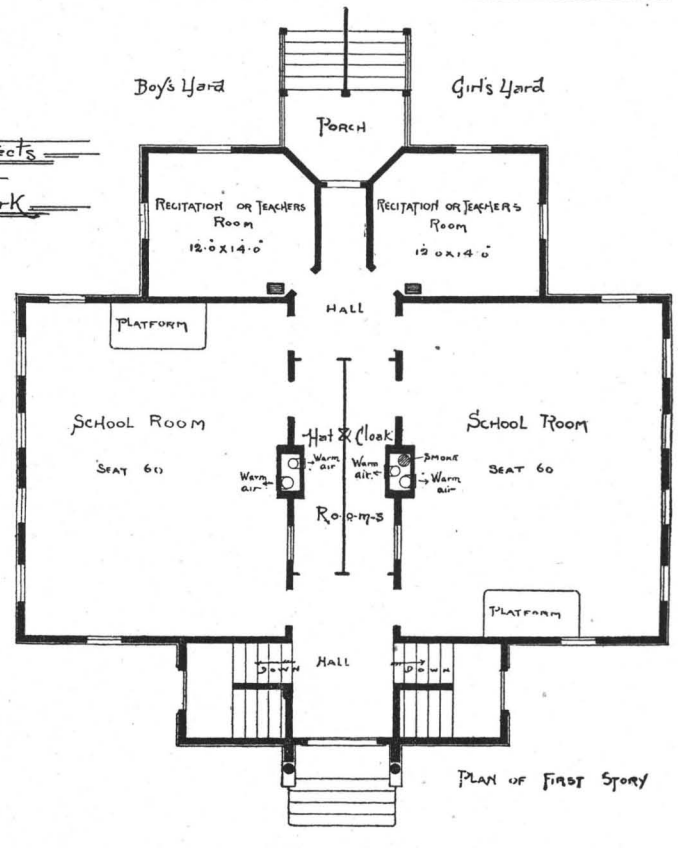
Design

For $2500 School-House – Class 4



Perspective Sketch

Palliser, Palliser & Co. Architects
24 E. 42 St
New York



Plan of First Story

LIGHT.

We must not forget to speak of the paramount importance in every schoolroom of providing an abundance of light—of daylight. Light is life, light is health, light is a physician, light is a beautifier, light is a comforter. Light is life: the sun gives life as well as light; if it were not for the sun all creation would wither and die. There is "no vitality or healthful structure without light." Light is health: it oxygenizes the blood and renovates and invigorates the frame. Light is a physician: it drives away many diseases, as the mists vanish at the approach of the sun; and it cures numerous ailments which drugs alone are unable to relieve. Light is a beautifier: it tints the cheeks with a roseate hue, and is far superior to "cosmetic, wash, or ball." Light is a comforter; it brightens the countenance, cheers the heart and drives away melancholy.

"Prime cheerer, light!
Of all material things first and best."

Look at the bloom on the face of a girl or boy constantly out in the fields or of rustic occupation. What is it that makes their spirits bright and tints their cheeks? An abundance of light. Behold the pallid, corpse-like countenance of the factory girl. What blanches her cheek? The want of light, of air and of sunshine.

The want of light stunts the growth, dims the sight and dampens the spirits. We have always opposed the use of the outside wooden blinds on the windows of dwelling-houses. The lady of the house to keep off the sun from the furniture and carpets will keep the parlor or sitting-room window blinds closed tight, hence they save the fading of their furniture, and instead of which they take a viper into their homes that will surely fade their own and their children's cheeks. It is a grievous sin to keep out from a dwelling the glorious sunshine, and how much more so is it to arrange a schoolhouse so that the sunlight cannot penetrate every part of it, as in every part of the schoolroom the pupil needs the best of light so as to accomplish his task with facility and ease. Light banishes from rooms foulness, fustiness, mustiness, and smells, and there is nothing like letting daylight into dirty places. The sun is the best purifier and disinfecter, therefore let the open window be the invitation for the sunbeam to enter, for truly the light is sweet and it is a pleasant thing for the eyes to behold the sun.

The schoolhouse should be located in a high, dry, open lot, where no buildings adjoining can overshadow it; if possible a few trees should be on the grounds, but far enough from the building so as not to shut out the sunlight from any part of it.

The arrangement, shape, size and locating of schoolrooms has not received that consideration that its importance demands. Too often the aim seemed to be to get the maximum of pupils into the minimum of space. The matter of convenience and lighting has been regarded as of minor importance. Schoolrooms to subserve those purposes, should be in the shape of an oblong, the sides of which bear the proportion of four to three, and each room giving the required amount of cubic feet per pupil, and since so large a part of a child's life is spent in school, and at a formative period, when the impressions made by the surroundings do so much to shape the life of the future man or woman the schoolroom should be made not only the healthiest, but the brightest and happiest spot of his or her life.

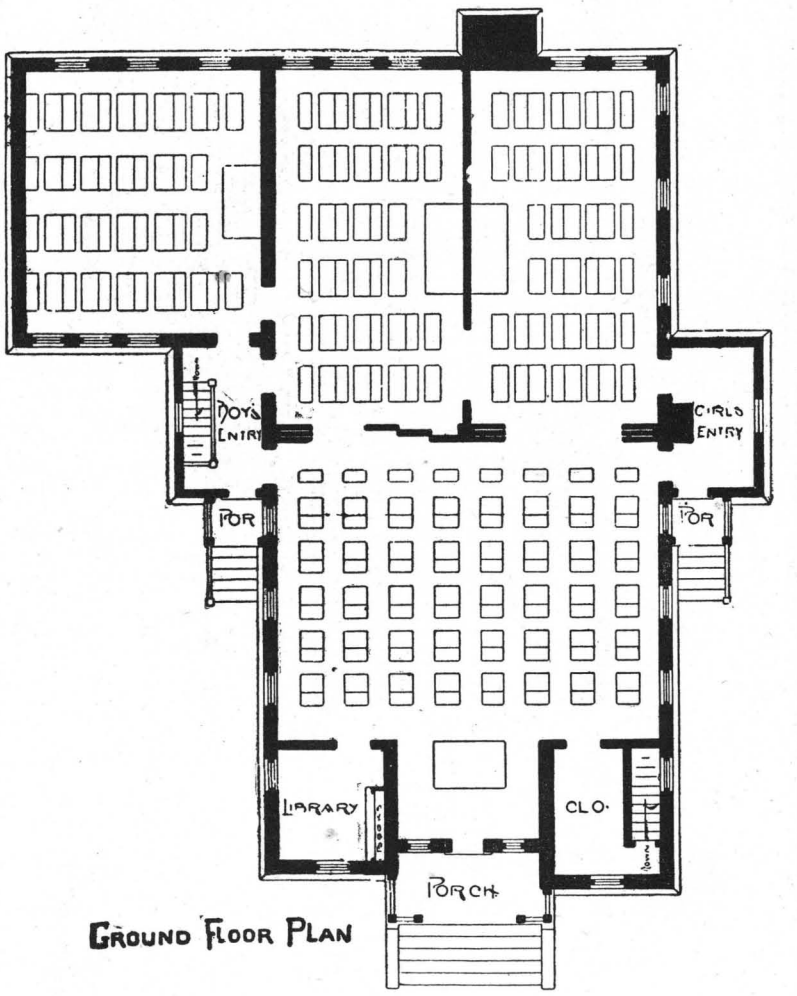
Small windows, often half shaded by dirty blinds or torn curtains, are common defects among our schools. The glass is not kept clean and the furniture, wood-work, walls and paints often increase the general gloom.

The internal wall surfaces should never be whitewashed or colorwashed, and the ceilings should never be of dark wood. It is far better to have impervious polished walls by the use of soapstone finish, which has no glare and can be washed and thus kept free from impurities, and which at all times in its natural tint is soft and restful to the eye.

The proper lighting of a schoolroom should never be overlooked, as very much of the happiness of the children depends on the amount of sunlight admitted. The depressing effects of a dull day are often due to the absence of sunlight. The best way to stop a canary singing is to cover his cage with a shade; and the bright spirits of children are similarly affected by dull, dark schoolrooms. The mental effect of deficient light is also generally accompanied by physical effect. Human beings, like plants, grow weak and pale without light. There is a proverb which says: "Where the light cannot come the doctor must." It is noticeable, also, that the attendance in a badly lighted school is always less regular than in a cheerful, well-lighted school.

It seems to be an open question with many whether the light should be admitted from both sides, or over the left shoulder of the scholars only. In some small village and country schools it has been considered satisfactory to place the windows on both sides of the room, with shades for one side, if too much light or a too strong light from the right-hand side. We have, however, come to the definite conclusion that light should be brought over the left shoulder of the pupil, the window sills should be 3½ feet above the floor, and windows should reach up to within a few inches of the ceiling, and not less than 8 feet in length; they should be grouped together with as little dead space in mullions or piers between them, as is consistent with proper construction. The best light comes from the highest point, and much of the cheerfulness of the schoolroom depends upon the amount of sky visible. Shades should, therefore, be made to roll or slide from the middle toward the top and bottom.

The window area is variously estimated from one-third to one-sixth of the floor area. This, however, must vary with the outside surroundings. The direction of the light is also a matter of great importance. See page 107 of this work for an illustration of bad lighting arrangements in a schoolhouse; also please see cut of ground-plan below of a fine-appearing schoolhouse erected in a New Jersey town less than twenty miles distant from New York City, in which every room is badly planned for light, to say nothing of its miserable arrangements in all other respects for school purposes.



GROUND FLOOR PLAN

The worst light in a schoolroom is that which comes from windows facing the scholars. A light from behind obliges the scholar to sit in a twisted position in order that his book may not be in the shade. The best light is that which comes directly from the left, and does not necessitate any other than an erect posture that it may fall directly on the desk. The lower lights are of comparatively little use in admitting light for study, as it comes too horizontally.

No scholar should be seated at a greater distance than twenty-four feet in a direct line from the nearest window, and if possible the nearer to eighteen feet the better, and is the safer extreme distance at which to place the scholar from the window.

Architectural effects, which the æsthetic demands of the times call for, should always be made subordinate to this most important of all considerations, "abundant light," and consequently should never be allowed to interfere with the proper placing of a sufficient number of large, serviceable windows in each schoolroom.

Since all our knowledge of books comes to us through the eyes, it is of the utmost importance that every means be employed to protect the eyes from injury, and for increasing their strength and usefulness.

The principal cause of near-sightedness being the long-continued use of the eyes on near objects, in an inadequate or ill-directed light, during the years of most active bodily development, for after adult life has been reached without bringing about these changes and defects of the eyes, there is very little chance of their commencing, even with a large amount of near work. Careful tests should be systematically made of the condition of the eyes during this period, and clear, wide-spaced types should be used in school books, and the lines should not be too long.

Every school should have a playroom or gymnasium, and it should be insisted on that every scholar, and especially those of a more delicate build and near-sighted tendency should be obliged to use it to a proper extent, and under careful supervision, with a view to the alleviation and counteraction of their physical defects.

VENTILATION.

There cannot be given any good excuse why teacher and scholars occupying any schoolroom should be required to breathe anything else than the pure air of heaven, rather than the close, contaminated air, and, therefore, the highly poisonous gases given off by numbers of persons in a non-ventilated schoolroom. Observe the effects that a large assembly in such a room has on the system—the headache, the oppression, the confusion of ideas, the loss of appetite, the tired feeling, followed by a restless night,—all tell a tale, and loudly proclaim that a non-ventilated schoolroom is not a fit and proper place for children and the youth and maidenhood of the land, as by their breathing the same air over and over again, they are literally "poisoned by their own breaths!" This is not an exaggerated statement—alas, it is but too true!

Every State Legislature should enact stringent laws to ensure the thorough ventilation of every schoolhouse, and a system of inspection by competent persons, clothed with authority to put padlocks on the entrance doors of all that are found improperly ventilated, and prohibit their use until such time as they are made perfect in this regard.

It is hardly less humane to kill a child, than by wilfully ignoring hygienic requirements to cripple it for life physically, mentally and morally, as children are being crippled to-day in the vile atmosphere of many schools.

An ordinary comprehension of ventilation as applied to school buildings is the effectual and constant removal of vitiated air, and at the same time the proper introduction of a supply of pure air. This is extended by the provision that all the air introduced be fresh air from without, uncontaminated with impurities before entrance into the building, and, in transit through the ducts, properly warmed in cold weather, and with so low a velocity of admission into the room that the current be scarcely more than appreciable. In popular language, that there be no "drafts." If, furthermore, it be stipulated that the quantity of air introduced be sufficient in amount to render the atmosphere comfortable, and the direction of motion after entrance be such that the fresh air is distributed throughout the room, we would seem to have covered, in general terms, without specifying amounts and velocities, the ordinary requisites of what is understood by proper ventilation.

In one important particular we would, however, have left an erroneous impression; viz., as if the air within a room were composed of two layers or divisions; the one the vitiated air, the other the pure air, and that the vitiated air—the heavier and, accordingly, the bottom division—could be removed in bulk, leaving the room filled with air of original purity. The mere mention of the law of diffusion of gases will suffice to dispel this erroneous view, so widely circulated among laymen of all classes, and held by not a few architects, physicians, builders and others, who have a directing voice in matters affecting the proper ventilation of buildings.

As a fact, of course, there is a constant, continuous mingling of the vitiated and of the fresh air, depending on their relative temperatures and densities, and mainly on the absolute motion of the air in the room. In other words, a process of dilution of the vitiated air exhaled by man and the air in the room is constantly going on, and the fresh-air supply must be adequate to keep the air breathed by the inmates at a proper standard of purity. It is not as if man, within a building, inhaled the fresh air of purity of external atmosphere, and then the exhaled air left the room (by presumed process of ventilation) without mingling with or contaminating the air in the room, and then another inhalation of pure air was taken, and thus the process continued. As a fact, the exhaled air mingles with and contaminates the entire air in the room, and the air removed by process of ventilation is of the same composition as the air we breathe, neither of the purity of the entering air, nor of the impurity of the exhaled air, but of a standard degree of purity, dependent on many conditions, but within our command.

Of course, in school buildings, the air breathed is vitiated by other sources than individuals; by the products of combustion, of light and heat-producing media and by other sources that suggest themselves. The amount of fresh air introduced should be sufficient to dilute the vitiated air to a healthy condition, and, of course, the admission of a given quantity of air is conditional on the simultaneous removal of the same quantity.

No provision can be made for preventing, by means of ventilation, the dangers that arise from the presence of sewer gas and its disease germs. These should be kept out of the school building by proper appliances, and while an active process of dilution and removal of air from a room in which these germs are permitted to enter, will, by the theory of probabilities, diminish the risk of the individual germ striking the inmate, the risk remains too large to be trifled with in that way, and the source of contamination should be removed.

The problem of ventilation, therefore, should be made perfect, and at the same time as simple as possible from the start, by the architect embodying all the details of same in his plans for the construction of the building, the locating of apparatus, ventiducts, inlet and outlet openings, etc., etc. Some one may here say, "Why, what do most architects know about this sort of thing?" If they do not know all about it they are certainly not architects, and are positively not the proper persons to design and construct school buildings.

The warming and ventilating system should be so designed by the architect that the room in the basement be not so cut up and destroyed for the purposes of boys' and girls' separate and liberal playrooms, and this should be insisted on in every case, as it is perfectly practicable no matter what the architect or constructor of the apparatus may say.

As far as possible, flues and air ducts should be located away in the centre of the building and not in the outside walls, which are cold and necessitate a great waste in fuel to make the air in them warm and prevent down drafts of cold external air, and this cannot be wholly obviated, not even by the most expensive methods of constructing flues in outer walls.

Chimney flues or smoke stacks should never be less inside than 12 x 12 inches in size if square, and not less than fourteen inches in diameter if round. Defective flues in schoolhouses are too common, and a poor draft, besides being fatal to good warming, also causes waste of fuel.

The inlets for the supply of fresh air to the building should be ample and located at least on two sides of the building, and where no foul gases or odors can be wafted to same through the action of winds, and they should be so located and constructed that they are both water-proof and air-tight, so that no leakage either of gases or liquids from drains can enter them at any point. Cellar air will also get into the ducts if not made air-tight. The fresh-air inlet and distributing ducts should be of galvanized iron, or perfectly tight masonry construction.

The provision should be made that the incoming air will be warmed to an agreeable temperature, and admitted to the schoolroom at a height of from six to ten feet above the floor; the velocity of admission can be higher when it is admitted near the ceiling. To avoid drafts the inlet and outlet openings must be large, and, for warming very large buildings, the best for the purpose is a steam-warming apparatus, with which is introduced a method of moistening the inflowing air immediately after it has passed through the coil. The quality of moisture in the air, though not considered by modern hygienists to enter materially as a problem of health consideration, is of importance as a matter of comfort. Warm-air furnaces are usually supplied with large water pans constantly filled with water over which the air passes, and these pans should, when possible, be supplied direct from the water service with the aid of a float-valve. The temperature of a schoolroom, to be perfectly comfortable, should be kept at 68 degrees Fahr., and the playrooms and halls at 50 degrees Fahr.

It is a fact that the desired maintenance of temperature at about 68 degrees Fahr. acts as a strong drawback against the securing of the proper air supply, since, when this temperature is exceeded, if it is possible to do so, the incoming warm-air registers are immediately closed by the teacher, and the systematic fresh-air supply is thus curtailed or entirely cut off, therefore the registers, or more properly the light screen covering to both the incoming and outgoing air openings in a schoolroom should be of that character that nothing can possibly be closed or done to prevent the constant flow of air, as a certain and effective remedy for an excess of temperature is found in the provision of what is known as the "mixing valve." In this device the branches of the distributing ducts in the basement connecting with the steam-coil jackets are so arranged that the air either travels up the fresh-air flue without passing over the heat-radiating surface, and thus enters the rooms at an external temperature, or a portion of the air is heated by the radiating surface, the rest passing up unwarmed, not having touched the coils, or the entire air supply passes over the coils and is warmed. The whole regulation is effected by a switch-damper in the basement, operated by a lever or chain in the room, at the register, the lever or chain passing over a plate so that it can be fixed at "warm," "mixed," or "cold," as may be required. In this way the fresh air entering the room may, at will, be at any required temperature, and if the atmosphere in the room rises above the desired degree, the register need not be shut (and thus cut off the fresh-air supply), but the teacher has simply to fix the lever, and secure the same volume of air at a somewhat reduced temperature.

Comparatively speaking, this arrangement is so simple and inexpensive, and enables each schoolroom to be at any temperature desired without the fresh-air supply being encroached upon, that it is surprising it is not always adopted.

The closing of the incoming fresh-air duct when the schoolroom becomes too warm, and the letting in of the foul air from the ventiduct to cool off the room, is an abomination and a gross breach of what is a proper provision to meet the requirements, and yet we have seen it provided for and practiced in schools warmed by indirect steam, and also in those warmed through a warm-air furnace system, the latter as expensive in the plant and running as the indirect steam; and, again, when the apparatus has been found in very cold days insufficient for the requirements, an attempt is made to assist it by retaining the air in the schoolroom by placing a sheet of paper over the opening of the ventiduct, or by a peculiar device that we have only seen practiced on one warm-air system, that condemns itself at once to the mind of every intelligent person who observes the operation that gives the warmth on a very cold day at the expense of the proper ventilation of the room.

There is an effective and automatic method of regulating the temperature, although one of greater cost, and that is by the use of thermostats. The thermostat apparatus consists of a thermometric device, in which the variation in the expansion of metals by warmth serves to open and close an electric circuit which, in turn, controls the flow of compressed air, operating a special steam valve on the steam coils. In this way the steam is intermittently turned on, and shut off from, these coils in the basement, and the air, passing over the radiating surface, enters the duct at a varying temperature. So the temperature in the room is automatically kept uniform without a diminution in the fresh-air supply.

As the true meaning of ventilation is defined by the standard of carbonic acid dilution, it is evident that a cold room may contain very impure air, and a hot room pure air. Indeed, this is far more frequently the case than would appear at first thought. If a room is warmed by warm air through a register, and the temperature of the room increases beyond what is considered pleasant, the first thing done is to shut the register to reduce the warmth, which also shuts off the only supply of pure air; and, having stopped this fresh-air supply, the air within the room becomes impure even if its temperature falls.

It cannot be denied that moderately warm rooms are considered more comfortable by the occupants than hot rooms, and this comfort is to be commended, if it is not purchased at the expense of having the air unfit for respiration.

We have already referred to some methods by which both moderate temperature and pure air can be secured at the same time; that is to say, the amount of the fresh-air supply need not be decreased with desired decrease of temperature in the schoolroom. At present, however, it is our aim to emphasize the fallacy of the popular notion of hot air in a room being necessarily impure air, and cold air being necessarily pure air. It is evident that when our clothing is lighter, the temperature in the room may be higher without discomfort, while, if in the winter months we were to select the warmest apparel for within doors, we would experience comfort at temperatures now considered uncomfortable.

Ordinary ventilation, such as we find in a dwelling-house, is entirely deficient for a school. Public schools, and schools generally, erected prior to 1880, were, as a rule, not ventilated at all, and in instances where an attempt was made, the same fell so far below the proper standard and requirements, that properly warmed and ventilated schools in this country are unfortunately few and far between, as compared with the total number. Thousands of them in this respect are a disgrace to this age and civilization.

The principal faults to be found in schoolrooms as regards their ventilation, are that too little cubic space is allowed in proportion to the number of pupils seated, that an insufficient quantity of pure air is admitted to expel the foul air, and that in many cases when a sufficient quantity is delivered into the room, it is introduced and led out in such a manner that the desired result is not attained. Every particle of warmth entering the room should be utilized before it is drawn off in the ventiduct and allowed to escape; it is absurd to bring in quantities of fresh, warmed air at the floor level of a room, and send it out in double-quick at the ceiling level, without it having traversed the room outside of an almost direct line drawn from the incoming to the outgoing duct, as shown by Fig. 1. The dotted lines indicate the breathing line of the scholars seated in a schoolroom. The air when introduced at the floor and removed at the inner wall near the ceiling, does not accomplish the desired results for the occupants of the room. The natural direction of the air as it enters is directly towards the ceiling, where it stratifies along its surface to the outlet, as shown; the incoming air being warm and light, naturally rises and flows across the top of the room to the outlet, while the foul air, being dead and heavy, remains at the bottom, becoming constantly more impure. No doubt there is a certain amount of mixing going on, but the greater quantity of the fresh warm air takes a direct line for the ventiduct; this results, as will be readily seen, in an enormous loss of warm air without gaining the very point aimed at—the utilization of every portion of the warmed air before it passes out of the room, driving as it should before it the air already in the room. If anyone doubts the correctness of these statements as to the action of the air, let him fill the incoming duct with smoke, that can be seen, and observe its course as it enters, flows upwards to the ceiling and outward through the ventiduct, and then they will readily comprehend what becomes of the volume of warm fresh air.

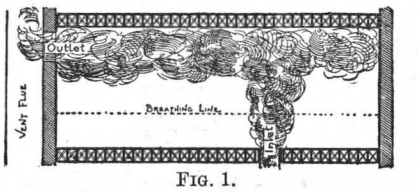


FIG. 1.

FIG. 2.

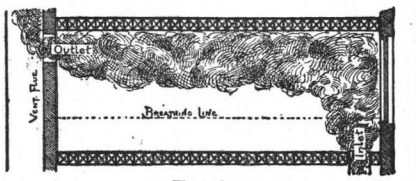


FIG. 3.

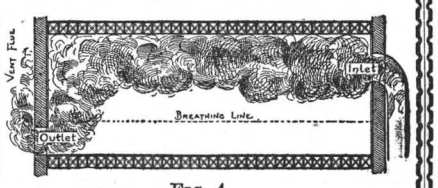
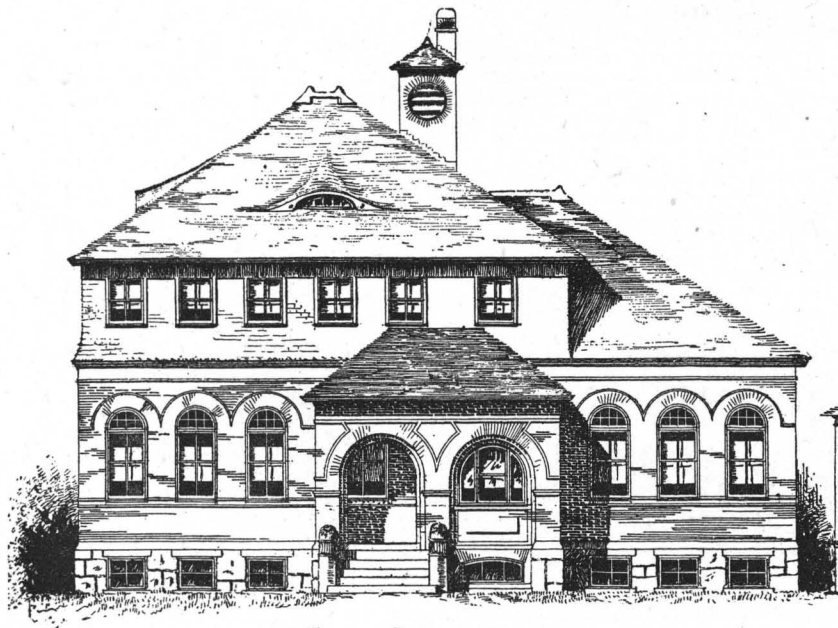


FIG. 4.

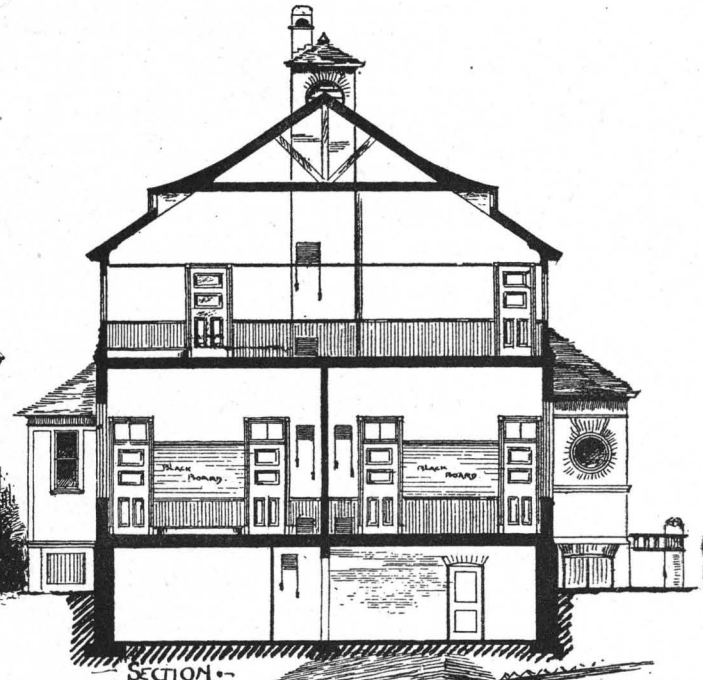
FIG. 5.

In Fig. 2 the outlet is in the same position, while the incoming air opening has been raised to within 2 feet of the ceiling level. In Fig. 3 the openings are similar to those shown in Fig. 1 with like results, while in Fig. 4 the outlet opening is placed at or near the floor, having the effect as shown. In Fig. 5 both openings are at the floor level giving a slight improvement in the results obtained, but not by any means satisfactory. These various Figures show the obtainable results of the incoming and

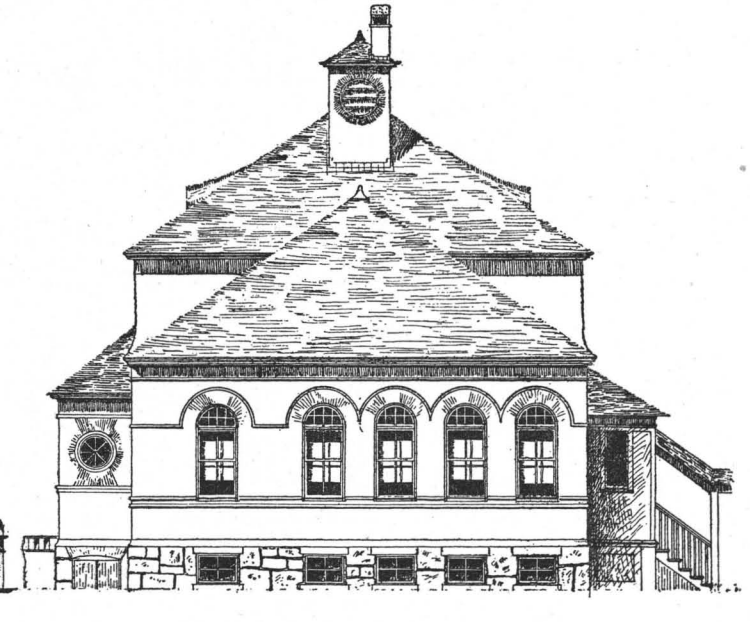
(*Concluded on page 58.*)



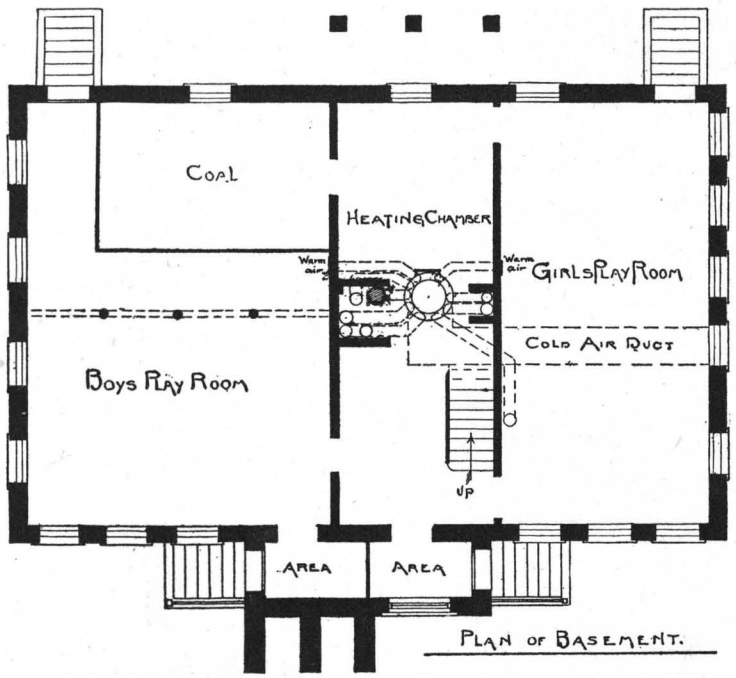
FRONT ELEVATION



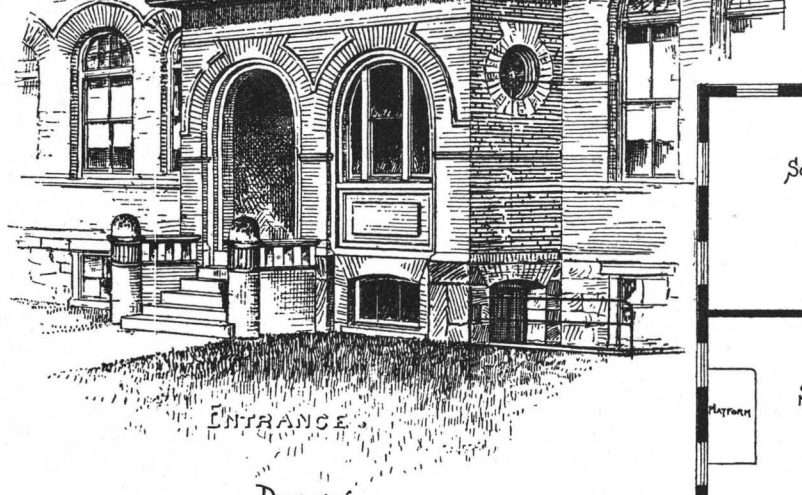
SECTION



SIDE ELEVATION

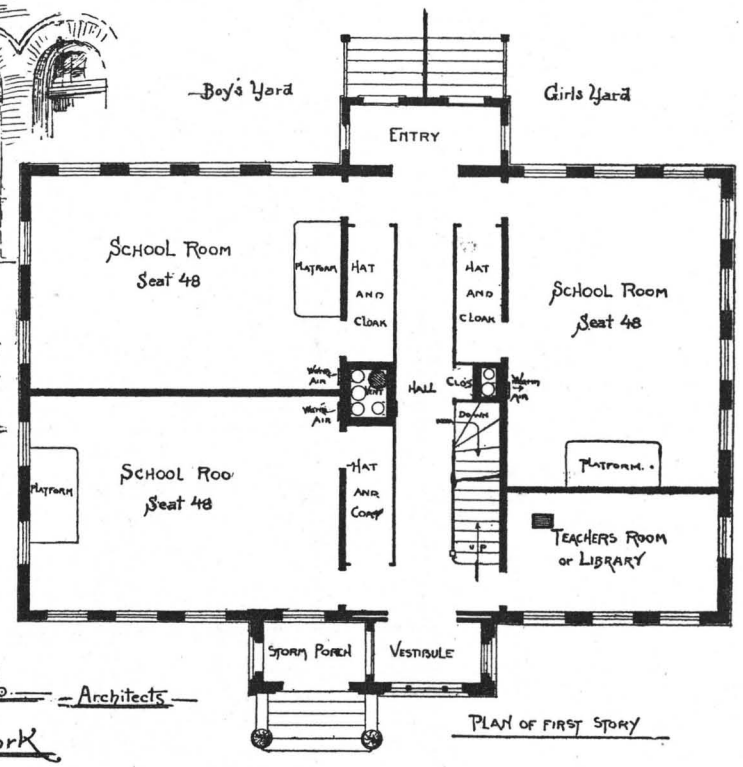


PLAN OF BASEMENT.

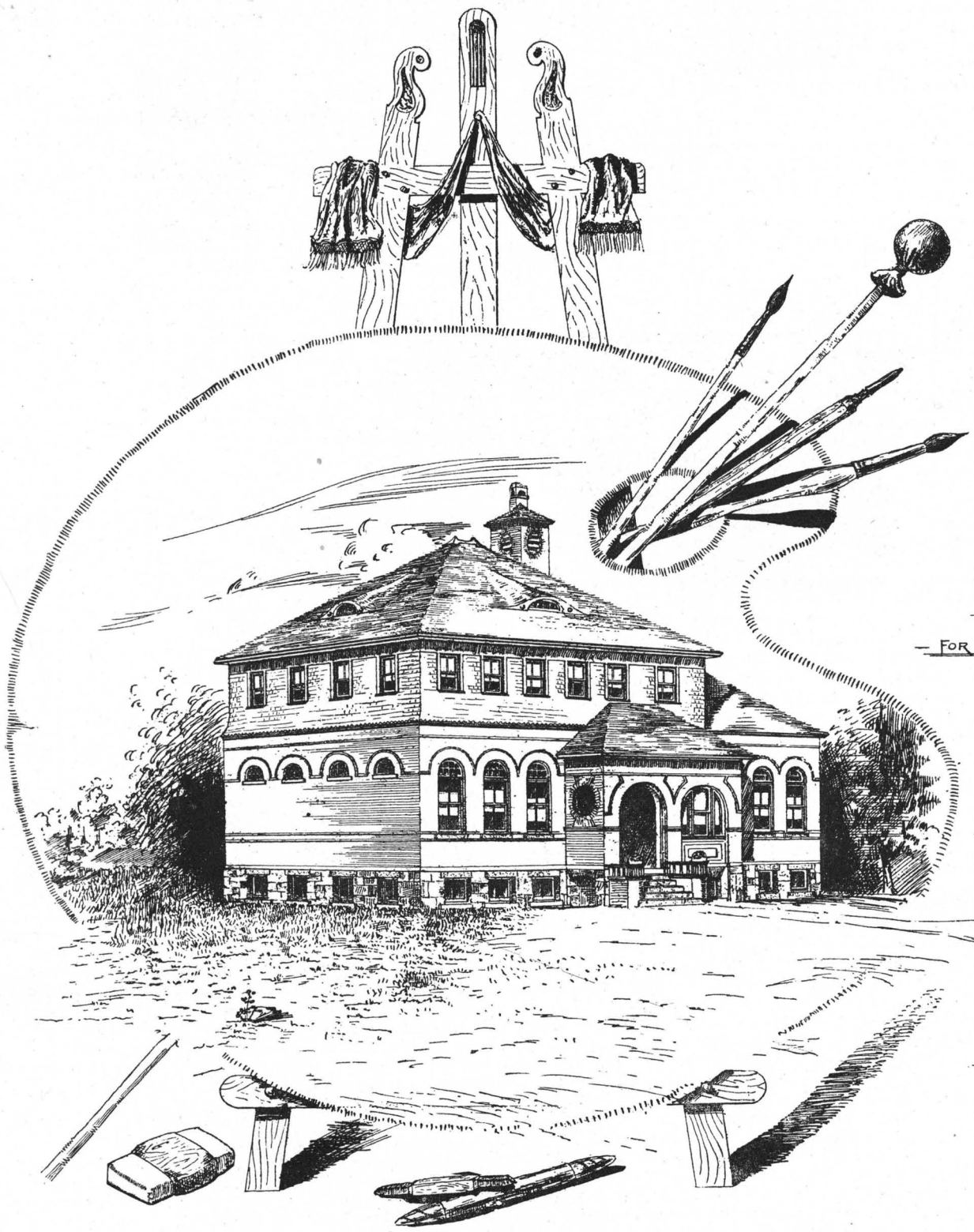


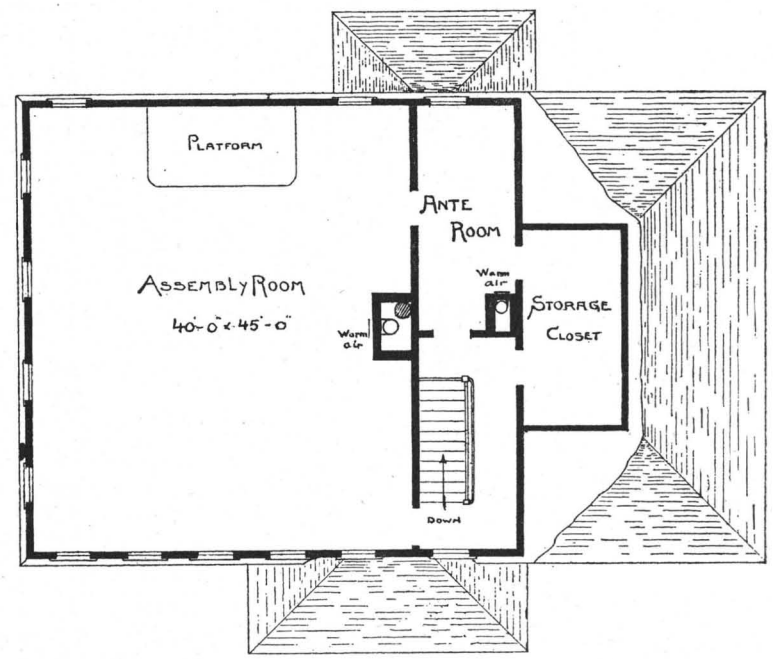
DESIGN
FOR $5000 SCHOOL HOUSE - Class 5

Palliser, Palliser & Co. Architects
24 E. 42 St.
New York



PLAN OF FIRST STORY

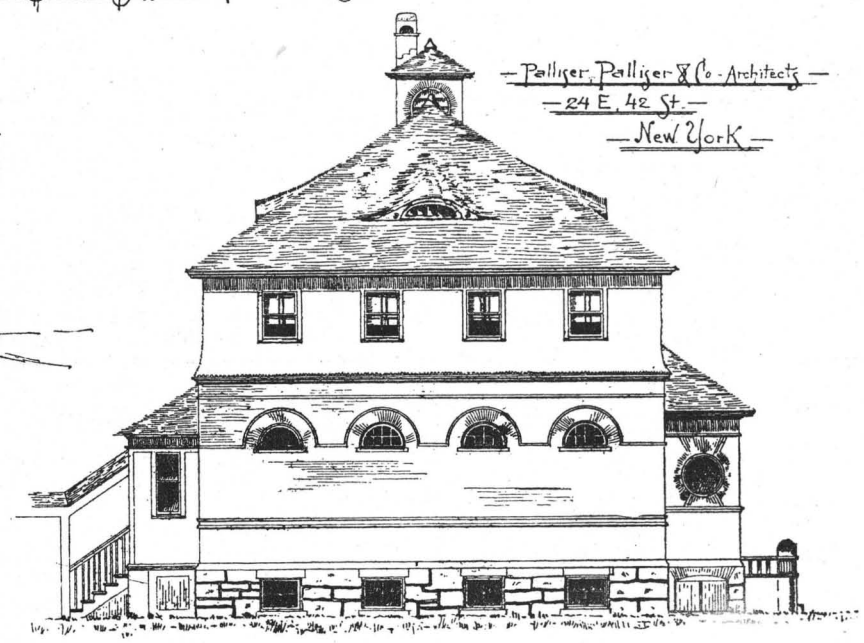




Second Floor

— Design —
— For $5000 School-House - Class 5 —

— Palliser, Palliser & Co - Architects —
— 24 E. 42 St. —
— New York —



⇒ Side Elevation ⇐

Ventilation (*Continued from page 55*).

outgoing currents of air when the inlet air-duct openings are in various positions on one side of the room with the outlets to ventiduct on the opposite side of the room.

We have proven time and time again by actual work done that no matter what system of warming the air is employed or whose apparatus, patented or otherwise, is placed in the building for warming and ventilating the same, the ducts either of metal or brick, should be carried up in the

FIG. 6.

centre of the building, the air entering the room at or near the ceiling with the outlet duct directly under it at the floor level. The motion of the incoming warm air is toward the outer and cooler walls of the room and down the surfaces of the latter to the floor, wending its way back to the ventiduct opening, traversing the entire space of the room in a circular motion as shown in Fig. 6. All the patentees, constructors and setters of school ventilating apparatus of whatever kind have at last come to the conclusion that this is the correct method, and all are now carrying out the same in their work with good results, while 5 or 6 years ago they only laughed at our methods in this respect. (See plans and details of The Fowler School Building, Cleveland, Ohio, and plans of Cherry Street High School, Elizabeth, N. J., illustrated in this book.)

To maintain the air in a good sanitary condition in a properly constructed schoolroom, the amount required is not less than 30 cubic feet of air for each occupant per minute. For 50 pupils this amounts to 90,000 cubic feet per hour, which amount must be introduced and thoroughly distributed without creating unpleasant drafts, or causing any two parts of the room to differ in temperature more than 2 degrees Fahr., and the most satisfactory method of warming, as far as fresh-air supply is concerned, is the indirect system as used and designed for every schoolhouse constructed from our plans and specifications in which all the warmth entering the rooms represents warm and pure air.

How many schoolrooms in the country come up to and provide the requirements just alluded to; in a great many cases they are not provided with one-tenth of the requisite amount of air, and even then it is not brought in properly and is as a consequence not effective. A system of forced ventilation should always be provided either by internally heating the flues, or by the aid of a fan, and in all other instances the ventiducts no matter where placed or how constructed are worthless for ventilating purposes. Good ventilation cannot be obtained in a schoolroom provided simply with flues warmed only by the air current entering the same from the room. On people going into a school building it has always been natural for them to look up and ask about the ventilation and especially so when radiators for heating purposes are noticed in the rooms and halls along the walls and under the windows, the teacher points to several small openings and black japanned registers with cords in the walls near the ceiling. Poor deluded fools, this is not ventilation. It is merely an expression of what does not exist.

The bad air in a schoolroom must be expelled by the pure fresh air through the aspirating ventiduct in such a way as to prevent as far as possible intermixture, and so that the pure fresh air will be maintained at a slight pressure in the room, so as to prevent the entrance of the external air through the crevices, around window frames, etc., and all the fittings, etc., of the outer walls should be of absolutely tight and perfect work.

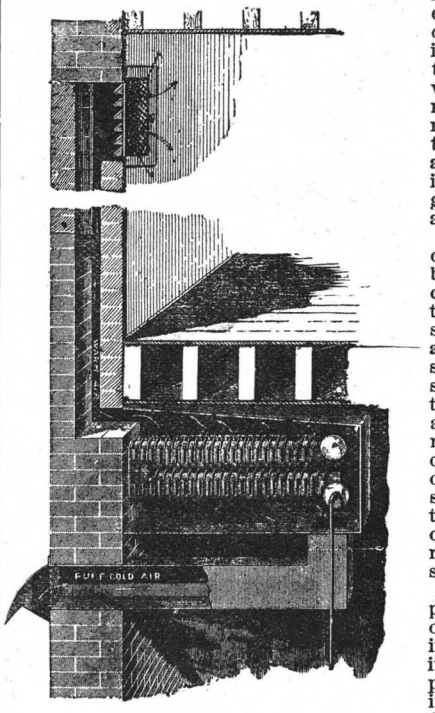


FIG. 7.

Steam or hot water radiators except as auxiliary to the warming by a thorough indirect system with which is included ventilation through an aspirating ventiduct should not be placed in a schoolroom, playroom, wardrobe or hall for warming purposes, no matter what the steam-heating man or anybody else says.

Fig. 7 shows a simple and effective means of adding to the warming capacity if the system should be found inadequate in warming some special part of the building, and it need not necessarily be placed on the outside wall, as the pure cold air supply can be carried on the basement ceiling to any location, also a damper and mixing valve can be added to be controlled direct from the room.

When a connection is made in this way between these radiators and the external air by means of openings through the walls and ducts, so that the air before entering the room will have passed over and been warmed by the radiators, the direct are converted into what is known as direct-indirect heaters. The effectiveness of this fresh-air supply, if properly arranged, depends mainly upon the efficiency of the ventilating ducts provided. As ordinarily arranged the wind often forces in air in such large quantities that it enters the room non-heated, and there is frequently trouble from the entering of dust and other foreign substances, while sleet and ice and other matter so frequently stop up the air inlets, that, while theoretically enticing, the securing of the fresh-air supply in this way is, in general practice, a failure. In most instances where these direct-indirect radiators are located, it will be found that the dampers admitting fresh air are closed, and that the heaters are being operated as in a direct radiation system, therefore great care should be exercised in placing and erecting direct-indirect heaters.

The requisite amount of pure air per occupant of a schoolroom is never supplied by accidental ventilation through poorly constructed doors and windows, though too much stress is often laid upon it by some persons who know no better, as if all the ventilation required could be thus secured. In cold weather, when the outside air thus entering means drafts and the use of more fuel, the leaks are often as far as possible stopped and there being no system of air supply, the air within quickly becomes foul, and the occupants of the room experience the well-known sensations of closeness, weariness and fatigue, while those who, coming from the outside atmosphere, as they enter the room feel as if they could cut the air, it seems so heavy and smells so foul.

If a fan is used it should be to force pure warmed air into and not to draw air out of the building, and in summer time, instead of forcing air over steam coils and into the rooms, etc., ice can be put in their place, so that the air passes over it, cooling the building as desired. This is no doubt the most satisfactory method of air-supply to public buildings, theatres, and large halls of assembly, etc., where steam power or a motor can be had for driving the fans; this is known as the plenum system.

Water closets and urinals should be connected with direct vent flues in which a strong upward draft is constantly maintained, so as to constantly carry to the outer air any foul gases generated in them while in actual use, or at any other time, so that the same will be kept from entering other parts of the building. The proper ventilation of these fixtures to accomplish effective results is of far greater importance than anything else connected with a school building, and if on blowing tobacco smoke on to the seat of the fixtures with the lid open, the smoke does not quickly rush into the closet or trough, and also act in a similar manner when applied against the slabs of the urinal, there is something radically wrong and accounts for the nasty smell so prominent at all times and under all circumstances in the school water closet and urinal, and that all the cleansing by the application of water will not apparently remove.

For small and medium sized schoolhouses containing from one room up to eight rooms, warm air furnaces are unquestionably the best, provided always that the same are of sufficient size and properly located, and of the kind that the fire will bank up in the centre of fire-pot and not come in direct contact with the iron surface of sides, straining the same when fire is pushed to a red heat, causing loose joints and escape of the products of combustion into the fresh-air supply. It should also be remembered that cast-iron furnaces permit, at high temperature, the escape of carbonic oxide through the iron itself. Warm air furnaces require less care than steam apparatus and are quicker to respond and after school there is less waste of fuel. One of the main considerations in warming a schoolhouse is that the rooms are used only five or six hours of the twenty-four. A large amount of warmth is required for these few hours, and little or none for the remaining eighteen. With the proper use of the right kind of a furnace a brisk fire for two or three hours before school begins the rooms will be warmed to 68 degrees Fahr., and after the close of the school in the evening a very small fire through the night is all that is necessary, especially if the ventilating duct is properly arranged so that it can be fixed not to waste the warmth during the night; also in the mild weather of early Spring and late Fall the fires can be kept low and the amount of heat can be easily regulated. See plans of small schoolhouses in this work.

The warming of schoolrooms by stoves placed in them should not be tolerated except in the most extreme cases—stoves are at best an abomination in a schoolroom even when arranged on the very best method as regards the introduction of cold pure air into the jacket around the stove or heat radiator, together with the provision of a proper large flue up which the smoke pipe passes making of it an aspirating duct and available for ventilating purposes.

On the Employment of Architects in the Construction of Schoolhouses, and the Various Methods adopted for Procuring Plans, etc.

Almost all cities, towns and villages have had and are still having building experiences with reference to the building of their schools not at all to their credit, as a result of the methods of ignorant school boards and committees, who do not seek, but rather refuse to accept, expert advice on the subject of plans and the right and proper way to secure the same.

In many instances when a committee desires to secure the services of an architect, or obtain plans for the erection of a new building for school purposes, they have an idea that architects everywhere are ready to respond to any invitation to prepare and submit plans, and to a great extent architects themselves are to blame for this, as offers to do this generally come from them first; an advertisement—that the committee will receive plans, specifications and bids or proposals—is sent out, but as they seldom conduct the business in such a way as to satisfy the capable members of the architectural profession, they therefore fail of the object sought. Architects who go into these promiscuous competitions seldom know anything about building, and much less about schoolhouses, and, in fact, there are but few architects who are competent to design and erect such buildings, but still they do so either through the efforts of their friends or their political pull, or for some other local reason, not the right one, which should be that they are fit and proper persons to do it by reason of special knowledge and study of the subject.

A few years ago the City of Brooklyn advertised for plans and specifications for model schools, and offered $200 for the best submitted, but the terms were so ridiculous and asked for so much, that the building journals took up the matter and warned architects not to touch it, and only one architect sent in any plans, and then the board or committee tried to evade the payment of the $200 to him on the grounds that there was no choice, as if that was his fault, but they finally had to yield on account of public opinion being on the side of the architect, and finally it was found that the committee had failed to insert in their advertisement that they reserved the right to reject any or all plans, and the Mayor, Seth Low, taking the matter in hand, the architect got the $200, and the city was so much out of pocket on account of the smartness of their Board of Education.

A city located less than one hundred miles east of New York had a great experiment in the construction of their High School, which is interesting. They advertised for plans for a building to cost $55,000, to which about ten architects in New England responded, and the job was awarded to a young and inexperienced man in the city where the building was about to be erected, for reasons which were fully explained by the ruling spirit of the Board of Education to another architect in the city at the outset, when he was making inquiries about requirements, etc.; frankly told him it would be useless to waste any time on it, as he had a struggling architect tenant who owed him $700 for office rent, and he would have to give the work to him regardless of the other plans that might be submitted, and this part of the programme was carried out to the letter, but we understand this same architect does not build any more schoolhouses in that city.

This architect's plans and specifications, on account of his lack of knowledge of construction and costs, had to be redrawn and cut down four times, the first he drew figuring up to $85,000, and finally an entire story was cut out and modified in various ways to get it built for $55,000, the amount appropriated, and to get the required accommodation. Schoolrooms had to be placed in the basement, cutting out the space for playrooms, while a more experienced and practical architect would have given three stories of schoolrooms, and kept the basement for playrooms, etc., and accomplished it within the amount of the appropriation; but this was not all. At completion it cost the city upwards of $20,000 more to fight the contractor in a lawsuit and pay his bill by reason of extras, charges, experiments, defective plans that did not agree and could not be followed, etc. A member of the School Board told the writer that it was an experiment on the part of the architect from beginning to end, as he had never built a schoolhouse in his life, and the city had to pay dear for his experience; that the architect received his pay long before the building was finished, and did not care a straw. On one occasion he specified floor joist 6x16 inches in size, placed 16 inches centres, and when it came to detailing the trusses carrying the roof over the high-school room, he employed an engineer to do it for him, though it was a very simple problem which any good builder could have accomplished easily enough; and this engineer, when looking at the building, remarked that it was a regular abortion and waste of material, and yet this same architect is an associate member of the American Institute of Architects, and one of the twenty-eight who met in convention in New England six or seven years ago, and were photographed and written up as to their specialties, etc., etc., and as soon as it was issued this architect had his local newspaper comment upon the same, he being one of the group, and that he was a member of the Institute, and representative in convention of the architects of America—a you-tickle-me-and-I-will-tickle-you institution—that has as yet failed to accomplish anything, and is not likely to so long as they admit to membership such men, whose work and details are laughed at by good mechanics; and who announced to his contractors that he would not in future put any figures for sizes of glass on plans but let them figure out the same in their own way, and this was just because he was so impracticable that in giving details for stonecutters' and other work about the windows, had made many mistakes by reason of his inability to figure out correct width of openings after giving sizes of glass, so that everything would come together right and fit; therefore he would in future only draw them in the elevations, and let the builders calculate them out in detail themselves as best they could. He would merely furnish them, as it were, a sketch or idea for them to carry out. Very weak in an associate member American Institute of Architects.

This shining light of the architectural profession is possessed of less brains and knowledge on matters of architectural art and building construction than students of but one year's service in our office. Great Cæsar, we knew him well as a $15-a-week draftsman just before he opened an office, and his methods are founded on gall and pull, in fact they are his stock-in-trade. He got a rich manufacturer for a client once, and designed him a residence which was a joke, and the owner was so disgusted with the interior details and finishes, that he employed a good woodworking mechanic to design new work, and tore out all that was executed from the architect's designs.

Schoolhouses should be designed and constructed by accomplished and experienced architects selected without regard to personal or political considerations, and the service should be such that the expenses of planning and supervision of buildings will not exceed three per cent. on the total cost of the same, and this has been done and thoroughly by several of the moderately sized cities in and around New York; and the large cities whose Boards of Education maintain an architect's office to carry on this work should do it easily enough, although it is a fact that such is not the case, and that ten per cent. is nearer to their cost.

It is obvious that an architect who has to ask everyone he comes in contact with whether he is going to vote for his man or not, or who holds his place on condition of delivering a certain number of votes to the person from whom he holds his appointment, can be no longer the strict and vigilant guardian that a city needs to look after its interests in building matters. An architect rarely does his duty to his employer without wounding the sensibilities of the contractors with whom he has to deal, and one placed in office for the purpose of making things pleasant all around for a large circle of draftsmen and mechanics has opportunities for doing so only limited by the amount of money which can be secured by appropriation for doing a given quantity of work.

It is well known that where politics are very corrupt, the architect employed by the school board to do their work has been required to return, for political purposes, one-half of his fees, and to otherwise make commissions of 25 cents per foot on the stone, 25 cents per thousand on the bricks used, 25 cents per square on the slate, and so on throughout, in fact, to take toll on all the material and other contracts entering into the construction of the building, and to deliver one-half to the political heads for their purposes. Across in Jersey, a New York stone-dealer supplied the rough stone for a building, and paid $600 cash for the privilege, and was told by the architect that every one who furnished or did anything on the job had to pay in a similar tax for political purposes, and in addition to his paying in this $600, one of the politicians, who kept a saloon, had the nerve to ask him to endorse his note for $1,500. What a spectacle!

And yet it is stated openly by the architects in Jersey that one of their number got a large job by paying the mayor and three commissioners $10,000 ($2,500 each) to award him the job, and that other architects offered various sums, from $6,000 up, to be so favored, but that the highest bid prevailed with the committee of four who made the award, and the architect thus selected will receive five per cent. on the cost of the building, which amount he must, of course, increase by various questionable practices.

A prominent citizen resident in a village on Long Island, about six miles from New York City, called at our office and stated, We are about to erect a $30,000 schoolhouse, and I can get you the job to make plans, etc., but first I want to know how much there will be in it for me; to which we replied, "*Nothing*," and we heard no more from that quarter as he was in it for revenue only.

A builder who estimated on a certain L. I. village school was told by a member of the Board of Education, that he knew all the contractors' figures, and that he could throw the job his way, provided he would make it worth his while, to which the builder retorted that he would not give him five cents, and in less than ten days after two members of that Board of Education were arrested on a charge of receiving bribes in connection with the letting of the contract referred to.

A Nebraska City party calling himself architect and draftsman and advertising on his letter head "Plans and specifications a specialty," wrote to us as follows: "This city is about to build a school building of eight rooms to cost complete $18,000. I do not feel myself competent to undertake the work, and I ask you to make plans of same, or submit to the Board of Education through me a sketch for same. My work for the past seven years has all been opera houses and churches. (What kind of opera houses and churches must this man plan and build?) I call for aid from you as I want this work. Hoping to hear from you a favorable reply, etc."

We answered that on receipt of $50 we would send him two sets of sketch plans for such a building, and if he secured the work he was to pay to us $100 more for our services. In answer he replied: "Yours of the 18th inst. at hand. I am exceedingly busy; the school building may still be had. I ask you folks for plans. I only wanted elevations and floor plans. I would make the balance that I could annex my name for the work. I did not object to your prices, only I wanted less work than what you probably would have furnished me. I am all alone and cannot get help to do my work, and that was why I wrote to you. I won't take plans from everybody as I have my reputation at stake here and won't put bad work off on my patrons. I will make this offer: If you have a good plan costing $18,000, I am willing to give $100 in case I get the work, if not I only pay charges of carriage here and home."

We declined further negotiation with this charlatan and architectural disgrace, and told him that if he was as honest and sincere as he professed to be towards his patrons, he would go and frankly confess to the Board of Education that he was incapable of doing them justice in the matter, and recommend to them some one who was competent to serve them.

An architect in an Iowa town, with a heading on his letter paper as follows,

"Dealer in Building Material, Coal and Wood, Builders' Hardware. *Architect*. Building Plans, Specifications, Drawings, Blue Prints, etc. *County Surveyor*. Civil Engineering, Town Plotting, etc.,"

wrote to us, stating that he wanted to submit some plans for a twelve-room public school building for his town, to cost $30,000; want to arrange to submit plans in my own name, and arrange to get help in the way of a design from you. The Committee has a good deal of confidence in me, but while I have drawn plans for many dwellings, I have had no experience in other work, and cannot cope myself with the circumstances coming up. We quoted him $100 to be sent us for a set of sketches, but of course heard from him no more, as he wanted us to work on the no-cure no-pay basis.

A West Virginia contractor writes: "If you have plans for a $25,000 to $35,000 building, I would present them to the Committee and act for you. I am personally acquainted with all the Committee, and have the inside track on any other person or persons whatsoever."

A firm of builders in Jerseyville, Ill., asked us to send them sketches of a $40,000 building, and we sent two sets. They stated that they knew every member of the Committee, and anything they presented would be adopted; but this was not so, as some one else had more pull than they.

Fairbury, Nebraska, was about to erect a $50,000 building, and the leading newspaper man, whose house we had planned a few years before, sent us particulars, as also did a local architect, who stated to us he would explain our plans to the Committee, as he would like to superintend the building, etc. An Omaha architect, however, got the job by buying up the majority of the Committee at $400 a-piece, but the plan adopted was so very bad corruption was evident;—and the architect and the members of the Committee who had favored his plan were arrested and fined.

We made a resolution at this time never to enter another competition.

We have lost a great many plans sent down to Texas and some other Western States, and we know a Texas architect got hold of a side elevation and perspective drawing of a set of plans we made, and he has the same hanging on the the walls of his office with his name attached to them.

A well known Nebraska architect, who was a builder a few years ago, at which time he got from us several sets of plans for colleges and schools, that, he said, he would submit, but we never got any of them back again, and we presume he got enough plans in this way to start an architect's shop, which he now runs.

A Connecticut city of 10,000 inhabitants situated less than twenty-five miles east from New Haven, being about to erect a public building and having a Committee of sixteen members to procure plans, sent for us and voted that we be and are hereby employed to prepare sketches for same, at an expense not exceeding $200 for same. The Secretary of the Committee, a man of no ability or standing, who kept a flour and feed store, made no note of the proceedings, but trusted to his memory, and when we had made our sketches he disputed the matter as to amount of work we were to perform and also the amount of money agreed on, stating it was $50 we were to receive for sketches and not $200, and we finally, rather than have any fight over the matter, made our bill $50, but up to this time, over eight months after we performed our part, the Committee has not paid us. The Chairman of this Committee spelt patience, *patients*, and were, *ware*, and the Secretary spelt site, *sight*, and while we were making the sketches, so many architects had written the Committee asking the privilege of submitting sketches free of expense if not adopted, that they allowed it to take on the form of a competition, and allowed six of these architects to compete, and a Boston architect was selected, his fees to be five per cent. on the cost of the building, but when he came on to meet the Committee in response to a telegram from them, he writes us that he found, much to his surprise, the words to the approval and satisfaction of the Committee were interpreted by the Committee as including matters of taste, construction and cost to such an extent as to preclude the possibility of sound professional judgment, and no progress was made, and three months later the Secretary of the Committee came to Boston to meet him, and, as any proper understanding seemed impossible, therefore the architect felt it best to close the matter, which he did, the Secretary paying him out of his own pocket to settle it, as the Secretary favored the employment of a firm of builders—and soon after the Committee employed from the capitol city of Connecticut a firm of builders (who keep a draftsman) to carry out their ideas, make plans, etc. The idea of these ignorant politicians who cannot write a decent letter or spell the simplest words correctly, attempting to advise their architect on matters of architectural style and construction of a $90,000 public building.

This architect in Boston, who had designed and constructed some of the most notable public buildings in New England, a month later on account of business troubles, closed his earthly career, sending a bullet crashing through his brain; thus the difficulties that seemed to him unbearable might to others seem trivial and endurable evils, but he thought otherwise, and it is pitiful to contemplate the agony of mind which a man has had, for who knows how long to struggle against, before he is brought at last to cast aside voluntarily the boon of life, which, to his fellows, seems so priceless.

The Secretary of the last named Committee was also Chairman of a Committee which had charge of the erection of a $50,000 Y. M. C. A. building in the same city, and when we visited his city to get instructions *in re* the public building he asked us to examine the ground on which the Y. M. C. A. was to build, and we did so, and at his request made two sketches showing alternate designs of street fronts for a good architectural structure. A few weeks later he wrote that he had lost the sketches and asked for duplicates which we made and forwarded to him, but this man was so much of 'a jay and so ignorant that he did not know enough to say thank you, but he was unscrupulous enough to throw this work also into the hands of these same builders who advertise themselves as Architects and Builders, and later their front elevation was published in a Connecticut real estate and building journal, and their design was an unarchitectural medley, in fact a jumble in carpenterology, but they secured these jobs through the pull of a relative or friend who was a power and is connected with one of the banking institutions of the city and a Y. M. C. A. man also.

The New York *Commercial Advertiser* says that "the National Government buildings should be designed by various architects and not all under the supervising architect of the Treasury Department, that by assigning one structure to one architect it is thought that the grandeur of European public buildings may be approached"; and it timidly adds, as if to try to justify so extravagant an assertion, that "the excellence of American architecture on private and State buildings attests the presence of genius and merit."

So far as the State buildings or other public buildings of the U. S., outside of the supervising architect's office are concerned, it is a very rare case for one of them to be intrusted to an architect of ability, and it is manifestly absurd to judge of what the best American architects can do in the way of public buildings by the achievements of the people who find favor in the eyes of the politicians composing the committees who usually select designs or their authors to do the public work, but if European methods were adopted in treating with architects here, the best work of the best architects would be secured, and not only "the grandeur of European public buildings be approached," but within the necessary limits of size it would soon be far surpassed, but the N. Y. *Commercial Advertiser* should bear in mind that the ignorant pot-house alien politician and committeeman of the U. S. would not be allowed to rule, much less to have a voice in such public affairs in European countries, and more 's the pity that we are not similarly constituted and dealt with in this country as they are on the other side, but who is to blame?

We will give here a few of the many hundred competitions and methods employed by school committees to secure plans for their buildings that have come under our notice, which, we trust, will prove of value to others so that they will not fall into like mistakes, and if it appears that your Board must have a competition and advertise for plans, then do so in the best and most honorable and businesslike manner, and call in an expert to decide which is the best plan submitted, and we commend to your favorable notice the terms of the competition issued by the Board of Education of Cleveland, Ohio, printed on page 6 of this work, which is a model of its kind.

A great many people have doubtless heard of the Worcester, Mass., High School competition, which was for a building to cost $150,000, and how the Committee called on a firm of young architects in their city, and asked them if they would accept their terms of compensation for the work, which they had made very low, and that they stated four different architects established some time and of reputation in Worcester had offered to, or stood ready, to take the job at. These credulous and hopeful young men of course accepted the offer, but afterwards discovered on investigation that the reputable architects the Committee referred to had made no such offer, and would not take the work at the terms named by the Committee.

Another city in Massachusetts had a competition, which they advertised well, inviting architects to submit sealed, under motto, plans for a twelve-room schoolhouse to cost $40,000, and in response to same some fifteen sets of plans came in from various parts of the United States, and a Committee of three, consisting of Chairman of School Board, an old builder and an Alderman who had been principal of a school, were appointed to make a selection, and they at the start set aside four as being the best, three of which were submitted by their own city architects and another by an architect in an adjoining city in Massachusetts; thus, at the outset, it was simmered down to a fight for local talent, and was finally awarded to a firm of architects in their city, alleging all the time that they did not know by whom they were presented, which, of course, was not true, as all the local architects and their friends had done all the possible wire-pulling to influence and let the Committee know which was their favorites' plan, if they did not actually bribe or promise some one of their number compensation in case he got their plan adopted. Moral: Never enter an architectural competition unless the terms are right and proper, and you can be on the ground to guard your interests, and you know that the person who is to decide it is both capable and honest. Lastly: Be paid for your time and knowledge, or else do not enter the lists.

An architect in a certain town in New York State, whose plans the Board committed themselves to or partly adopted before the plans from ourselves and other architects had reached them for consideration, through an error in not properly fixing the date when they were to be received, for a $25,000 high school; but on comparison the Board discovered they had made a mistake, that their architect knew nothing about such a building, and that the matter of ventilation had not been properly studied, and the Board asked him to give it up, but he refused to do so, claiming it would be hundreds of dollars damage to him by way of reputation, etc. Then they tried to buy him off and to compromise with him, making him superintendent of the carrying out of the building after our plans and specifications, which they were anxious to use; but it was no use, he was determined to carry the thing through as employed or sue the Board of Education for breach of contract, and the Board finally gave in. Several letters passed between us and the Board during the controversy, in which they stated that they liked our system of ventilation, and that it was the most knotty question they had to contend with after the one of cost of building; that there were three physicians on the Board, that their architect showed two foul-air shafts in his plans, but the Board were satisfied that he was not competent to write specifications for the warming and ventilating, and that he did not know how to use the foul-air ducts he had provided, and that they had an elephant on their hands which they must make the best of.

A carpenter and builder in a Delaware town, writing us, says: "What I want is to select a building from your book, and get you to draw the plans and specifications. I am one of the School Board myself; there are two of us contractors in the Board, and each is to furnish a plan, and the most desired plan is to be built I herewith inclose you one dollar more for the book as above described, you will please send it by return mail, if possible; the Board meets Monday evening next, and to-day is Thursday, and it will reach me Monday, if you will be kind enough to start it by first mail. You will confer a great favor by getting me the book here by Monday, please do not disappoint me."

A shoemaker in a village situated in western New York wrote stating that he was in the School Board, and that they were about erecting a new schoolhouse, for which he had made drawings, and wanted to know if we could furnish him a blank form of specifications that he could fill up for the same.

We received a letter from a party signing himself Architect and Builder, and located at Mankato, Minn.; the letter was badly written, and the spelling horrible. He desired us to send him a set of blank specifications suitable for a pressed-brick high-school building, slated roof, basement and two stories high, terra cotta trimmings, marble floor in hall, and Georgia pine for main floors, one library room to fit up for public library, gymnasium in basement with all fixtures, chemical room in basement with all fixtures necessary in this rooni, and also state how large the dark room is to be. He further says: "You know what belongs to a high-school building, heated by steam, and has the fan ventilator; it's a $40,000 building when complete, with all the latest improvements in it; also send me one of your Building and Bond Contracts to apply on the same building."

A Building Committee in a Texas town, comprising a lawyer, a Presbyterian minister and a lumber dealer, asked us to send them sketch-plans for a school building to cost $10,000, which we finally did after some correspondence, with the result that the same were returned, and a letter was received by us written by the lawyer. as follows: "The objections to your plan are that the ceilings are too low, and front entrance too low for its width, windows are too high up and should come nearer the floors, the roof-plan is too plain for elevation, and the plans of a Dallas architect have been selected. I return your plans, and the Committee are sorry that you had so much trouble for nothing."

Here was a critic who knew nothing about the matter, and later we were informed by a builder in the town that the plan the Committee selected could not be built for near the amount of money they had in hand, which proved that they had merely been carried away, as is often the case, by the prettiest picture regardless of the practical results.

A large city in Texas received plans in competition for a $50,000 building, and a gentleman in the city submitted a set of our plans that we prepared for same, which, however, were not adopted, as a favored architect-politician in the city secured the plum, and erected the building at a cost of $85,000. Our representative called at the office of the leading man on the Committee several times to get our plans back, but was each time met with excuses, and finally he got desperate and threatened a suit to recover when he was told to call back in half an hour, and he should receive the plans. He watched and followed a messenger to the office of the architect who was awarded the work, and the messenger brought down from the architect's office a roll of drawings, which same roll was handed to our representative a little later, when he called for plans as requested. The architect referred to is a member of, and stands high in the councils of an association of architects in his State, and a few months after this occurrence he had the cheek to write us a letter proposing an arrangement that we submit any competitive plans in his State through him, and dividing the profits.

In another instance in Texas we sent plans for approval, and they were never returned to us, neither could we get any satisfaction, although it was clear that the building was erected from our plans, neither could we get a lawyer to take up the case against the public, as every lawyer was expecting political favors at the hands of the people.

A firm of carpenters and builders informed us that their city was to build a fine new building to cost between $80,000 and $90,000, and that they would like to submit a plan, but did not have the requisite ability to draw the plans themselves, neither did any of the draftsmen or architects in their city, which contained about six architects' offices, and as we could not compete ourselves direct—the Committee being dead against any Northern architects—therefore we concluded arrangements with the firm of builders to prepare for them sketch-plans and specifications with which to enter the competition with about ten others, all local productions, or from an adjoining city. The plans prepared by us were promptly adopted by the Committee, and the builders who presented the same also secured the contract to erect the building, and in the main entrance a tablet was put up giving the names of the Committee, architect, etc., and the name of one of this firm of builders was engraved on the tablet as architect. Later it leaked out through a draftsman who had been in the firm's employ, but was now working in the office of an architect in the same place, that the plans and specifications for the building in question had been prepared by Palliser, Palliser & Co., and accordingly the architects in the city, who were very bitter about the whole matter, sent a communication to us, asking us to render the profession in their locality a service by coming out openly and giving the facts, as they stated that all the architects competing were satisfied in their own minds that the carpenter who claimed to be the architect, and whose name as such was cut on the tablet, could not do such a piece of work, as he had never been known to plan anything larger than $1,500 or $2,000 dwellings, and then in his own genuine style of carpenterology, but since the erection of the new building referred to, he had gained a prestige over all the architects in the locality, which they did not relish.

A Connecticut manufacturing town, about to erect a high school, appointed a Building Committee to take charge of procuring plans and an architect's services, and at the head of the Committee was a Universalist minister, who invited us to send in plans, which we did, the instructions being positive that no plan would be adopted that could not be built for $30,000, and we were sure ours could, but it was too plain, and a plan was adopted that cost $50,000, and an additional appropriation of $20,000 had to be made, the minister committing a clear breach of contract with all the architects who worked on the $30,000 basis, and they have a good case at law against the town and will recover payment for their plans. The architect whose plan was adopted was a young and inexperienced man, impractical, and the leading contractor of the town said it was a waste of material from beginning to end, and that nine-tenths of the architects waste their clients' money, through being impracticable and wasting material, and that he had erected a building that cost $47,000 which he could have built for $35,000, and made a better building under the plans and ideas of a mature and practical architect.

A city in this State, near to New York City, put up a $100,000 high school. A young architect did it, having a relative in the Board of Education, and it cost the city $40,000 in extras and a lawsuit with the contractor at completion.

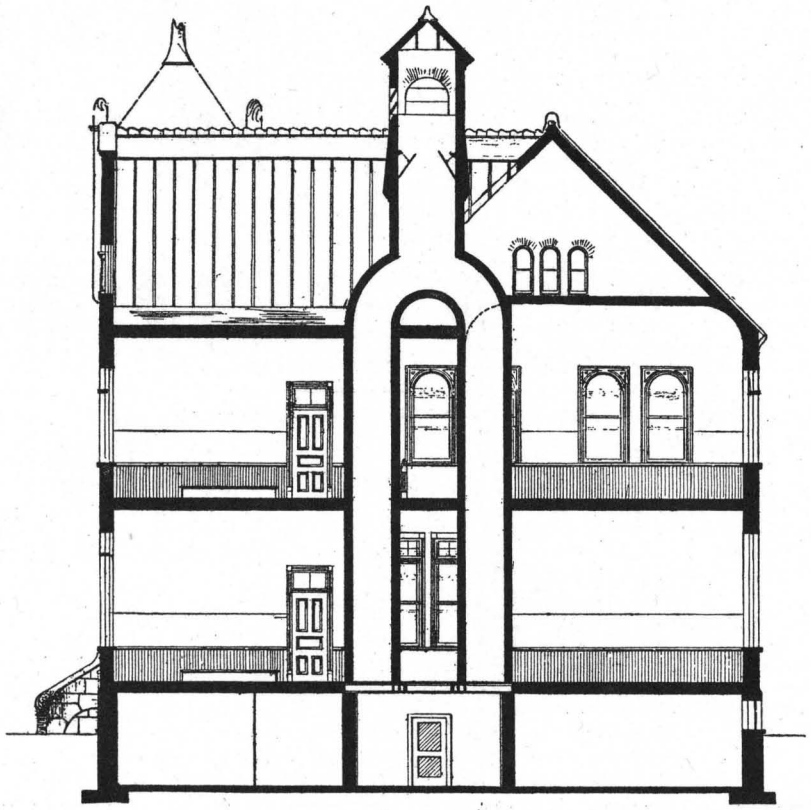
A School Board in Ontario, Canada, had a large building to put up and received a lot of competitive plans, and gave the award to the architect who exhibited the biggest and brightest chromo in the shortest space of time, but there is no prospect of their ever being able to build it, as their money is entirely too small.

In New Jersey they have not given very much attention to ventilation of their schools, and when plans were received for a $40,000 high school by a city in that State, an old Scotchman, a retired builder, was asked to look them over and select the best out of eight submitted, and he selected the plan that presented fine colored elevations and a specification that gave six lines to warming and ventilation while four or five plans were very much better and provided properly for warming and ventilation in the plans and arrangements of the building, and devoted ten or a dozen pages of specifications to same; but then the Board of Education made a mistake in the choice of their expert, and people who are not experts are just as liable to choose the bad as they are the good, and there are a great many architects who know nothing about the warming and ventilating of a schoolhouse and never will know, to say nothing of the very large number of so-called contractors and erectors of the apparatus, who actually know less about these subjects than the architects, but still they have a faculty for working the ignorant School Boards.

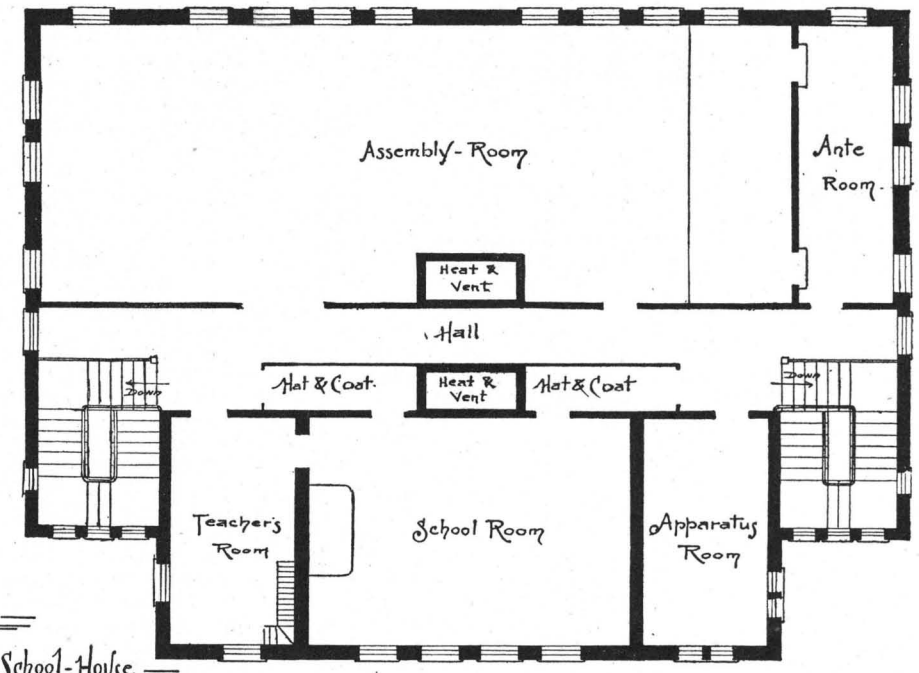
About a year ago we decided to stop shipping plans of schools all over the country at the request of Committees holding promiscuous competitions, and instead sent a price at which we would prepare sketches, and if adopted, also a price for preparing full working plans and specifications, etc., and from Chillicothe, Ill., in reply to our letter, we received the following

(*Concluded on page 110.*)

Design for a Model Brick School Building.



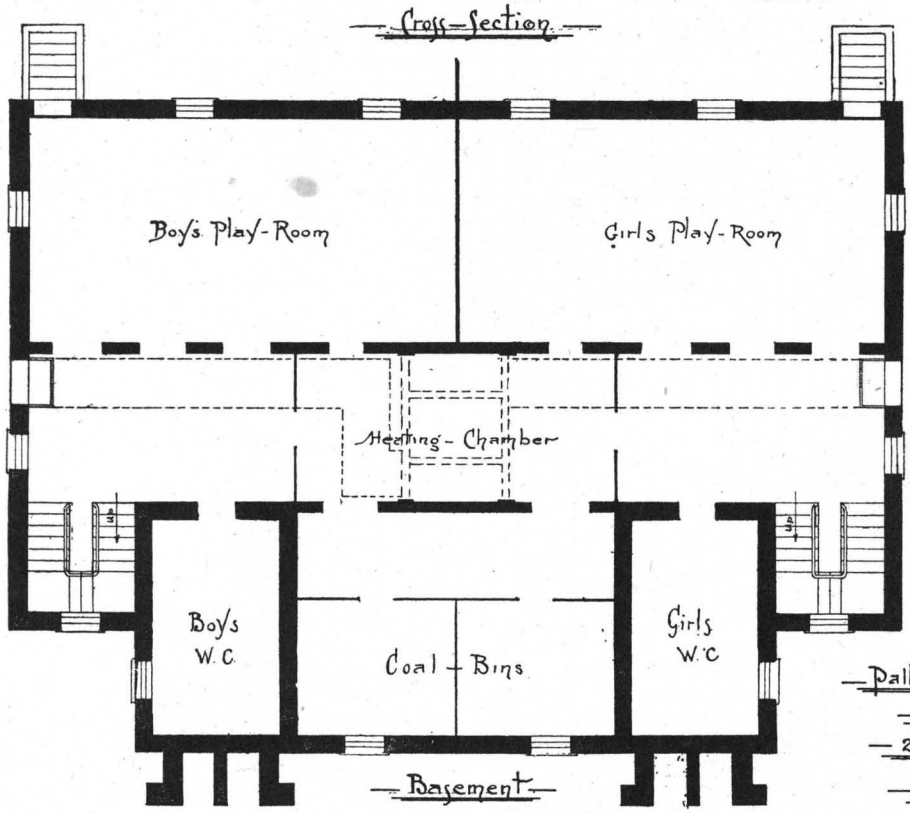
Cross-Section.



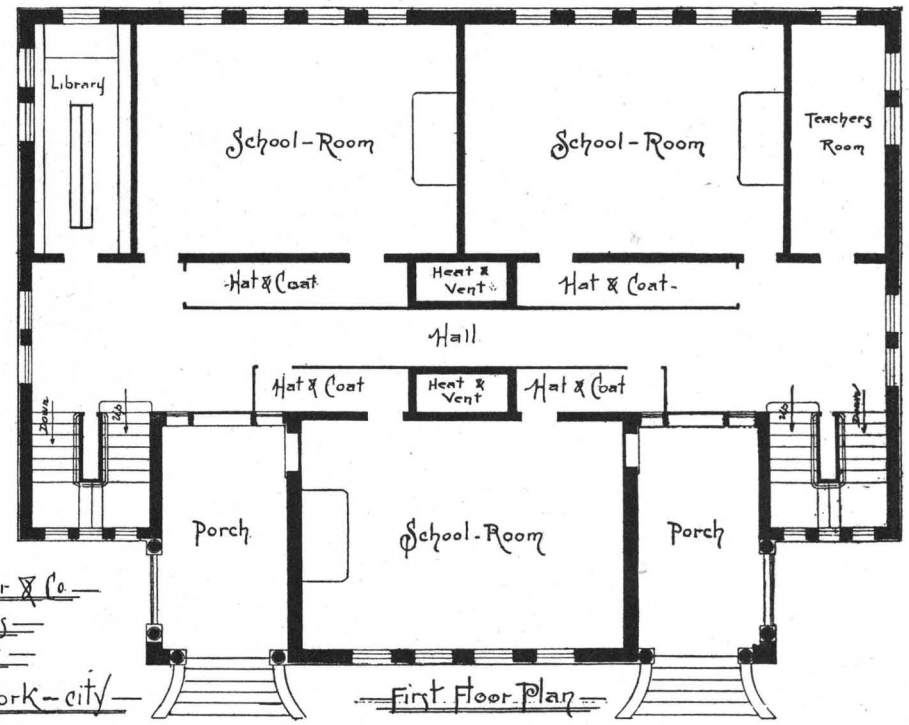
Second Floor Plan.

Design for $10000 School-House

Class 6



Basement.



First Floor Plan.

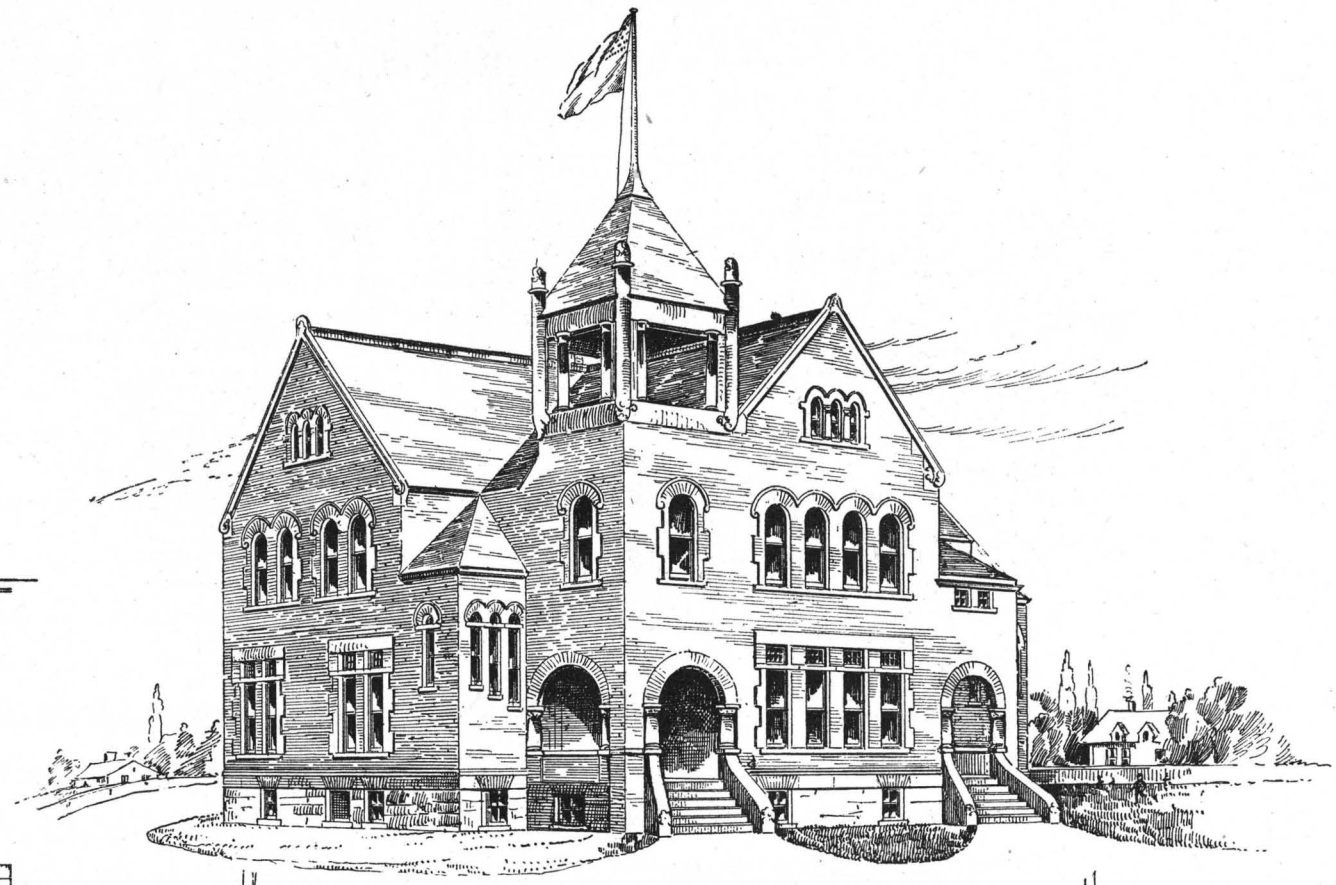
Palliser, Palliser & Co.
Architects
24 E-42nd St
New York-city

Design for a Model Brick School Building.

PLATE 39.

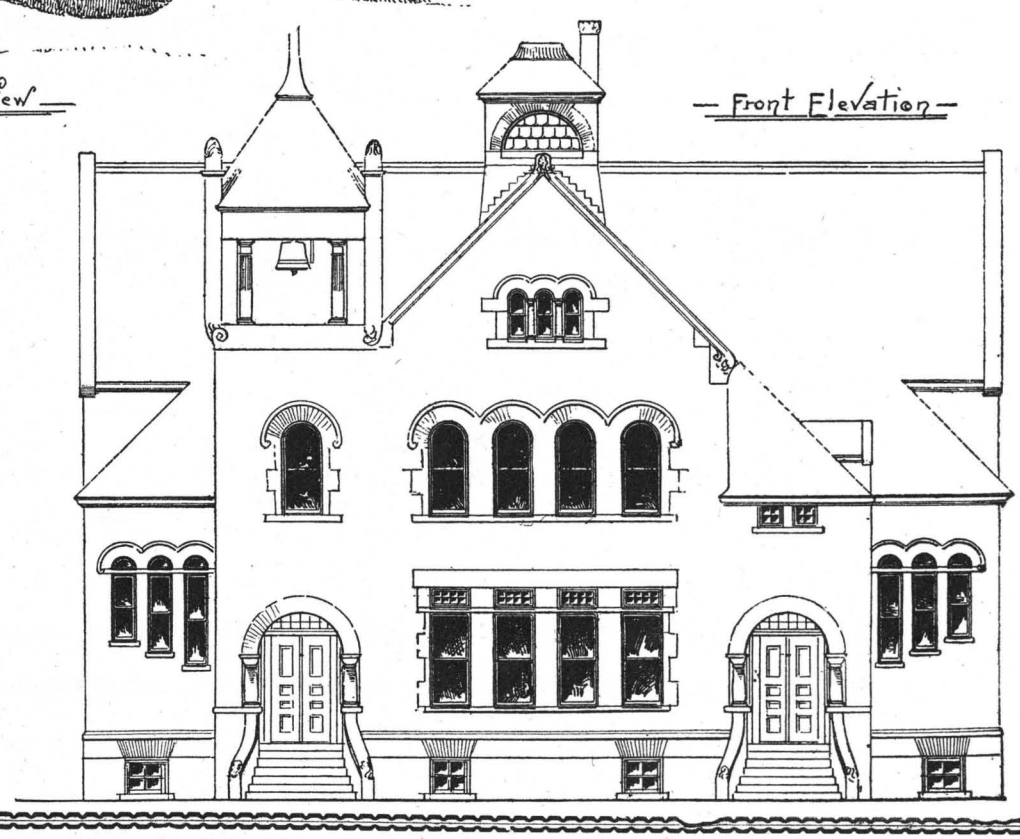
—Design:—
—for $10,000 School-House—
—Class 6—

—Palliser, Palliser & Co.—
—Architects—
—24 & 42nd St—
—New York—city—

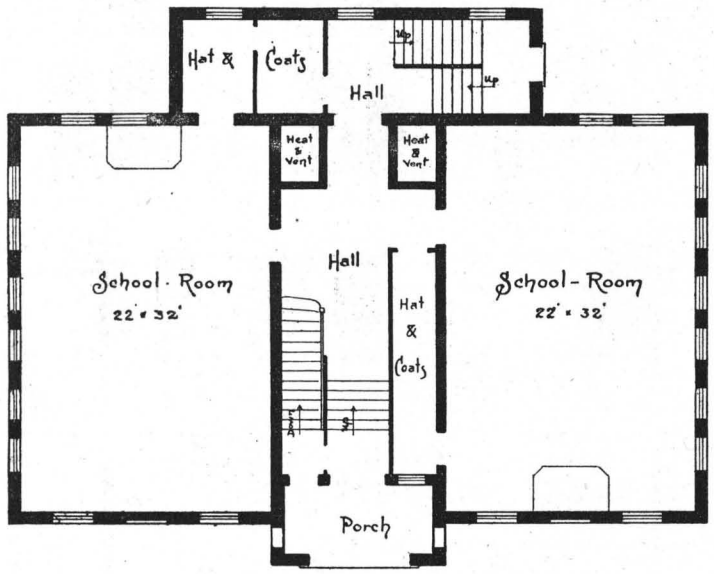


—Perspective View—

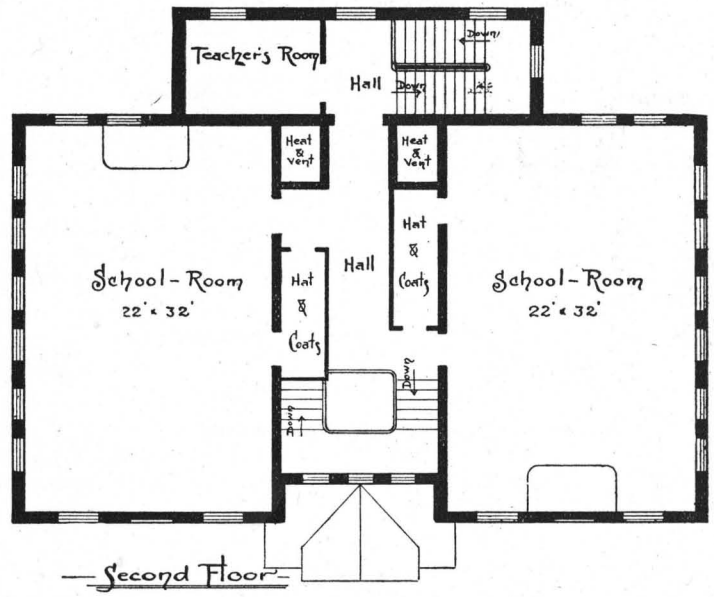
—Side Elevation—



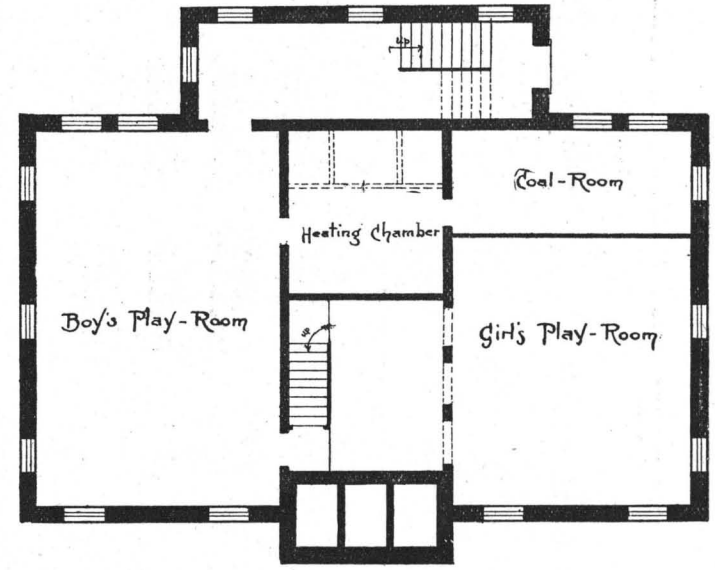
—Front Elevation—



First Floor



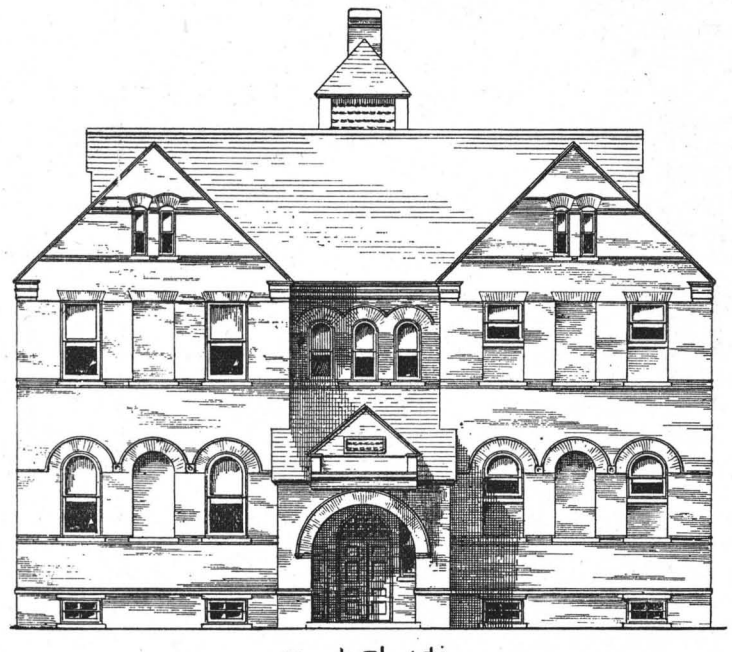
Second Floor



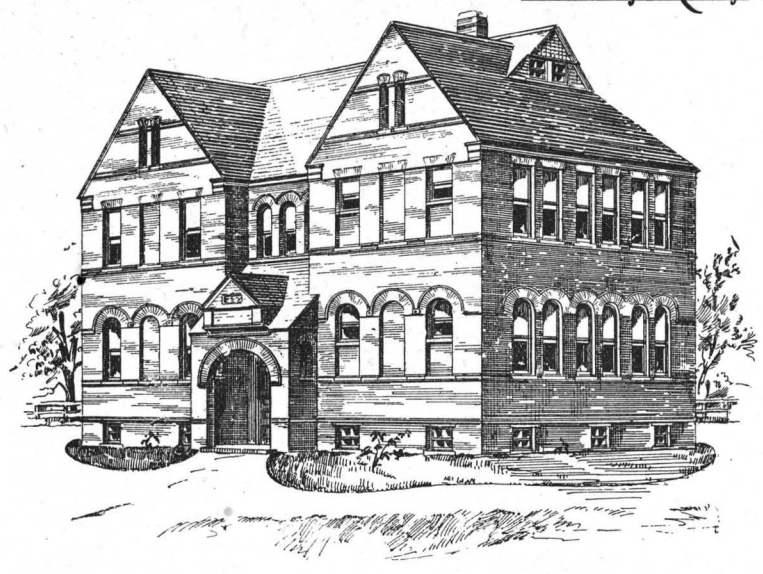
Basement

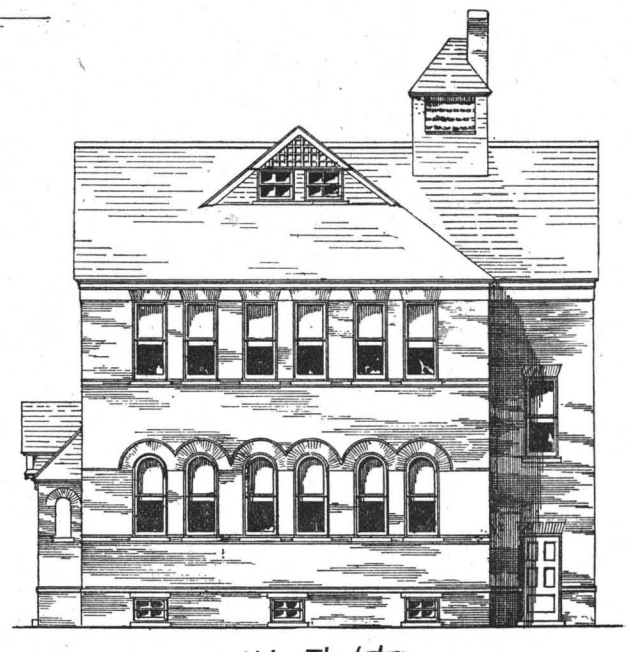
Design
for $7,500 School-House

Palliser, Palliser & Co.
Architects
24 E. 42 St
New York city

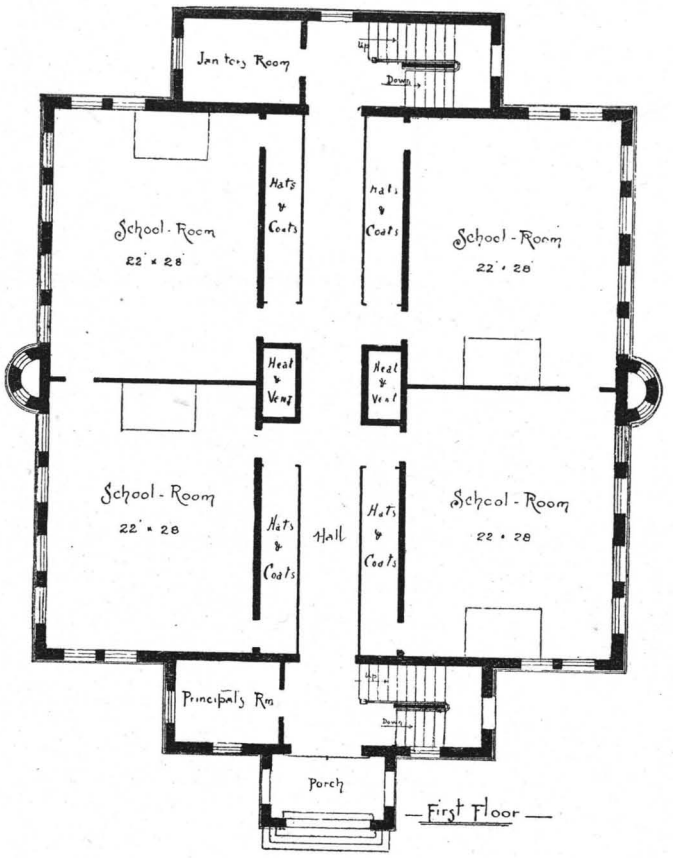


Front Elevation

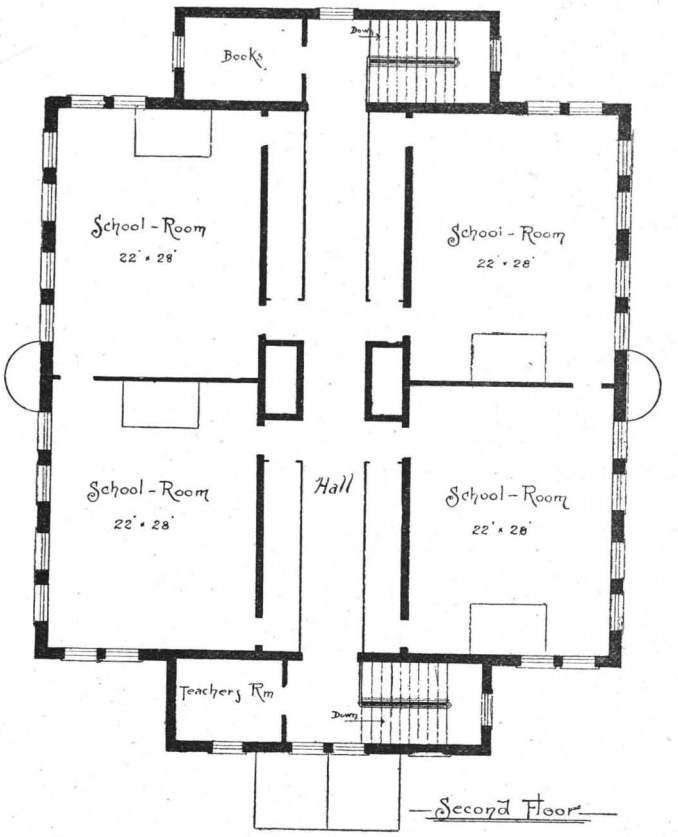




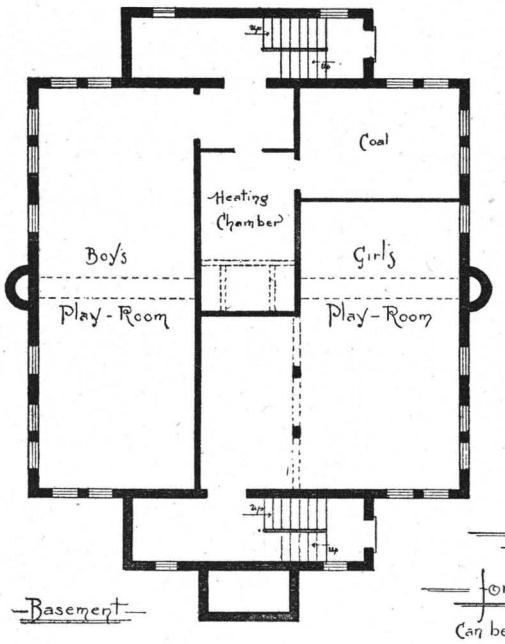
Side Elevation



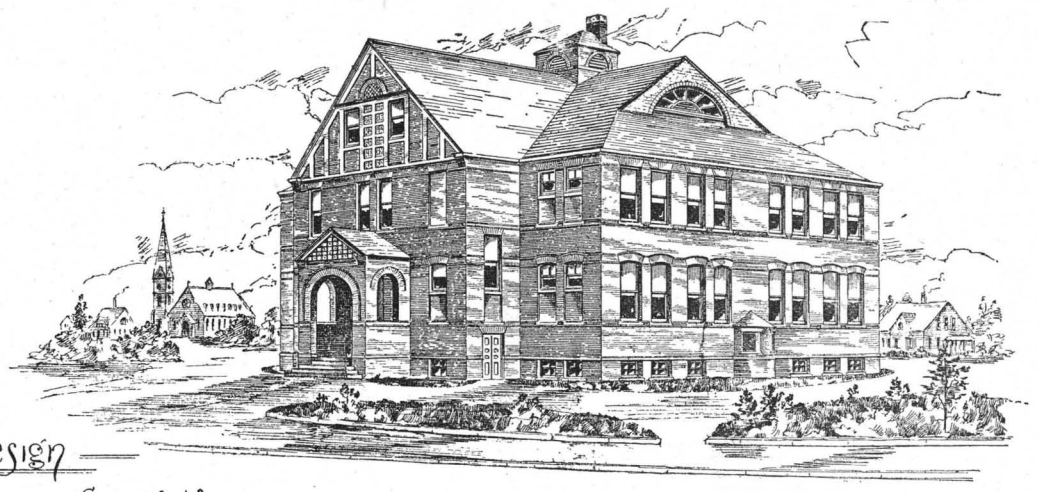
—First Floor—



—Second Floor—



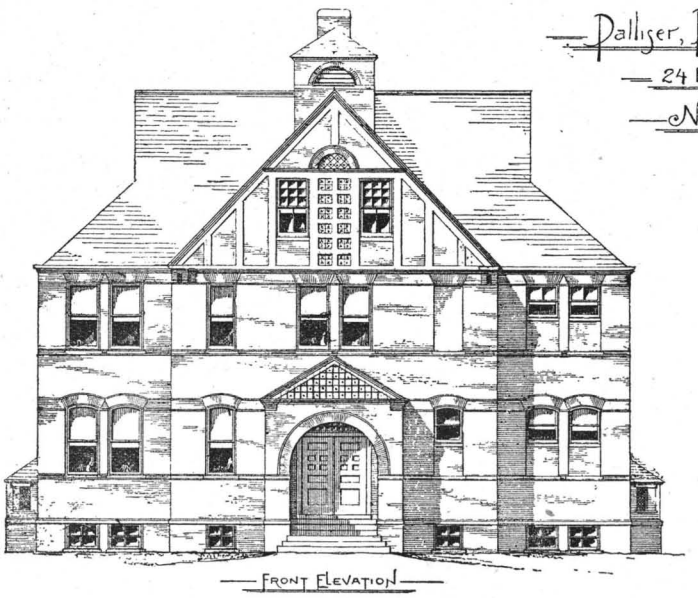
—Basement—



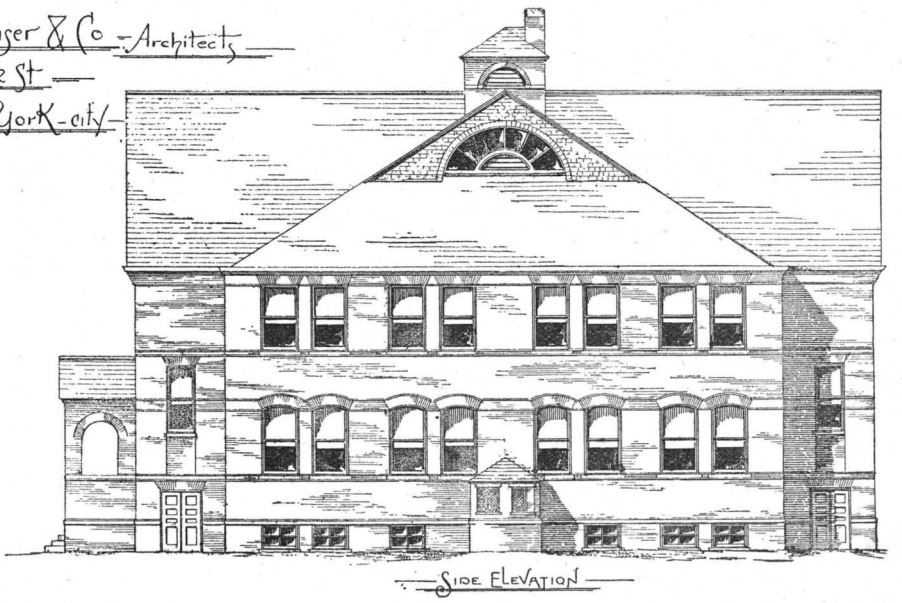
—Design—
—for $ 15,000 School-House—

Can be built in some localities as low as $ 10,000

—Palliser, Palliser & Co. Architects—
—24 E. 42 St—
—New York City—



—Front Elevation—



—Side Elevation—

The Selection of Plans and Erection of the State Normal School at New Britain, Conn.

In the erection of her State Normal School at New Britain, Connecticut had a building experience very much to her discredit. One hundred thousand dollars was appropriated for the purchase of a suitable site,—for the erection of the building, and for all expenses connected with the carrying out of the same ready for occupation. A committee of three was appointed by the Governor to carry the work to completion, subject to the approval of the State Board of Education, and we received the following from one of the Committee who acted as clerk:

"I have to inform you that the time for presenting plans, etc., for the State Normal School Building has been extended to August 15th. Please forward such plans as you wish to present so that they may be received by that time, direct to The Secretary of State, Hartford, Conn., and mark the package on the outside 'Normal School Plans,' sign the plans with some fictitious designation, but enclose in the package a sealed envelope containing both your true and fictitious name. Bear in mind that no plans can be accepted that cannot be carried out for $70,000, exclusive of site, warming and ventilating apparatus, and furniture. Please have your plans on hand at the time and in the manner specified, and notify me by mail when you have so forwarded them."

Six architects submitted plans on August 15th, 1881, in response to invitations; ours bore the motto "Practicus," and a guaranteed estimate of cost or tender to carry our plans into execution for $70,000 by a leading firm of New England contractors were also submitted with them. Our plans were considered the best by all who saw them in the rooms of the State Board of Education in the Capitol Building at Hartford, Conn., and they, with the productions of two other architects, were set aside by the Committee for further consideration.

Three days later a communication was sent us by one of the Committee, the Hon. Chas. Benedict, of Waterbury, Conn., whose word was never questioned, and if there ever was a man in Connecticut the soul of honor, verily it was this man. He said: "There are influences at work for Architect B——, which are of weight with some of our Committee. Mr. L—— thinks anything Mr. W—— strongly recommends must be about the thing. Your plans and his are very much alike in many particulars. I prefer yours, if it can be built for the same money. Your elevation is better, though his is good."

As the clerk of the Committee in his instructions to architects as to cost had only figured to retain out of the appropriation some $3,000 for warming and ventilation, which was, as we informed the Committee, entirely inadequate, and should be doubled, then the Committee asked us and some others to sketch a modified plan so that the same could be executed for $73,000, including the warming and ventilating.

The plans sent in by the architect in whose behalf there was a pull, had them returned to his office—none of the other architects' plans were at this time returned to them—and on August 19th Mr. S—— of the Committee and the President of the State Board of Education visited the architect referred to in his office, and talked over his plans with him. Mr. W——, the power behind the throne, being also consulted.

The 31st of August was fixed as the date for the final presentation of plans and selection on the part of the Committee and State Board of Education. Our modified plans were submitted on that day together with a proposal from the firm of builders to erect the same and complete it in a year's time, for the sum of $73,000. This all seemed to us to be trickery on the part of the clerk of the Committee to gain time so as to get all hands to favor the plans of the architect with the pull, and Mr. B—— of the Committee got so disgusted with the whole matter that he did not meet with the other two members, Mr. L—— and Mr. S—— of the Committee, but left the matter with them and the State Board to decide, which they did in favor of the architect with the influence, and on Sept. 9th, we received formal notification from Mr. S—— of the Committee who also acted as clerk; it was as follows: "The Committee on the construction of Normal School Building, after full and deliberate consultation, have decided that it is not for the best interests of the State to adopt the plans submitted by your firm; while containing many admirable features they are not considered the best." The plans were accepted conditionally on their being carried into execution by the architect for the sum of $73,000.

Soon after—and just on the eve of his departure for Europe, which proved his last business trip, as he died on board steamship on the return voyage—Mr. Benedict submitted to the two other members of the Committee the following:

"If the plans adopted figure up over the amount proposed to be expended, $73,000, so that it will be necessary to cut them down very much, then the architect should give it up and the Committee take next best plan.

"Architect should guarantee cost of building and his agreement should be to the effect that if he does not carry out the plan and design he has submitted for the money, then he should give it up and make no charge for services in the matter, also he should build and finish it in the best manner as per his original, general specifications or description—ceilings should be lathed with wire lath throughout in any case.

"Potter & Robertson, of New York, won competition for Trinity Church, St. Johns, N. B., to cost $60,000, when figured found to cost nearly double. Committee gave them up, took next plan which could be carried out for the money. Stratford, Ontario, High School Building Committee accepted finest and largest plan, but found it would cost just double the appropriation and had to give it up.

"Bridgeport, Conn., High School Committee adopted plans by same architect as plans just adopted for Normal School, and found would cost $83,000 in place of $55,000 as provided for it. Committee allowed plans to be cut down and building to be spoiled to enable him to build it; the plans he prepared for High School, that were figured at $83,000, were not nearly as expensive a building as the one he has now planned for Normal School, and with brick and labor and all material 15 per cent. higher now than then; the query is, how can he build a building now that it is much more extravagant for $10,000 less than then?

"There are lots of cases on record where architects have won competitions, and it has been found advisable to give them up when brought down to a practical test, and take the next best plan. The Messrs. Palliser have guaranteed their plan can be built and in the best manner, as per specifications, etc., within the appropriation, $73,000, and I think that it would be fair to all parties should it be found that the plan adopted is too expensive, that Messrs Pallisers have the next preference."

This was the last effort on the part of Mr. Chas. Benedict to have the best interests of the State served in this matter, but it proved futile, and at his death another was appointed on the Committee by the Governor in his place.

In due time the completed working drawings and specifications were placed before Contractors for obtaining estimates, and were for a few weeks the sport of the builders when the design and construction of the building and the dizzy guesses at the cost as compared with the appropriation furnished no end of hilarity, as in many cases these guesses were thrice the amount of the appropriation. A heavy Connecticut contractor who was also a prominent politician, travelled quite a distance to look over the plans only to inform the architect that there was no use his wasting any time estimating. When Mr. L—— the Chairman of the Committee met this builder later, he asked if he had figured the plans, when he replied; Certainly not, would only be a waste of time, as that building will cost $125,000 or $135,000. Mr. L—— retorted, You are mistaken; but when the estimates came in the lowest was $125,000, proving that this builder's opinion was a correct one.

At this time we addressed a letter to the Chairman of the Committee telling him that we stood ready to carry out our agreement as submitted Aug. 31st, and execute our design for the appropriation, but the architect chosen had a second estimating by builders after cutting down and modification of his plans, but that did not materially mend matters, for then the lowest bid was some $96,000. All this did not deter the Committee in finally accepting new plans by their architect, after cutting down, it is said, five times, and in their letting a contract for a building with a story and a half cut off, and in other ways reducing it so that the playrooms and other parts of the basement had to be given up to schoolrooms, and the Committee it is said, appointed as superintendent another political favorite at a liberal pay per day, to watch the builder and to see that the building was a success, but when completed it was far from it, and required later an expenditure on the part of the State of upwards of $40,000. The building was erected in 1882-3, and occupied in 1884 a waste of two years' time in its use; the first Winter about $1,200 was expended for changes in heating apparatus and experiments and changing of ventilation; more money was then expended in finishing up the attic to provide office of gymnasium. A gymnasium 63×33, a modeling room and a workshop 78×18, which are not the best of rooms, but as good as could be obtained in the roof, but still these expenditures did not supply the space required by the number of students, and in 1889 $25,000 was appropriated for enlarging and repairing the building in such a manner as will afford sufficient room for the needs of the Normal School.

The building erected in 1882-3 was planned for a school of 150 students, see illustrations on this page. Fig. 1, Perspective View; Fig. 2, Plan of Basement; Fig. 3, Plan of Ground Floor; Fig. 4, Plan of First Floor. The plans submitted by us are illustrated by plates 42 to 46, both inclusive, and was planned for 220 students, and also provided for all purposes of the building, together with the large assembly hall, etc., on the top floor which the building erected does not provide; and the State will never get what is wanted out of their building, no matter how much patching up or money they may expend on it.

Far more serious to the public than the waste of their money, consequent on its expenditure by a whole series of incompetent if not corrupt servants, is the question of whether or not they got in the end as sound and serviceable a building as was possible to be had, and which they could have got without trickery, jugglery and delay.

The Committee and State Board of Education have not yet to our knowledge publicly explained their gross mismanagement of this important matter by which the State lost so heavily, and it appears strange that the people and press of Connecticut have never taken the least interest in the matter, not even to the extent of securing an investigation into the action and methods of the honorable Commissioners appointed by the Governor.

The Committee or Commission were very particular in August, 1881, before adopting a plan to have the competing architects make new sketches to modify their buildings,—a paltry $3,000,—which could easily have been done by the successful architect, after his plan was selected, but this was evidently a ruse to gain time for the influence to do its work in behalf of the favored architect who was afterwards allowed to cut and carve his plans to his heart's content, so that he retained the job, as a mere matter of $50,000 was then as nothing to the Commission and State Board of Education, and, considering all these things and the circumstances, it looks exceedingly like as if our work was got from us under pretenses which, if not false, are exceedingly discreditable to the Commission, and, to say the least, we were surprised that some other competitor who was similarly juggled out of his time, talents and experience, did not ventilate this unprecedented conduct of the Connecticut State Normal School Commissioners, but they may have attempted it through the press and been refused as we were.

We should be glad to hear from our readers who have something to say on the legal points, with precedents of actions, as it is monstrous to think that redress cannot be got for such extraordinary conduct.

This chapter of blunders, coupled with the lack of judicial integrity on the part of this Commission and State Board of Education, who should have served the best interests of the whole people of Connecticut, will furnish the best of texts for the use of the profession of architecture on future occasions. Why, by the way, would it not be well for the architects of Connecticut, and surely it contains some reputable as well as capable practitioners, but if not, then the members of the Builders' Exchanges should take hold—and the builders are, as a class, in the State of Connecticut second to none—and appoint a standing committee to look after the matter of such public buildings, which are likely to go otherwise by default to any one who has influence and can bring into the field the greatest pull in his interest, or who can exhibit the biggest or most attractive chromo? The architects or builders might in this way save the public a good deal of money, and reduce the present percentage of failures, while they at the same time would bring themselves into a position to be better and more favorably known. The press will not do it; their backbone and their comprehension of the facts are very weak, as we have good reason to know, and they appear to be satisfied with "Wooden Nutmeg" methods. Perhaps it was that the Commissioners came to the conclusion that, because of the inability of their architect to erect the building with an assembly hall in the upper story and roof, that it was not practicable for the amount of money at their disposal; but if they did, this was done in face of the fact that we had guaranteed the cost and brought forward a firm of the best builders in New England ready to sign the contract on August 31, 1881, and deliver our building on that day a twelvemonth all complete and ready for occupation.

The Waterbury, Conn., *American*, of Sept. 1, 1883, contains the following item:

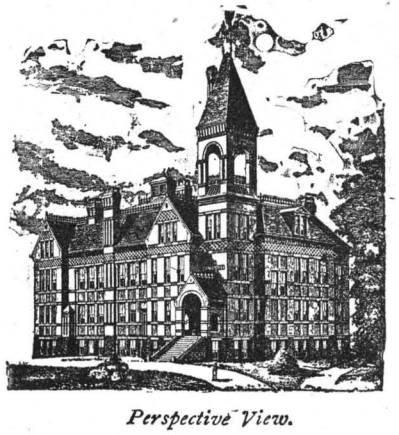
"We recently visited the new Normal School building which is in process of completion. The site is all that could be desired, but it seems to us that the building has been sacrificed to a false standard of economy. The original plans, which would have given the State a building to be proud of, and one that would have served for years, were cut down to fit the appropriation. There are only two stories, thus depriving the school of a much-needed hall. The faculty are left, as they always have been, dependent upon the generosity of the churches for a place to hold graduation exercises. The supply of light, in some of the rooms at least, is deficient. There is no place in the world where light is needed more than in the schoolroom, and we are surprised that the building was not normal in that particular. The building is not ready to occupy yet."

The above shows that the author of it was misinformed, and had not followed the matter up from the start, otherwise he would have known the game of the Commission which had charge of the erection of the building better, and would have given a very different account of it.

On the day following the dedication of the building, a Bridgeport, Conn., newspaper gave a long account of it, and among other things said:

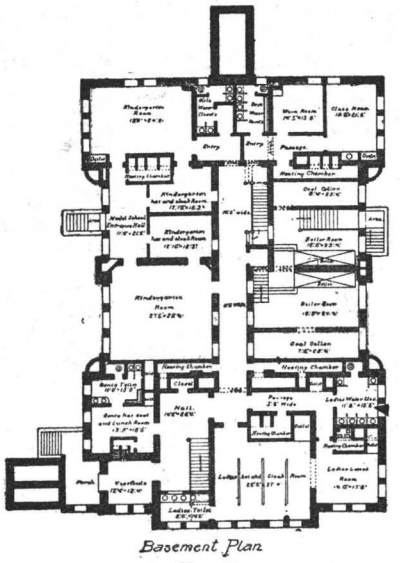
"Great credit is due the Commissioners who have spent much time with the work, and to the architect who has worked with them. The Rev. Storrs O. Seymour, of Hartford, in behalf of the State Board of Education, accepted the key of the building. He regretted the absence of the Governor, and thanked the Commission for their satisfactory performance of the duties entrusted to them. He said the people of Connecticut wished to provide all the educational advantages that may be necessary. This building was not erected to beautify New Britain, nor that New Britain people might take pride on account of it being there, nor even to spend money, but simply to have a suitable place to teach our coming school teachers."

The reader who has followed this whole matter can render his own verdict as to the truthfulness of the above. Comment on our part is unnecessary; but because there was no room in the building as required, the graduating exercises were held in the afternoon of the same day at the South Church, in order to afford the large number who wished to attend an opportunity to do so. Had the Commissioners and State Board of Education been true to their trust, these very exercises could have been held in the large hall of the State Normal School Building at New Britain, and also the exercises of the two preceding years to this dedicating of the building.



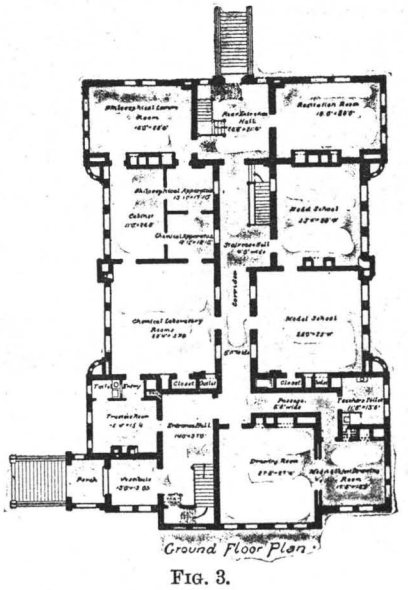
Perspective View.

FIG. 1.



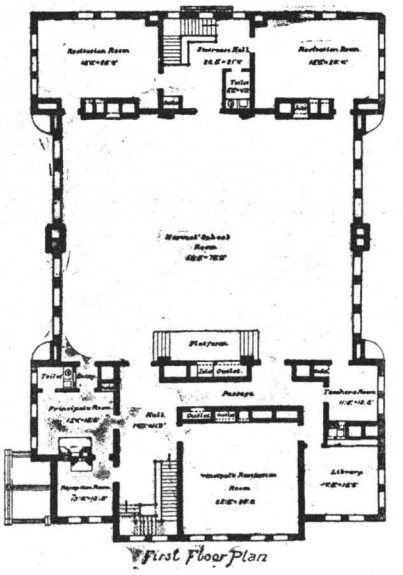
Basement Plan

FIG. 2.



Ground Floor Plan

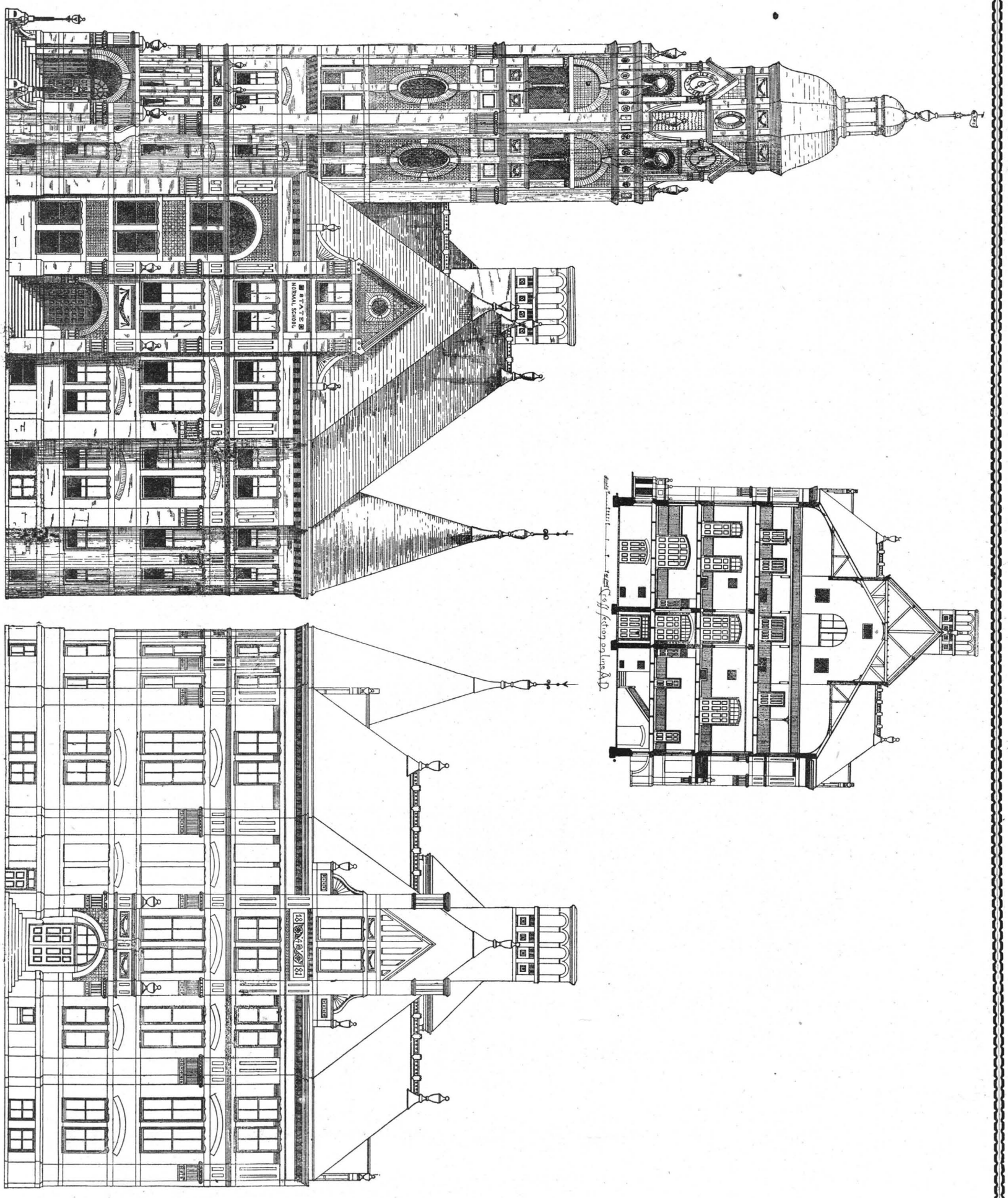
FIG. 3.

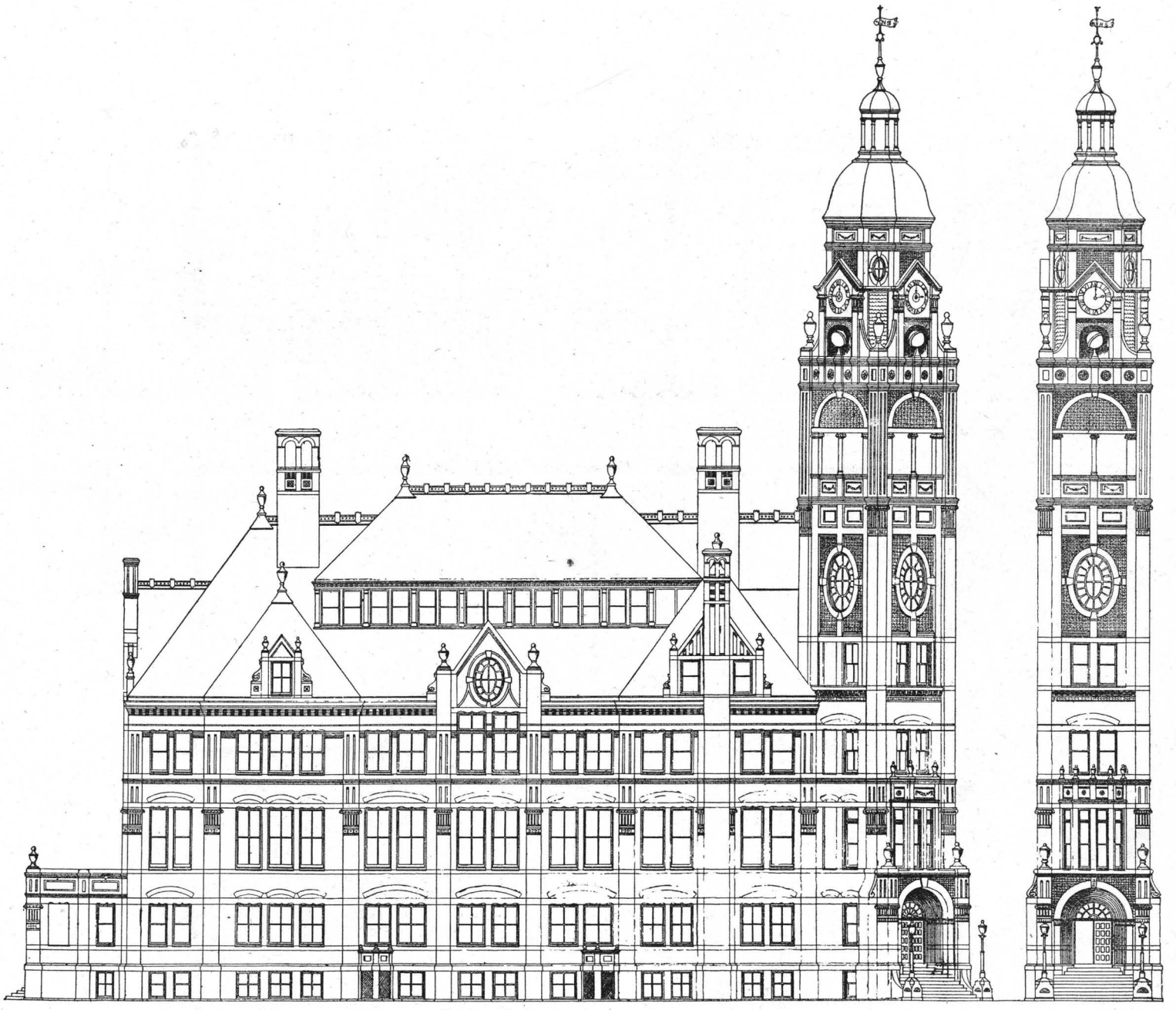


First Floor Plan

FIG. 4.

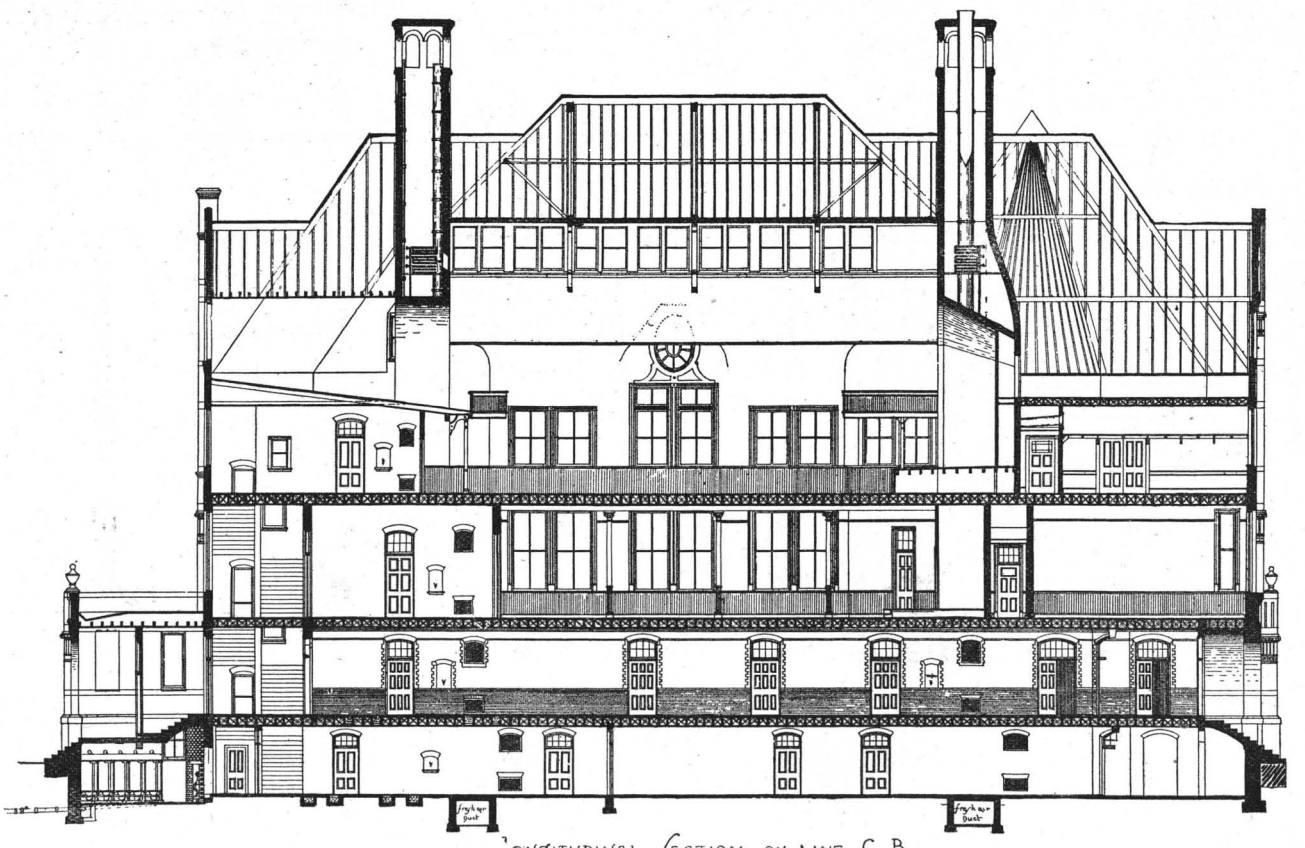
Perspective View



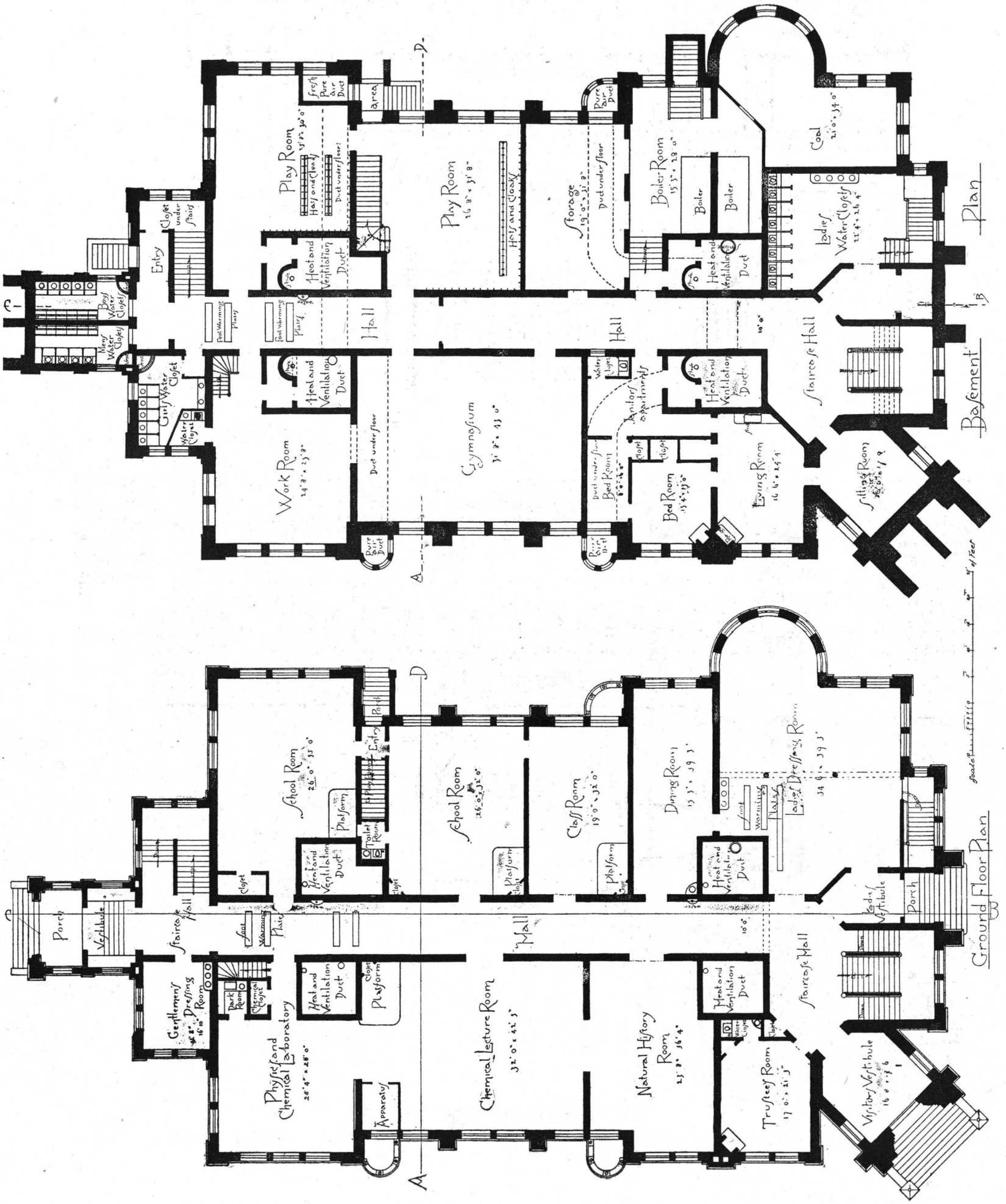


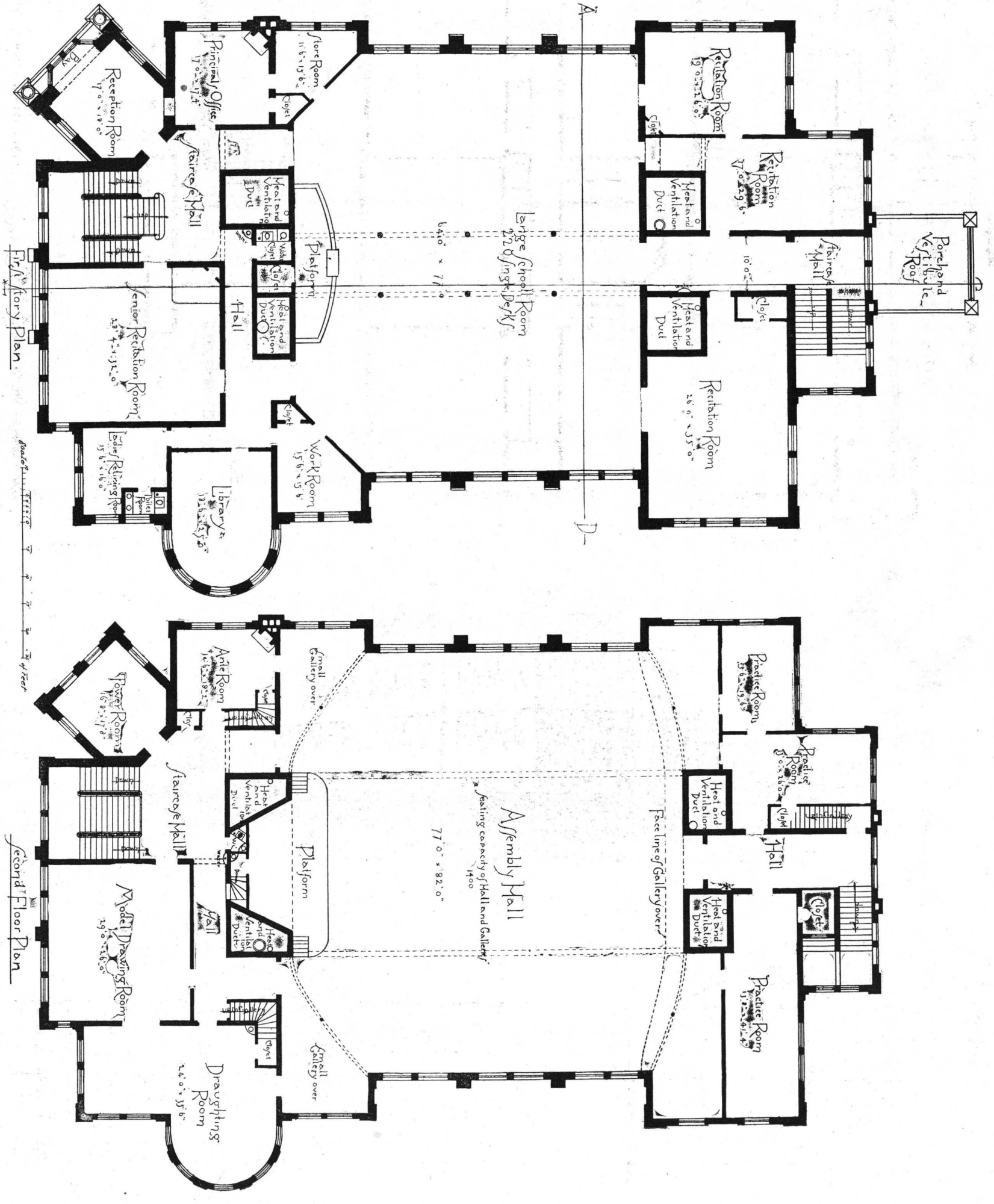
East Elevation

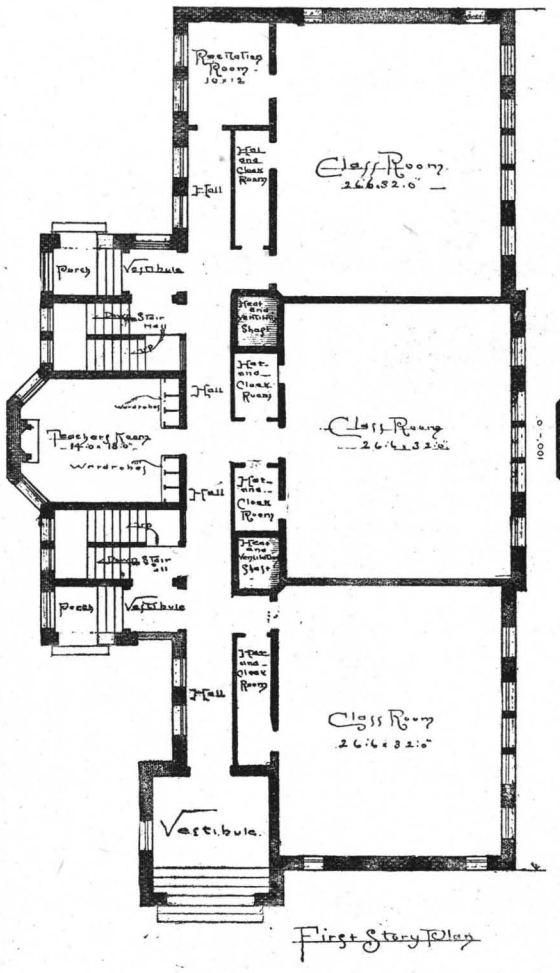
Front of Tower



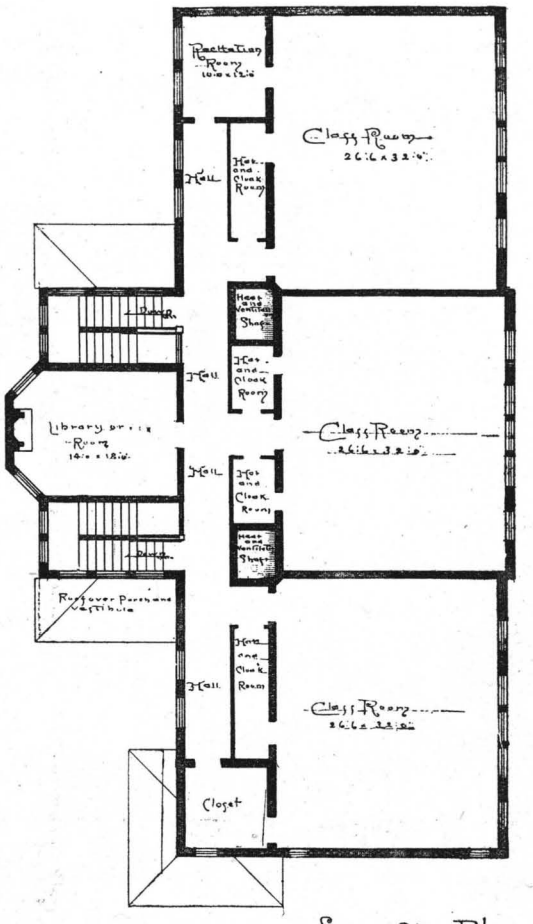
Longitudinal Section on Line C B



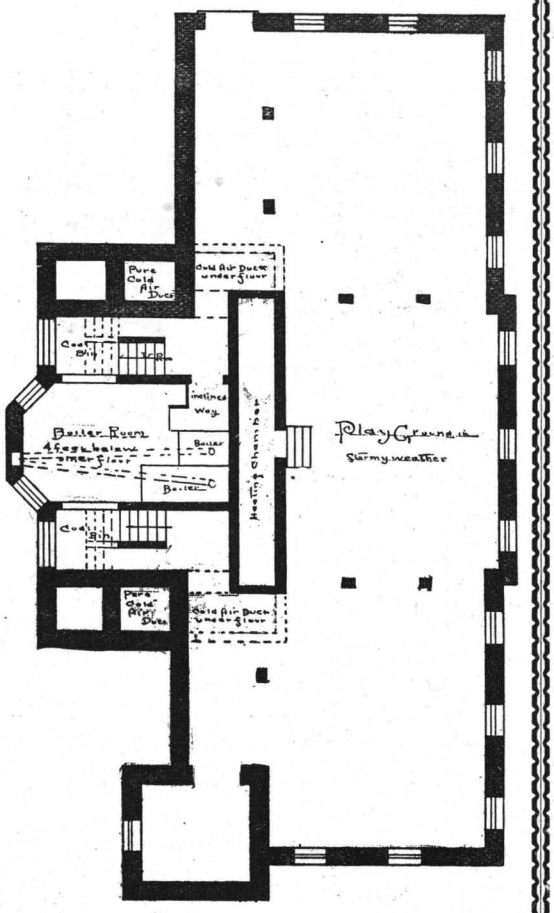




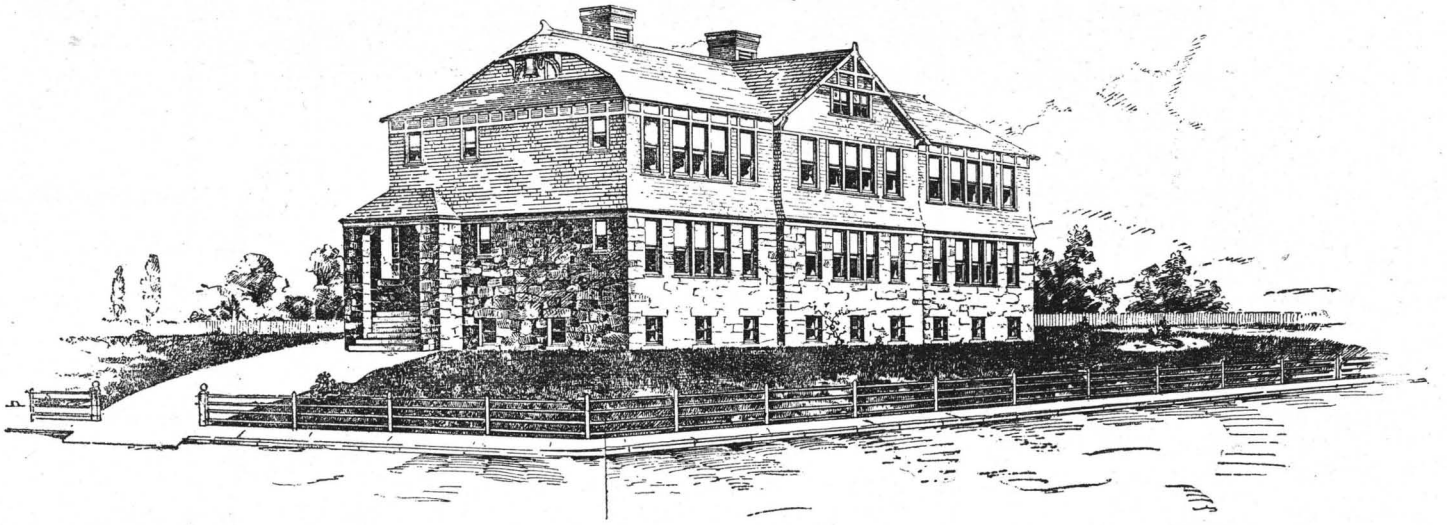
First Story Plan



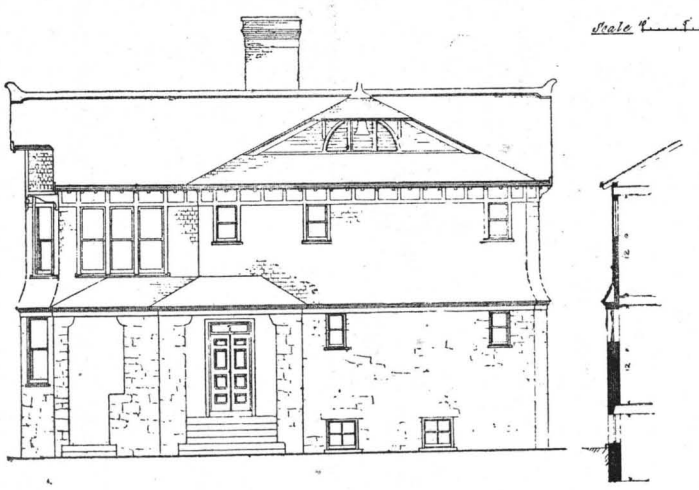
Second Story Plan

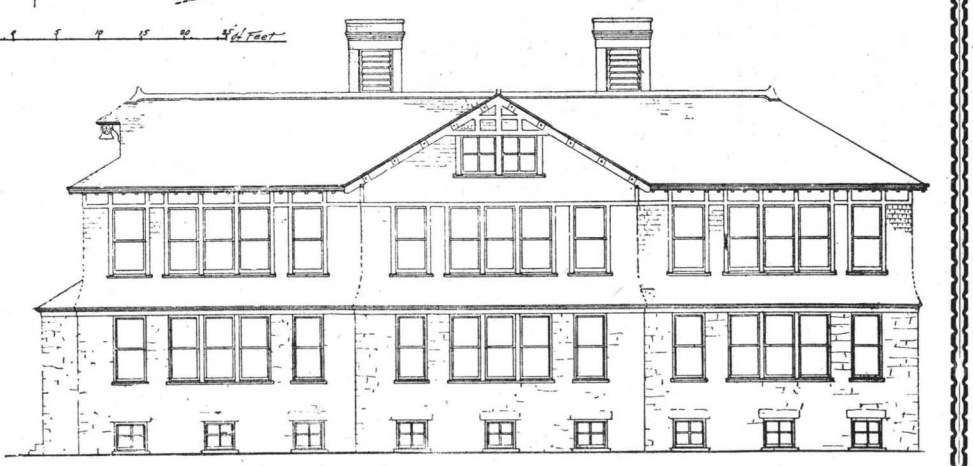


Basement

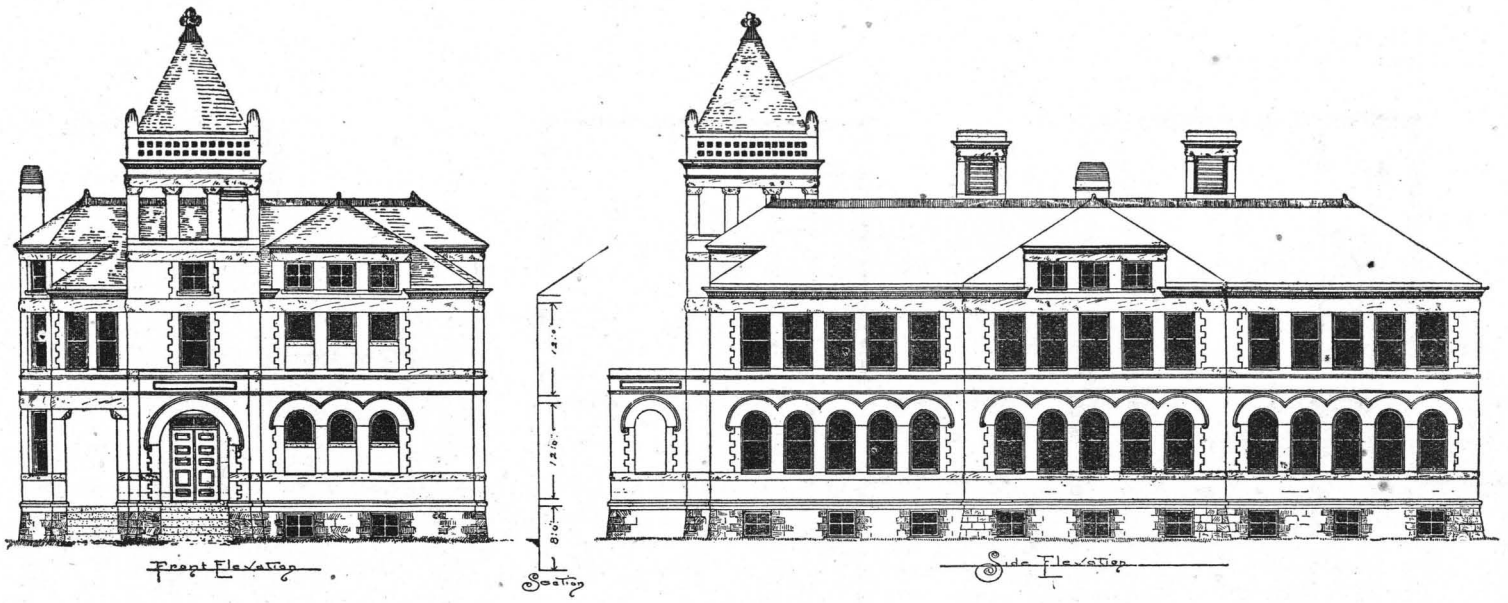


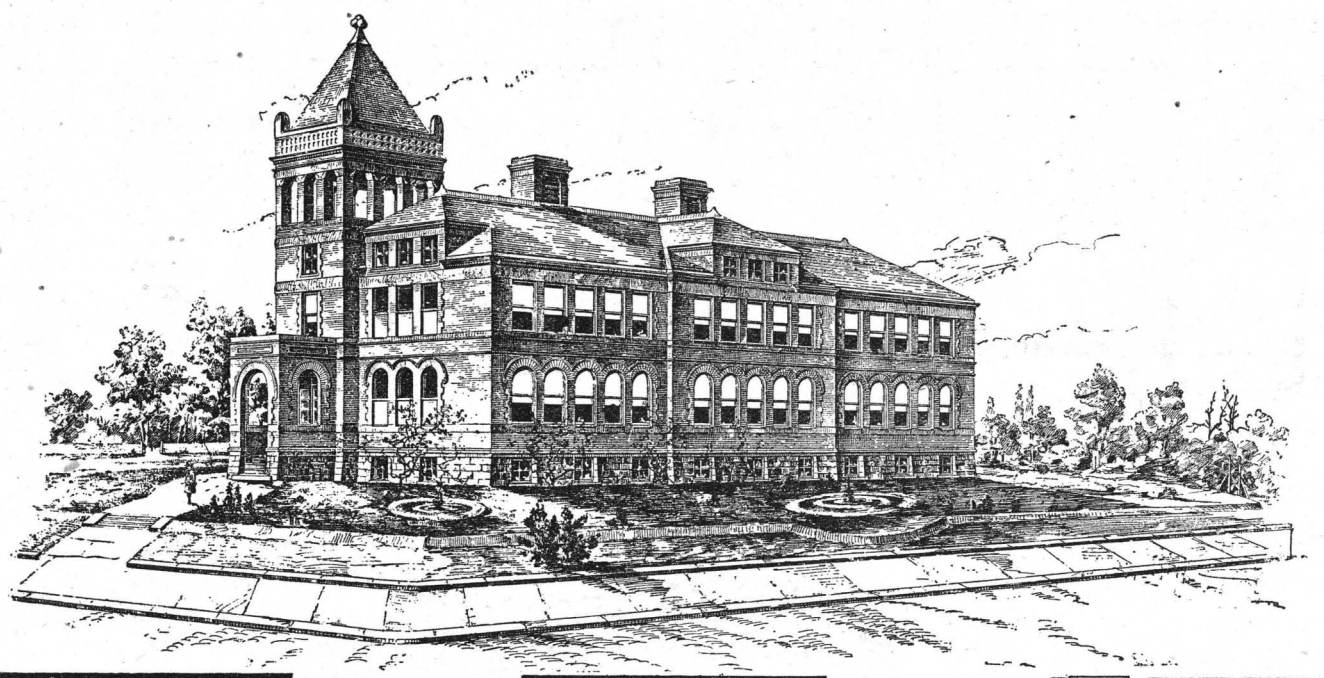
Scale 0 5 10 15 20 30 Feet

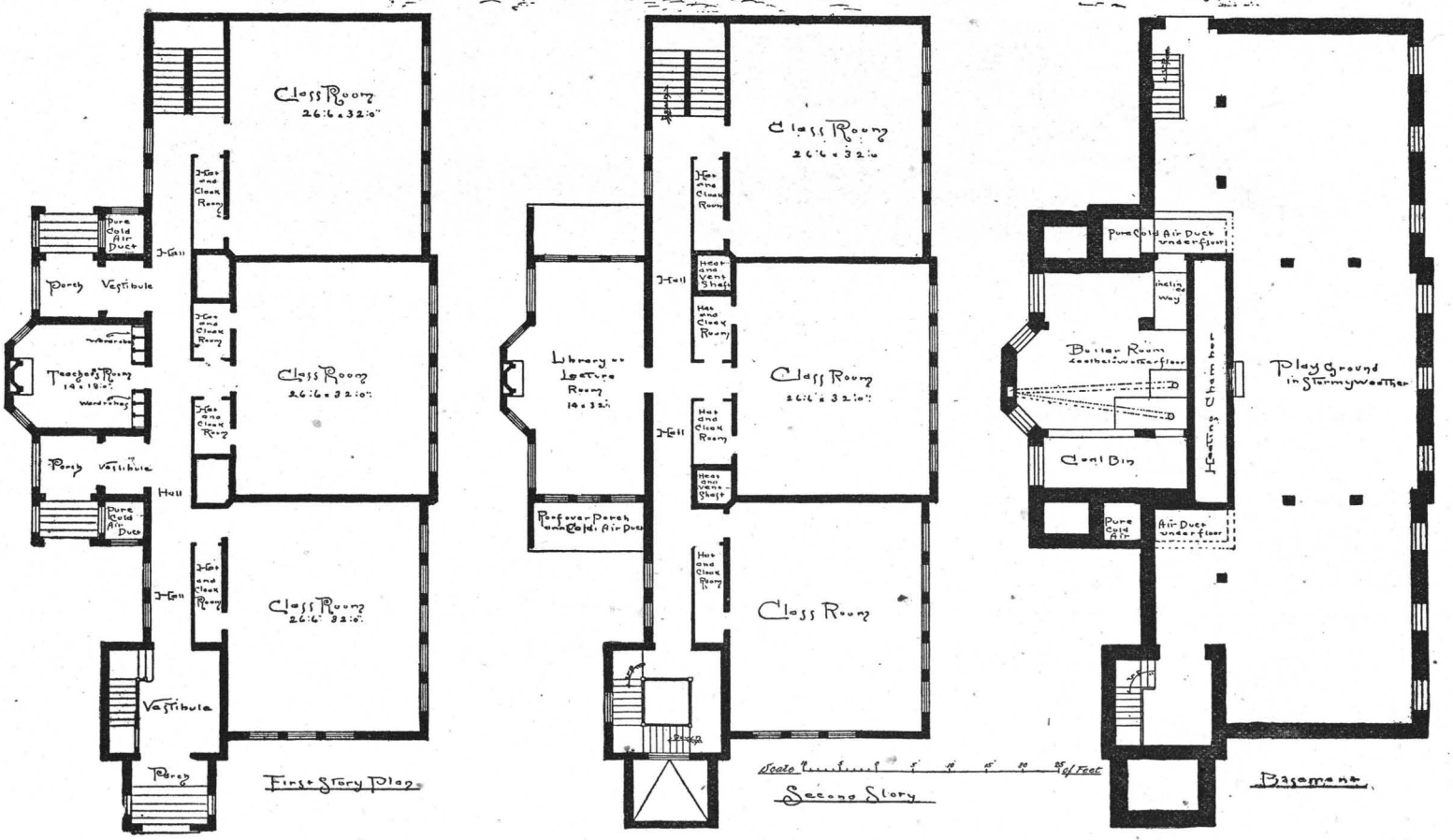


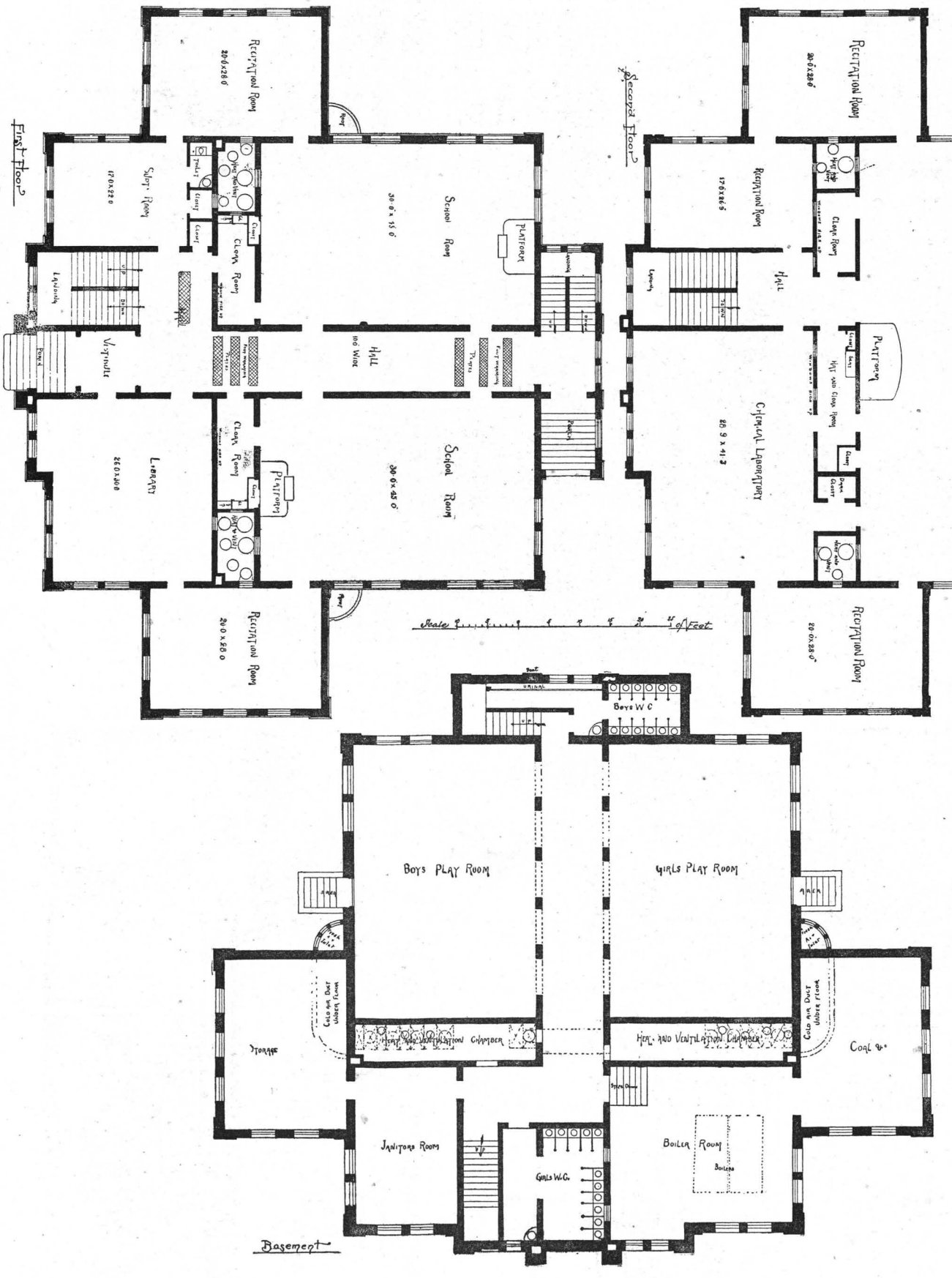


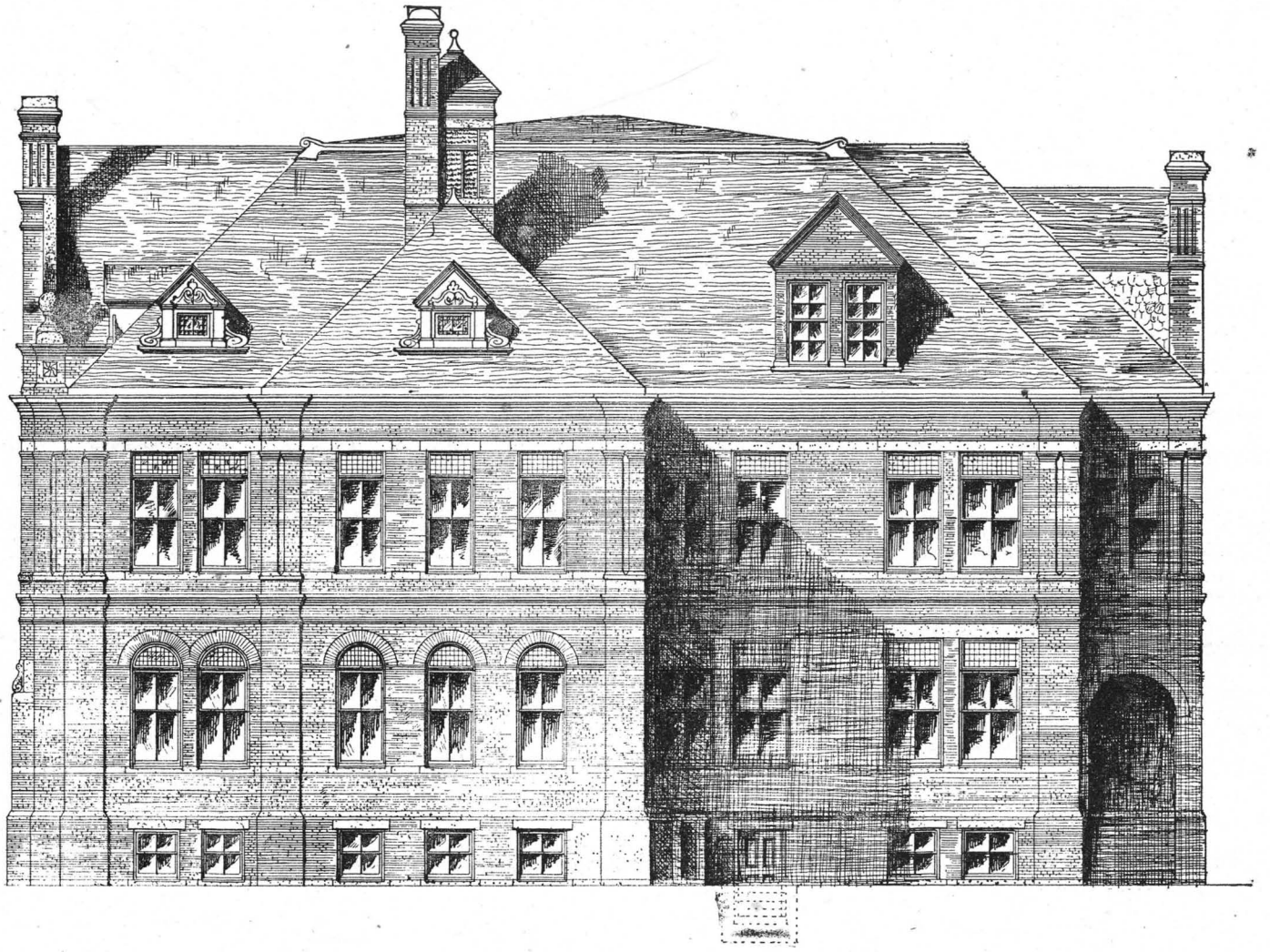
Design for Bryant School, Great Barrington, Mass.—Brick.





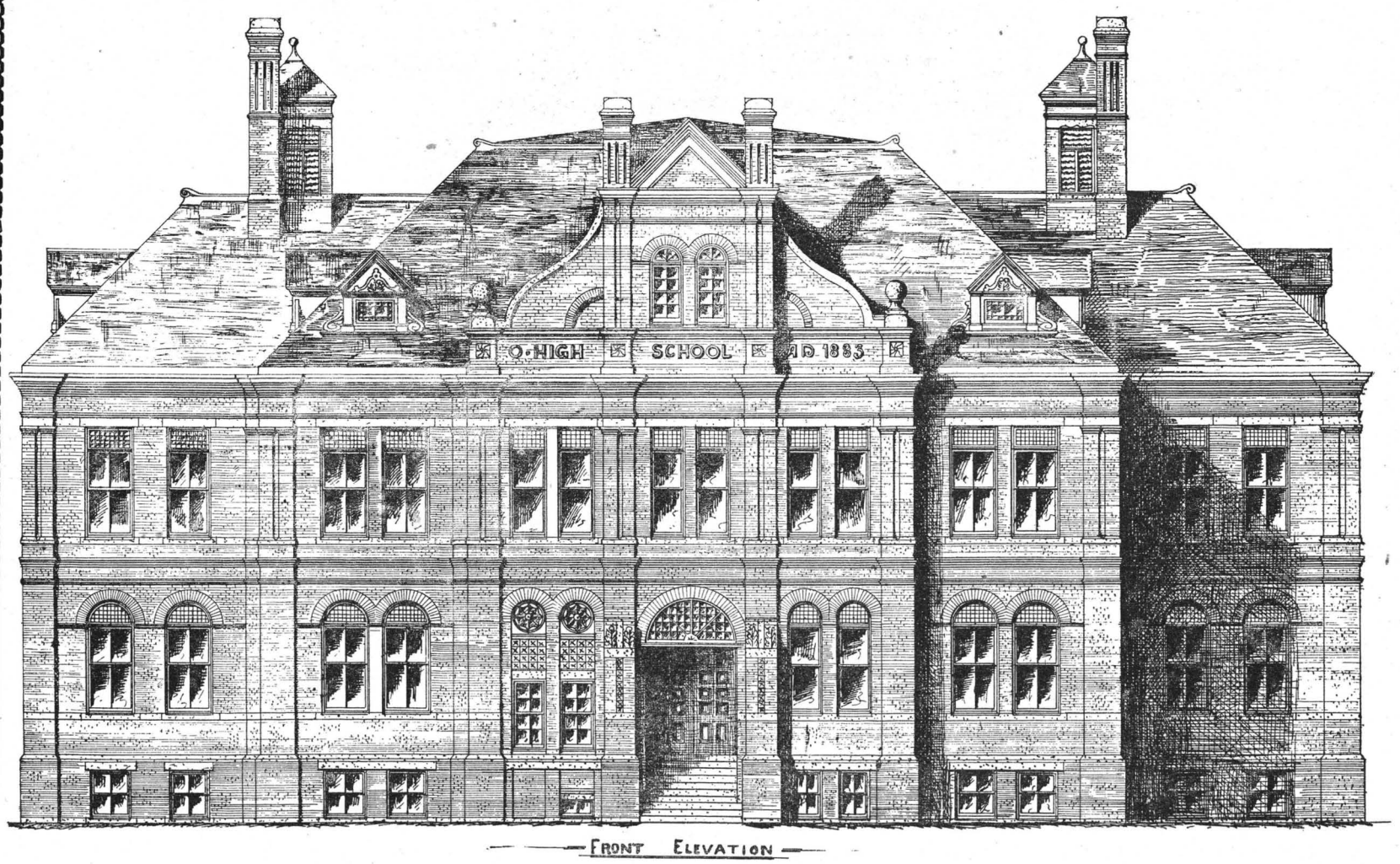




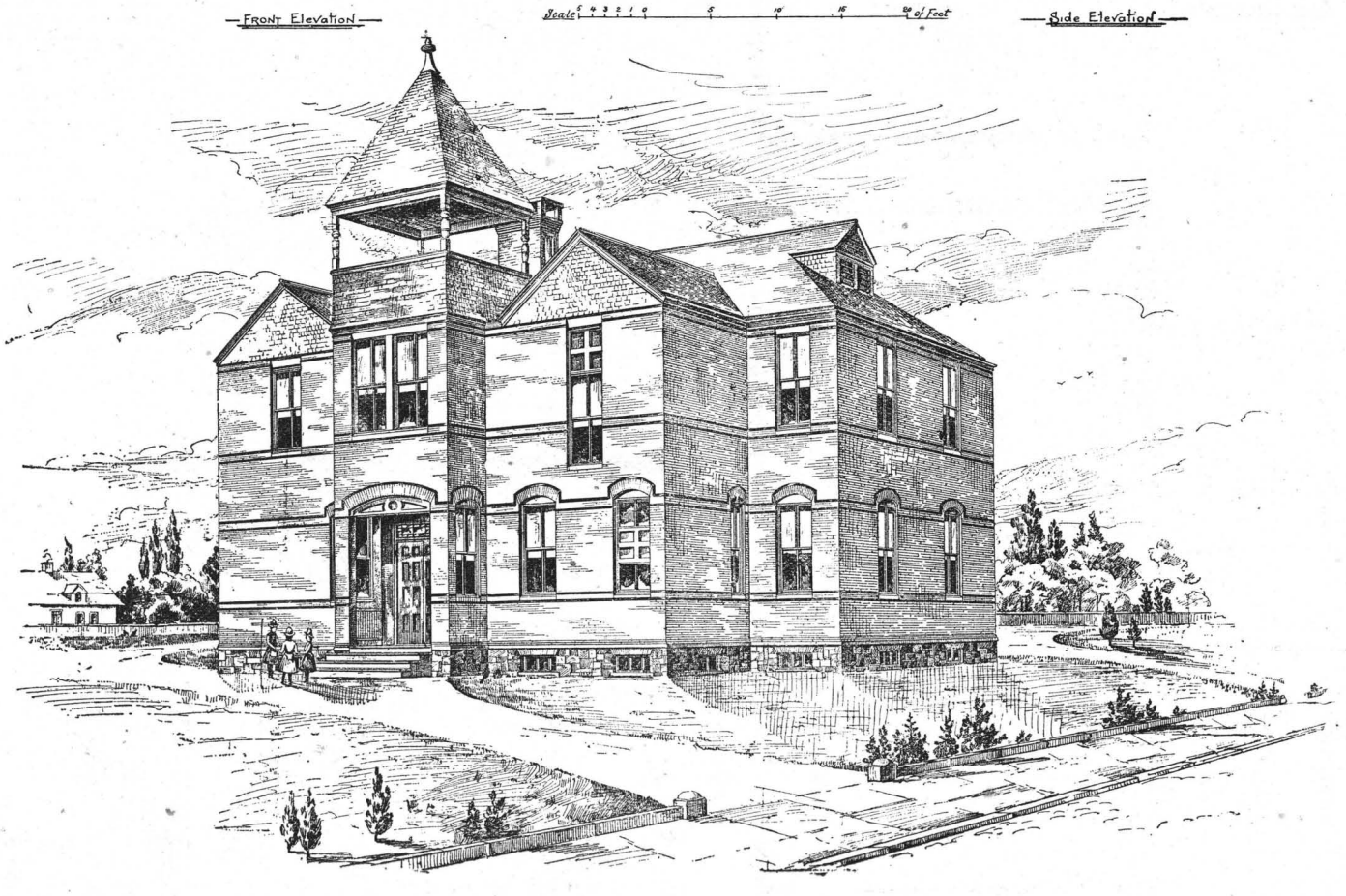


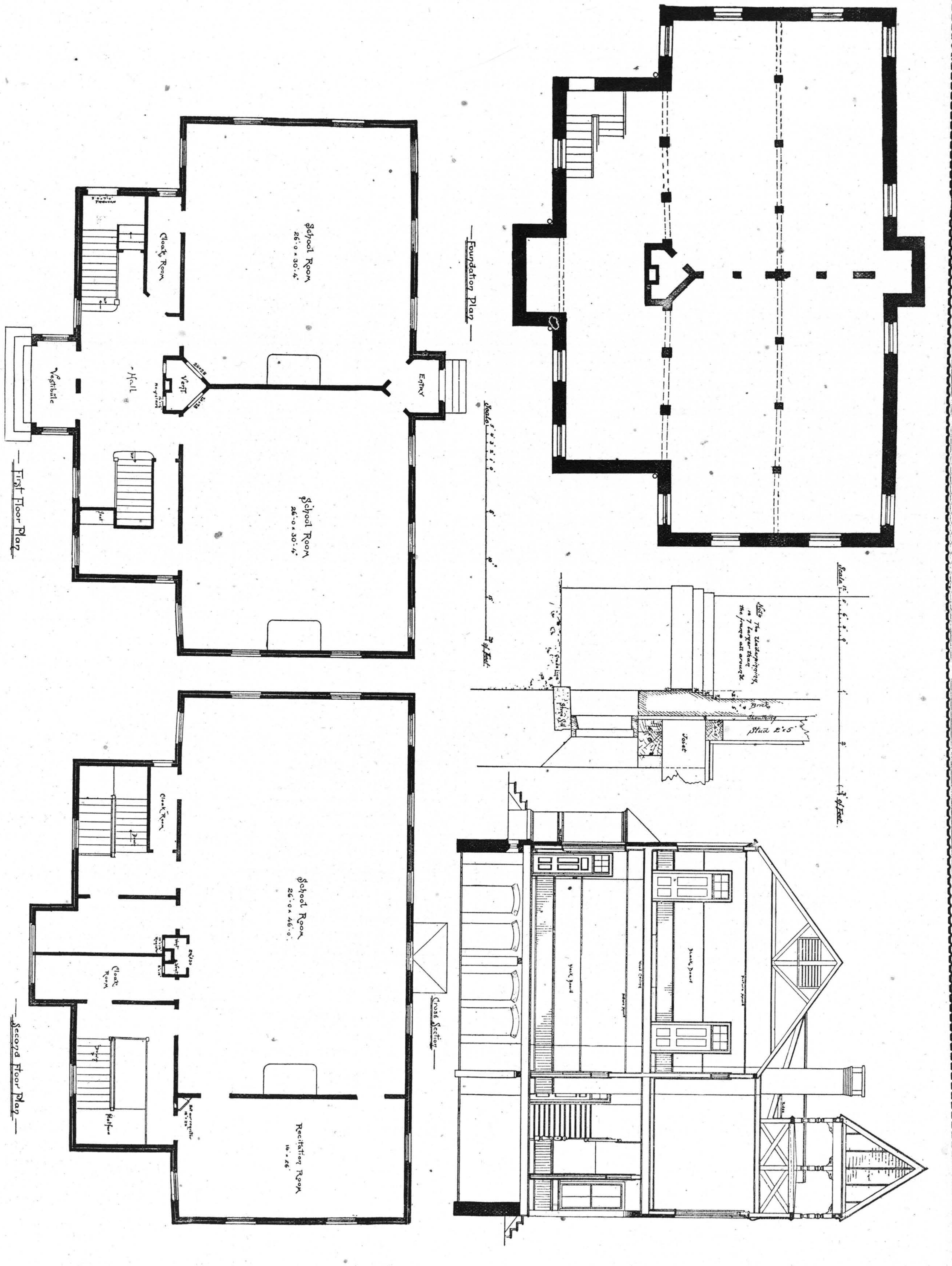
SIDE ELEVATION

Scale 1" 5' 0 5' 10' 15' 20' 25' of Feet



FRONT ELEVATION





Plates 53 to 58 illustrate the Village and City School-houses designed by PALLISER, PALLISER & Co. under the direction of a commission from the Government of Brazil sent to the United States with instructions to get the best plans adapted to climate and to meet the requirements, coupled with economy of construction, in that country. Of the Village School-house, combined with teachers' residence, 360 were ordered erected throughout the country, and of the City School-house 94 were ordered to be built in the cities of Brazil. The Village School-house, for which we here give full specifications, with bills of materials for its construction, has not been built in the United States, but the City School-house has been erected a great many times, in different materials, principally throughout the South, and at cost in brick of from $6,000 upwards. See page 4 of this book for further particulars.

SPECIFICATIONS

of the Works and Materials required in the Erection, Construction, and Completion of a One-story Brick Village School-house for Boys and Girls, with Teachers' Residence combined, to be erected on Ground situated

for the Government of Brazil, according to the Drawings, etc., prepared for the Same by Palliser, Palliser & Co., Architects, New York, U. S. A., and under the Personal Supervision and Direction of the Architects or Superintendent.

Drawings.

The several drawings herein referred to are as follows, and consist of:

Front Elevation		Plan of	Foundations.
Side	"	" "	Ground Floor.
Rear	"	" "	Second "
Cross-section	Framing	" "	Ground "
Longitudinal Sec.,	"	" "	Second "
Detail Drawings,	"	" "	Roof.

The above drawings, with exception of details, are all drawn to a uniform scale of ¼ inch to one foot, and the details 1½ inches to one foot.

The drawings and details show all dimensions and delineations of all exterior and interior work, which is thoroughly represented and set forth by the drawings.

The Contractor shall not make any alterations in the drawings. Should any error appear in them, he shall refer it to the Architects for correction.

The several drawings must all be accurately followed according to their scale, and in all cases preference must be given to figured dimensions over scale. All notes and explanations, wherever they may appear on drawings, must be carefully followed, as they, with the drawings and specifications, are all parts of the contract.

General Conditions.

The Contractor is to give his personal superintendence to the work, to furnish all transportation, labor, materials, apparatus, scaffolding, and utensils of all kinds whatsoever that is needful for performing the work in the best manner, according to the drawings and specifications.

All the materials are to be of good description and suitable in every respect for the purposes used.

The works are to be executed in the best, most substantial and thorough workmanlike manner, according to the true intent and meaning of these particulars and the Drawings referred to, and which are intended to include everything requisite and necessary to the proper and entire finishing of the building, notwithstanding every item necessarily involved by the works is not particularly mentioned; and all the work to be delivered up when finished in a perfect state, without exception.

The Contractor shall afford the Superintendent all the requisite facilities to enable him to inspect the work.

Mason Work.

Excavations. Excavate trenches for all walls to firm and solid ground, and none to be less than 16″ below grade; and at completion grade the excavated earth around the building.

Foundations. Lay down footings under all the walls of the building of flat stones not less than 6″ thick and projecting 2″ on each side of the wall above, to be composed of large stones, each stone filling the course in width and height, close fitted and flushed up with spawls and mortar; these stones to be laid on the natural undisturbed earth. From thence lay up the foundation walls with good flat building stone of flat bed, firm build, and well bonded, laid in clean, sharp sand, lime, and cement mortar, in parts of one of cement and two of lime, laid by and full to a line on the outside face; and flush and point at completion; the measurement on top to be accurate and the walls to be level for receiving brick work.

Make all openings in stone work as shown on plan, and carry over same a stone of requisite thickness and to have proper bearing at each end.

Privy Vault in Rear of Yard. Excavate for and stone up privy vaults as per details for same and 6 feet deep, the walls to be laid up dry with rough stone and properly levelled up on top to receive frame and cover rear portion of vaults, marked A with stone so that it can be removed and vaults cleaned out.

Brick. Use good, sound, hard, well-burnt brick throughout, those for face work to be selected and to be laid in red mortar and joints jointed; all to be laid in the best and most workmanlike manner with mortar composed of good lime and clean, sharp sand, in the proportions of two of sand to one of lime, or of such other proportions as shall be considered desirable.

The walls are 8″ thick, with exception of base and pilasters on corners, which are 12″ thick, and the projections or ribs in gables to form panels, which are 10″, projecting 2″ beyond panels.

The black brick to be made by heating the brick and brushing hot tar on them as long as they will absorb the tar. Any tar put on after the brick ceases to take it in spoils the brick, as they become glazed, which must be avoided, a dead black being desirable.

All the arches to be properly put in to centres, and the whole to be as per drawings and details.

Gratings for Ventilation. Supply and build in outside walls eight cast-iron 10″× 10″ gratings, three in each school-room and one in each class-room, where shown on drawings.

Terra Cotta. The cap over front door, scrolls and ball on front elevation to be of red terra cotta properly set and secured in position.

Chimneys. Build the chimneys as shown, and carry out above roof 8″ thick around flues, and top out as per detail drawings, using selected brick of even color, laid in red mortar joints jointed. Carry all partitions in chimneys from bottom to top.

Build in six 8″ × 10″ ventilating registers connected with flues in the following rooms, and as shown on plans: one in each class-room, one in living-room, one in kitchen, one in front bed-room, and one in hall on 2d floor.

Particular attention is required in the filling thoroughly of all upright joints in all of the brick work with mortar.

Steps. The two step stones to each outside door to be as shown, laid on good foundation, and to have good faces.

Wood Lintels to all openings, to carry inside half of brick walls above, to be furnished by carpenter.

Lathing. All stud partitions and ceilings and work that is furred off to be lathed with sound spruce lath, four nailings to each and joints broken every tenth lath.

Plastering. All walls, partitions, and ceilings, with exceptions named below, to be plastered one good coat of brown well-haired mortar, made of pure unslacked lime and clean, sharp bank sand, free from loam and salt, and best cattle or goat hair, to be thoroughly mixed by continual working, properly put on, and applied with sufficient force to secure strong clinches; level and float up smoothly and make it true at all points.

No plaster in ceilings of school-rooms or on partition in entry and passage around cloak-rooms.

Carpenter Work.

Timber. The timber used in and throughout the building to be spruce unless otherwise specified, to be of the best of their several kinds, sawn die square, well seasoned, and free from sap shakes and other defects impairing its durability and strength.

Lumber. The lumber to be of white pine unless otherwise specified; for outside work to be clear stock, and for interior 2d quality.

Framing. The framing and timbering to be done in the best manner; floor joists to be stiffly and fully spiked to bearings and to each other where they come together.

Do all necessary framing for stairway and chimneys, and properly mortised and tenoned together.

All partition studs to have solid footings and to be set double at angles, and openings blocked half-way up, and all to be set true and plumb. Bridge all partitions once in their height, and brace wherever necessary.

Floor Timbers. On ground floor in living-room and kitchen 3″ × 7″, 20″ centres, and elsewhere on ground floor 3″ × 6″, 20″ centres. 2d floor, beams 2″ × 7″, and ceiling beams over class-rooms and entries 2″ × 6″, 16″ centres, trimmer beams at stairs 3″ × 7″.

Partitions. Set partitions where marked on plans; the partitions dividing class and school-rooms set with 2″ × 6″ studs, 16″ centres, elsewhere with 2″ × 4″, 16″ centres. except closet and cross-partitions in teachers' residence, to be set with 2″ × 3″ studs, 16″ centres; the partition around cloak-room to be ceiled up vertically as shown on cross-section, with ⅞″ × 4½″ matched and beaded pine properly secured to framework; all stud partitions to have the necessary sills and plates.

Wood Lintels. Provide wood lintels 3″×5″ for all openings, and 5″ longer on each side than the opening.

Roofing Timbers to be framed according to the several drawings and with timbers of the following sizes: principal rafters 4″ × 8″; collar beams 4″ × 8″; purlins 4″ × 7″; kingposts 4″ × 5″; struts 4″ × 4″; plates 3″ × 5″; spars 3″ × 4″, 2 ft. centres; ridge-piece 1¼″ × 9″; short plates on which principal rafter foot 4″ × 6″. The above timber is for roofs over school-rooms and to be dressed; timber for other parts of roof to be rafters 3″ × 5″, 2 ft. centres; plates 3″ × 5″; valley rafters 2″ × 7″; collar beams 2″ × 4″, spiked to sides of rafters; braces 2″ × 4″ and 1¼″ × 6″, well spiked to sides of rafters and collar beams

Cornice. The eave and gable finish to be 1¼″ × 2″, piece all round above brick, cornice and slate to project ½″ beyond this.

Ridge. Prepare ridges for covering with zinc by slater by putting on 2″ × 8″ roll on top of 1½″ × 1½″ piece, all well secured to roof and as per details.

Roof Boarding. Cover the roofs of school-rooms with 1⅛″ × 6″ matched spruce boards, clean face down, and well nailed to every bearing with 10d nails. Other roofs cover with ⅞″ × 6″ matched spruce, well nailed, and joints properly broken.

Slaters' Work.

Furnish all materials and perform all labor requisite and necessary for completing the slaters' work in the most thorough manner known to the trade. Cover the roofs with best selected Bangor, Pennsylvania, black slate 9″ × 18″ in size, laid with a lap of at least 3″ of the third over the first; the slates to be properly drilled and trimmed, each slate to be nailed with two galvanized-iron nails; all nails to be covered up, and the roof warranted tight for two years. Cover side walls over roofs, where marked, with slate in like manner.

Cover roof of outbuilding with slate.

Felting. Previous to laying slate, cover all the roofs with Neponset black felt paper, carefully stretched, lapped, and tacked on.

Flashing. Flash all valleys and angles with heavy zinc 14″ wide, covering zinc with slate flashing at every course of slate. Cover the rolls of ridges as prepared, and secure the zinc close in to slate, to under side of roll; and zinc to cover nail-heads of last course of slate; and all to be done in the best manner to make tight job.

The hips to be mitred and slate laid, and made tight in paint skins.

Flashing around Chimneys. Flash the chimneys with zinc; step-flash those on the rake of the roof; cap the flashing and turn the zinc into the mortar joint, and point the brick work, and secure with slaters' cement; the flashing to extend perpendicularly under the cap, and terminate; the cap, which is secured in the brick joint, to follow down plumb to within a half-inch of the slate, and there stop.

Windows. Windows and window frames all to correspond with the drawings; frames to be made out of 1⅛″ plank and to be 4¼″ wide, and each sash to be hung to frames with two heavy wrought-brass 3½″ butts, and secured with hook inside, and to have rod on sill to keep sash open at will; to have ⅞ × 4 beaded casing on inside as per details; sash to be made out of best clear, dry white pine, 1⅛″ thick, with acorn moulded bars, and to be glazed with good American sheet glass to be well bedded, tacked, and puttied.

Flooring. Lay the ground floor throughout with 1⅛ × 4½ matched spruce flooring, well nailed to every bearing with 10d nails. Lay the 2d floor with ⅞″ × 6″ matched spruce flooring, and nail thoroughly.

Louvres. The louvres or ventilators in gables to be constructed as shown by the details and on the principle of blinds; the boards or slats being wired to rod with heavy copper wires, so that they can be opened or shut at pleasure.

Doors. The outside doors to be made out of ⅝″ thick beaded pine, thoroughly secured on to 1⅛″ framework as per details, and to be hung with two heavy iron butts, and to have bolt and latch inside doors in schools ⅝ on 1″ framework; two outside doors to house to have mortise locks.

The inside doors in teachers' house to be 4-panel doors and hung with 2—3″ loose joint butts, and secured with latches; closet in kitchen and bedroom, doors to hall, each to have a rim lock.

Door Frames and Casings. Outside door frames to be made out of 2″ × 4¼″ plank, rabbeted to receive doors swinging inside, as per details; riser of ⅞ pine; sills 1½″ thick, of hard wood; inside casing ⅞″ × 4″, and beaded.

All casings on inside doors and windows to be ⅞″ × 4″, and beaded, and doors to have ⅝ × 1¼ ogee moulded stops, jambs ⅞ thick.

Base. Put down 1″ × 7″ base, bevelled on top, in all rooms throughout the building.

Furring. Cross-fur ceilings of teachers' house, 2d floor, with 1 × 2 spruce strips, 16″ centres, for lathing also do any other furring under stairs and elsewhere as required by the design. No furring on outside brick wall; plaster on brick.

Cloak-rooms, Closets, etc. Put up 150 ft. of 1 × 4 wardrobe strips in the two cloak-rooms, and put up 30 ft. of strips ⅞ × 4 in closets in teachers' house, and on the whole of these strips put up 250 double black japanned heavy wardrobe hooks, and put 60 ft. 12″ shelving in closets on cleats.

Stairs. Build a flight of box stairs, ⅞ risers, 1⅛ treads, and strings up to 2d floor as shown.

Outbuilding to be 7 × 15 ft. in size, as per drawing, and ceiled up vertically on sides with matched pine boards; doors to be battened, to have latches, and hung with heavy strap hinges, also one lock and bolt, 4 sash, 6 lights, 6 × 6 each, 1¼ thick; to have necessary framework and roof boarded for slating.

Put up seats as shown, also trough in water closet, all properly connected to vaults.

Put ventilators on top of roof as shown.

Painting.

Properly prepare all woodwork inside and outside of the building, except floors, and paint two good coats of C. T. Raynolds & Co.'s liquid paints in the following colors (putty up smoothly after first coat):

Exterior. Casings, etc., dark olive drab; sash, white; doors, invisible green.

Interior. Ground-work, roof boards in ceilings, and panels, light drab; casings and timber work, medium drab.

Paint outbuilding to correspond.

Bill of Quantities of Material required in the Erection of Village School-house and Teachers' Residence, as per Plans, etc., prepared by Palliser, Palliser & Co., Architects, New York, U. S. A.

100 cubic yards excavations.
1400 ft. stone work, cement, lime, etc., to lay same.
52,650 brick, and mortar to lay same.
12 stones for steps to outside doors.
8 cast-iron grates for walling in for ventilation, 10″ × 10″.
6 8 × 10 ventilating registers for flues in chimneys.
2 terra-cotta caps for pilasters center front gable.
2 terra-cotta scrolls.
1 " " cap over front door.
708 yards plastering.
12000 plaster laths.
86 lbs. lath nails.
18 barrels lime, also hair and sand.

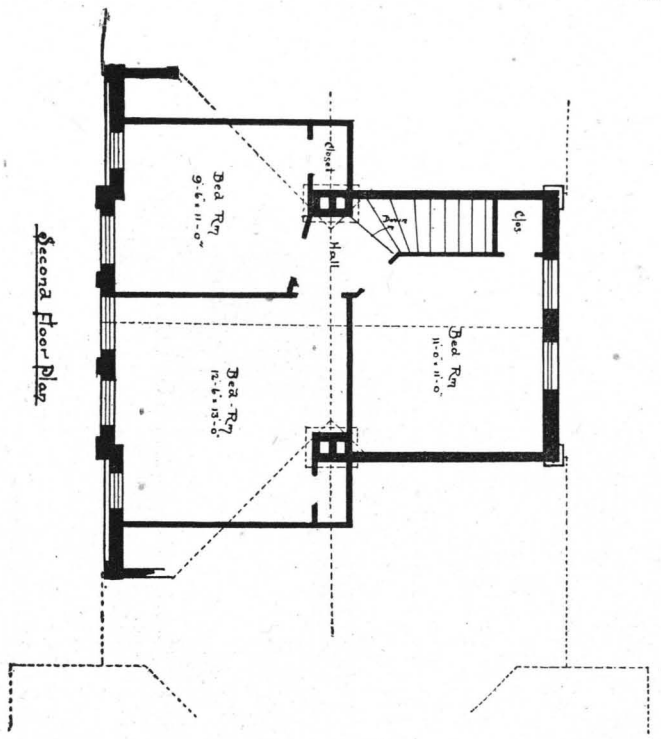
All dressed timber for school room roofs.

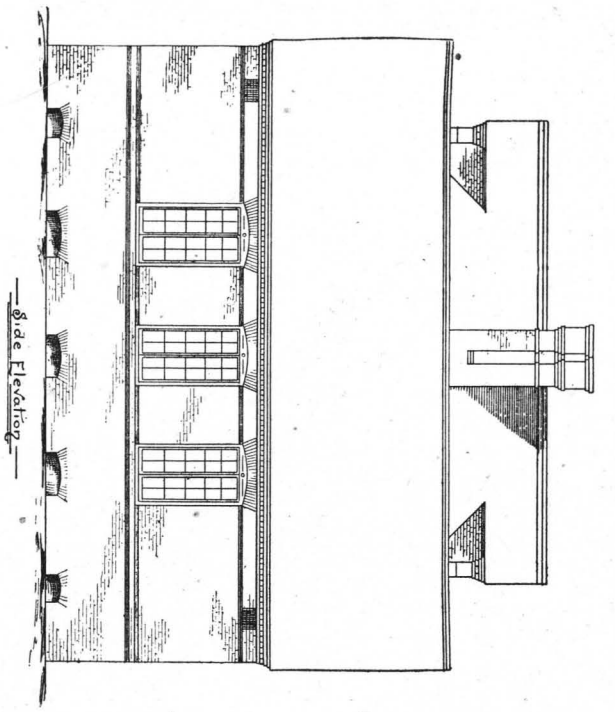
8 collar beams	4 × 8—14 ft. long.	
16 principal rafters	4 × 8—14 " "	
10 purlins	4 × 7—14 " "	
8 kingposts	4 × 5— 8 " "	
8 struts	4 × 4— 9 " "	
5 ridge boards	1¼ × 9—15 " "	
10 plates	3 × 5—14 " "	
72 spars	3 × 4—15 " "	

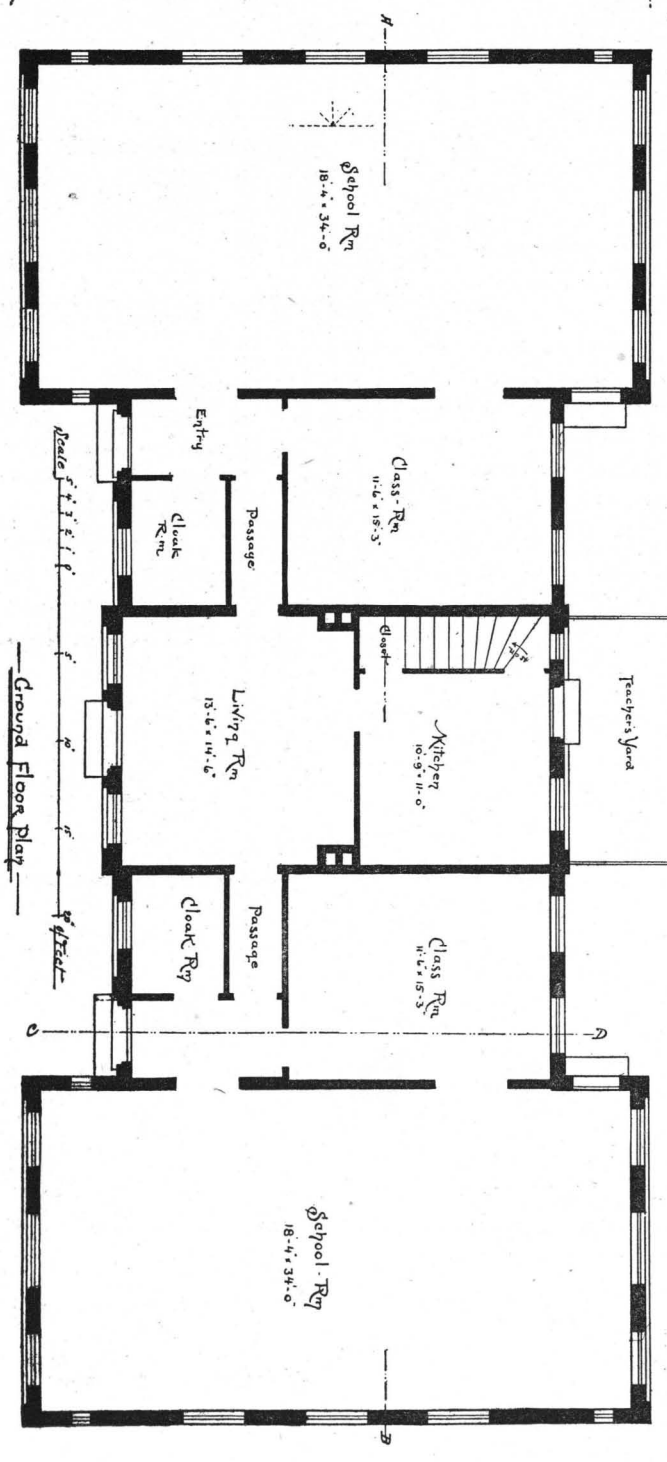
1500 feet 1⅛ × 6 matched roof boards—roofs of school-rooms.

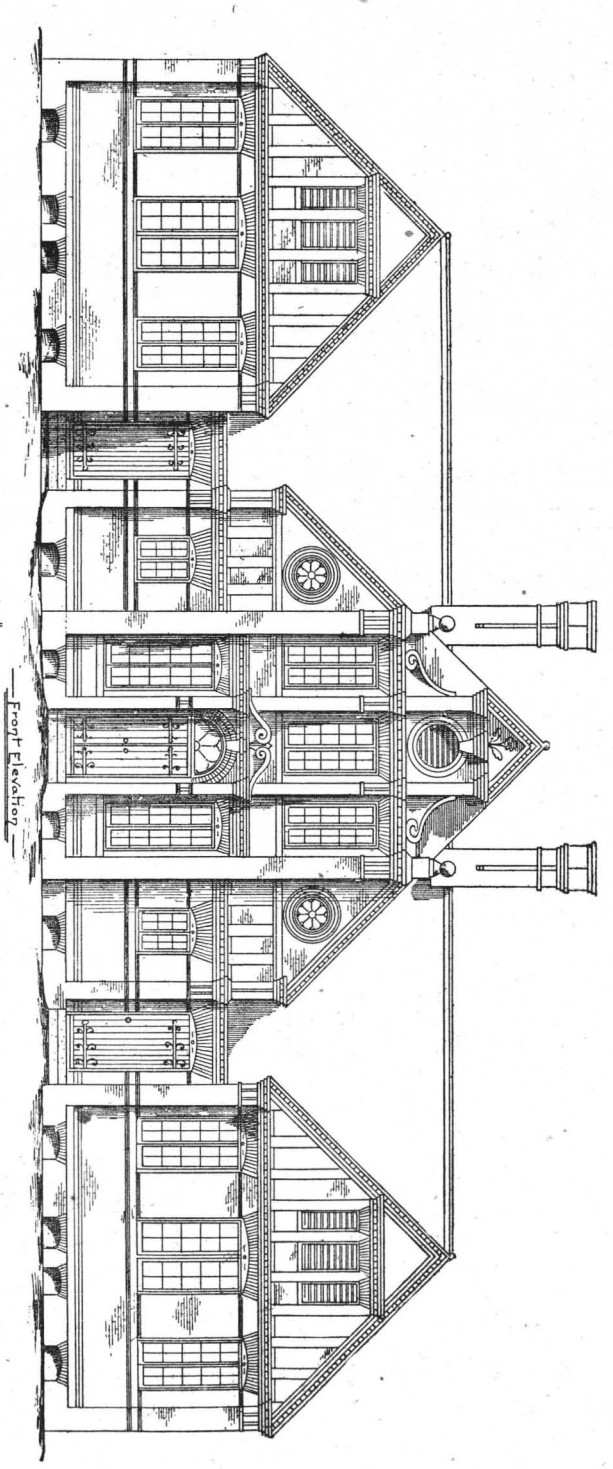
6 ridge boards	1¼ × 7—13 ft. long.
34 spars	3 × 5—18 " "
16 "	3 × 5—12 " "
6 "	3 × 5—21 " "
4 "	3 × 5—20 " "
2 plates	4 × 6—25 " "
2 "	3 × 5—12 " "

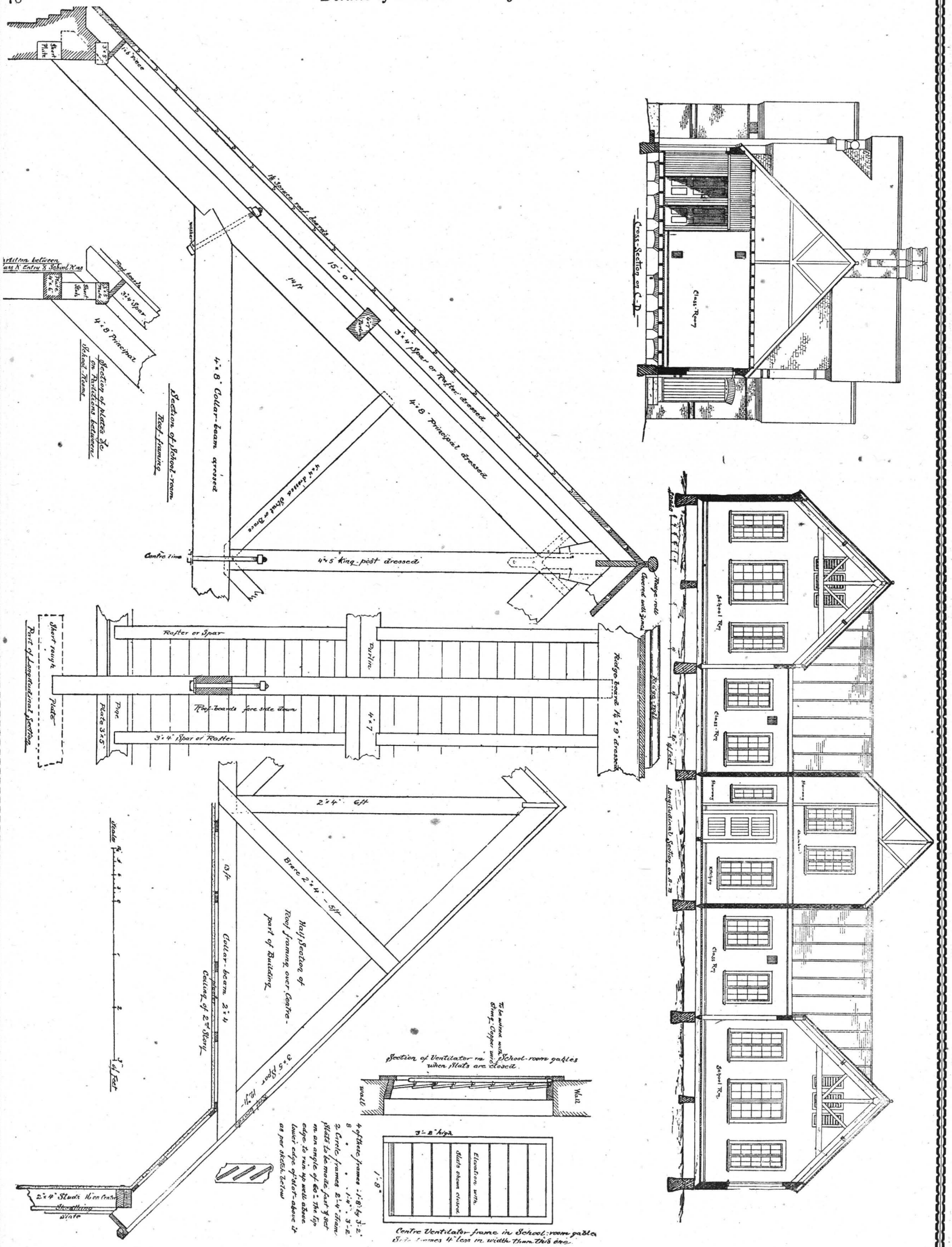
1 plate 3 × 5—12 ft. long.
2 valley rafters 2 × 7—15 " "
14 collar beams 2 × 4—13 " "
14 braces 2 × 4—10 " "
7 upright braces in centre roof 2 × 4—12 ft. long.
10 collar beams over class-rooms 2 × 4—14 ft. long.
10 braces, etc., in roofs 1¼ × 6—13 ft. long.
2 plates 4 × 5—12 ft. long. To cut for principals to foot on.
15 1st-floor timbers 3 × 7—15 ft. long.
30 " " " 3 × 6—13 " "
40 " " " 3 × 6—19 " "
2 2d " " 3 × 7—15 " "
11 " " " 2 × 7—15 " "
2 " " " 2 × 7—13 " "
6 " " " 2 × 7—12 " "
1 " " " 2 × 7—11 " "
41 " " " 2 × 6—13 " "
200 lineal ft. 3 × 5 for wood lintels over doors and windows
8 studs in school-room partitions 4 × 6—11 ft. long.
26 studs in school-room partitions 2 × 6—11 ft. long.
6 studs for heads 2 × 6—11 ft. long.
50 studs in partitions 2 × 4—19 ft. long.
200 lineal ft. 2 × 4 for plates and sills to partitions.
48 lineal ft. 2 × 6 for plates and sills to partitions.
45 studs in partitions, teachers' house, 2 × 3—19 ft. long.
8 2 × 3—13 ft. long, for anything—cutting up, etc.
8 2 × 4—13 ft. long, for anything—cutting up, etc.
130 lineal ft. 2 × 3, dressed for posts, rails, etc., for partitions in class-room and entries.
150 lineal ft. 2 × 3, ridge roll.
150 " " 1½ × 1½ " "
9600 ft. matched ⅞ × 6, roof and sheathing boards.
1200 ft. matched ⅞ × 6, flooring for 2d floor.
3860 " " 1⅛ × 4½, " " 1st "
50 furring strips 1″ × 2″—13 ft. long.
12 strips for girts 1 × 4—12 ft. long.
136 lineal ft. 1 × 6, dressed for filling between rafters at bottom in school room.
400 lineal ft. 1¼ × 2, for eave and gable crown mould.
500 lineal ft. 1 × 7, base board, bevelled on top.
12 strips pin rail 1 × 4—13 ft. long.
60 ft. 12″ shelving-closets, teachers' house.
30 lineal ft. pin rail ⅞″ × 4″, teachers' house.
700 ft. ⅞ × 4½ beaded and matched (both sides clean), for partitions in cloak-rooms and entries.
450 lineal ft. ⅝ × 1¼ ogee stop for doors in partitions.
5 kegs 10d nails.
1 keg 8d nails.
½ keg 30d nails.
½ keg finishing, 6d, 8d, and 10d, equal parts of each.
10 lb. clinch nails 2″.
250 wardrobe hooks, double black japanned, heavy.
2 outside door locks, mortise for teachers' residence.
3 rim locks on 2d floor.
1 rim lock for closet in kitchen.
23 rim latches for doors.
5 bolts—black japanned barrel—for doors.
2 flush bolts for front doors, double to teachers' house.
16 ¾″ bolts 18 inches long, and washers for collar beams and principal.
8 ¾ bolts 16 inches long, and washers for kingpost and collar beam.
1 flight of box stairs, ⅞ risers, 1⅛ treads, and strings.
5 2—6 × 6—8—1¼ plain 4-panel doors inside teachers' house.
2 2—8 × 6—8—1¼ plain 4-panel doors inside teachers' house.
3 2—2 × 6—8—1¼ plain 4-panel doors inside teachers' house.
1 2— 4 × 6—8—1¼ plain 4-panel doors inside teachers' house.
400 ft. 4 × ⅞ plain casings for both sides and door jambs.
40 6 × ⅞ plain jambs.
4 2—10 × 7—0 batten, 1″ frame, and ⅝ beaded-panel, class and cloak-room doors.
2 2—6 × 7—0 batten, 1″ frame, and ⅝ beaded panel, class and cloak room doors.
4 3—8 × 7—0 batten, 1⅛ frame, and ⅝ beaded panel, school-room doors.
17 pair 3″ loose joint butts and screws.
4 " " 4″ " " " " "
6 doors. For all outside doors and frames see details.
6 pair 4″ loose joint butts and screws.
8 hinge plates, iron, for front doors. See door details.
33 window frames with casings inside; sash, brass hinges, and other fastenings as per details.
2 circle window frames and sash. See detail.
12 louvre or ventilation frames with movable slats complete, with inside casings, etc. See detail.
2 circle louvre frames with slats, stationary. See detail.
3950 ft. 1st quality Bangor, Pa., slate, 9 × 18, for roofs of school.
160 ft. 1st quality Bangor, Pa., slate, 9 × 18, for roofs of outbuilding, with nails, felt, and zinc flashings.
25 gallons liquid paints.
1000 ft. matched pine boards, 12 ft. lengths, dressed both sides, for outbuilding, doors, sides, etc.
5 pieces spruce timber 3 × 5, 15 ft. long.
5 " " " 2 × 4, 15 " "
2 " " " 2 × 5, 15 " "
9 " " " 2 × 4, 10 " "
4 single sash, 6 lts., 6 × 6, 1¼ thick.
4 pair 10″ strap hinges for doors.
4 thumb latches.
1 lock and one 4″ bolt.

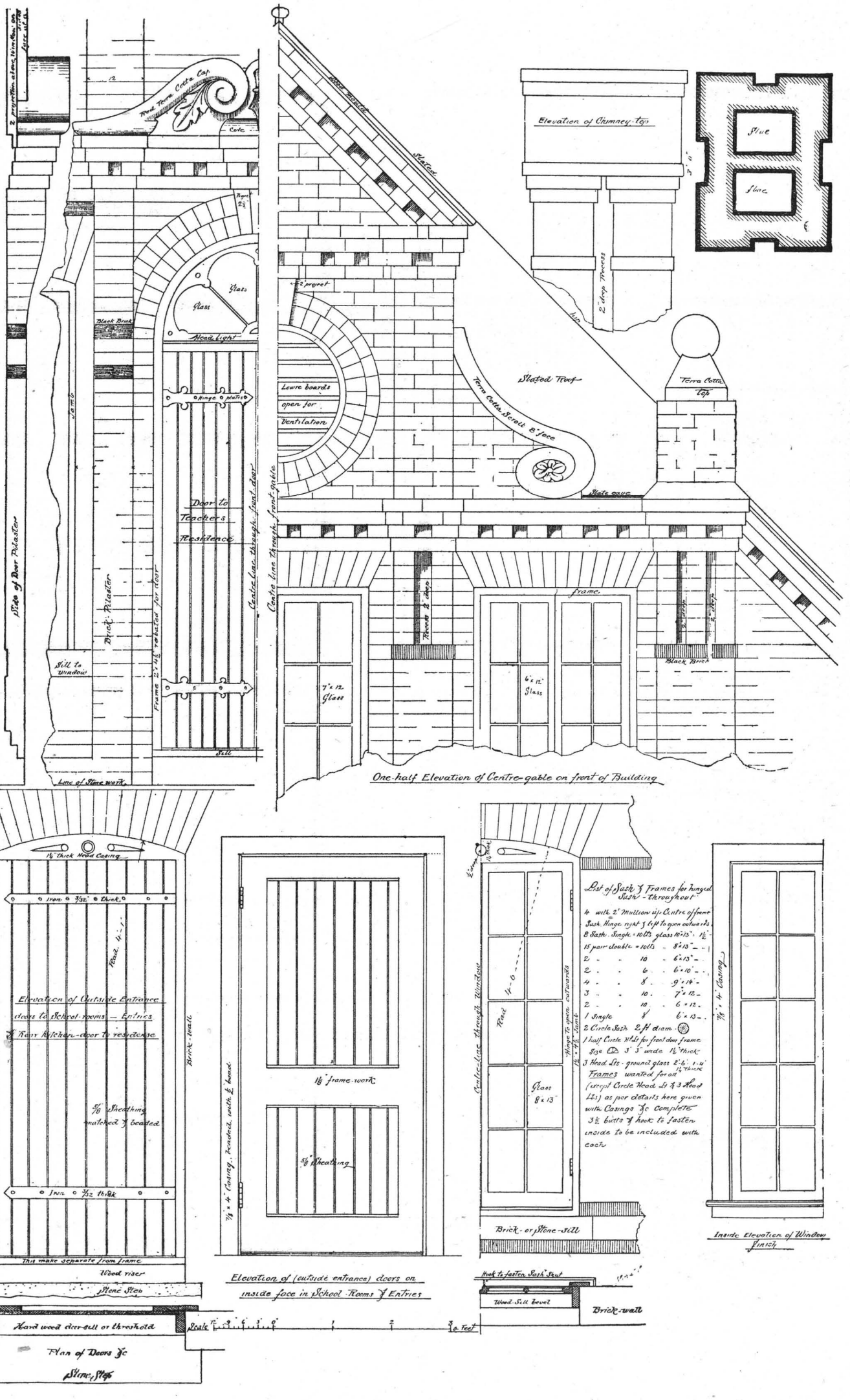


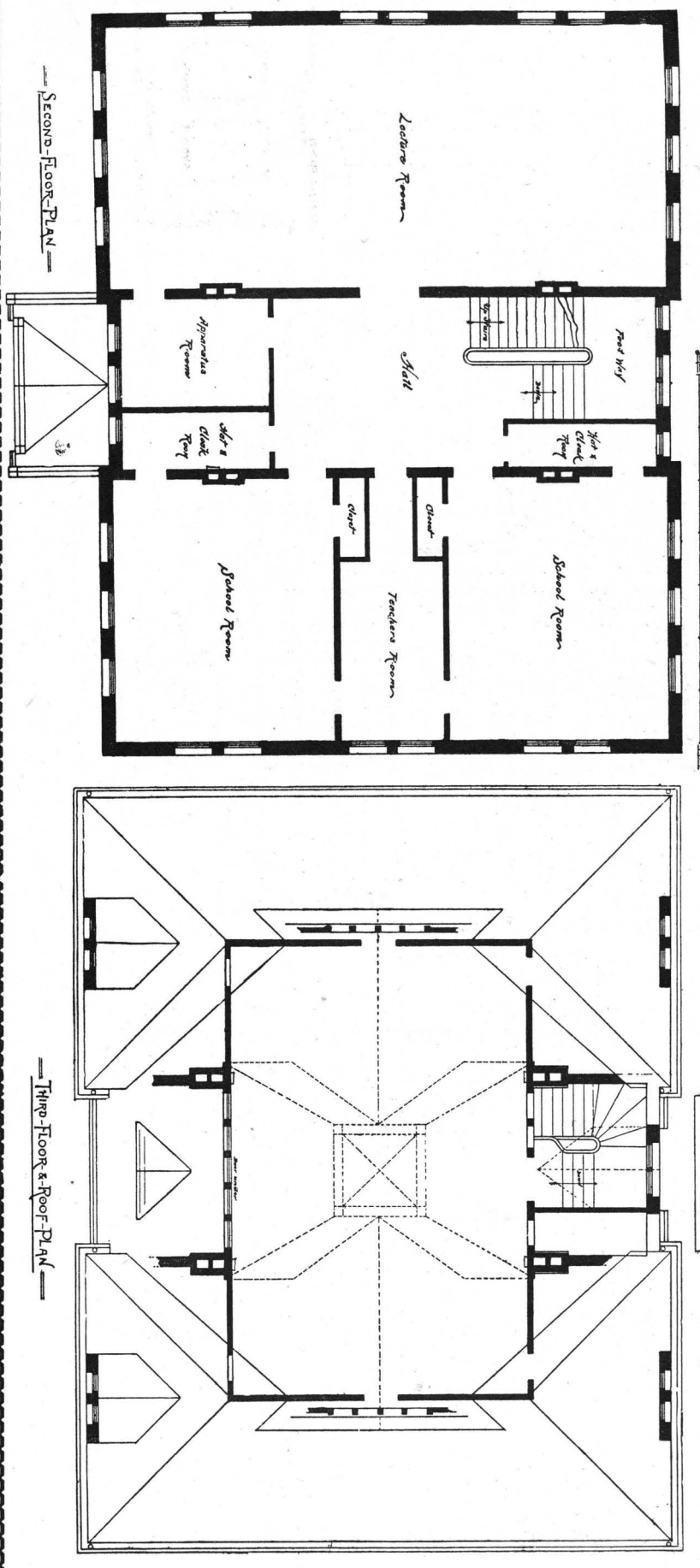


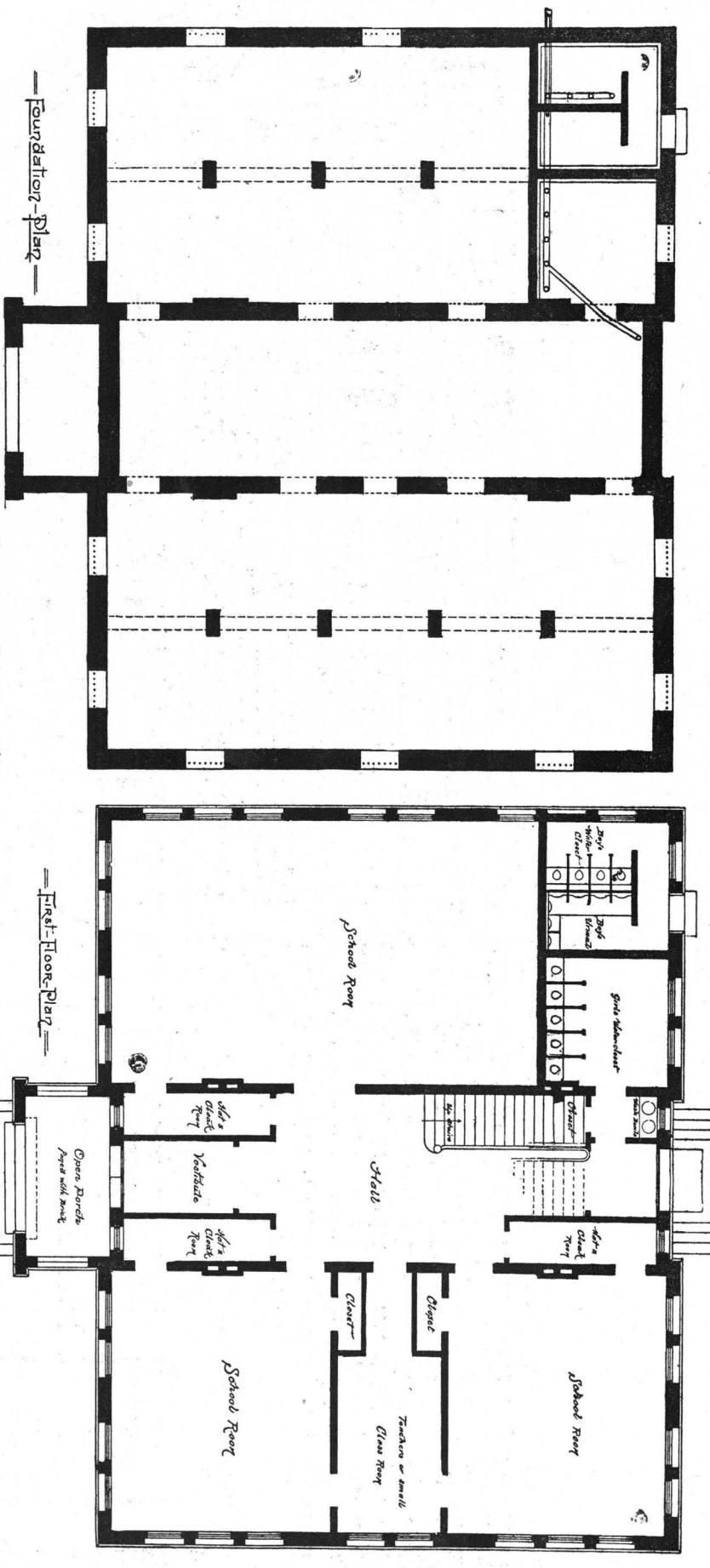


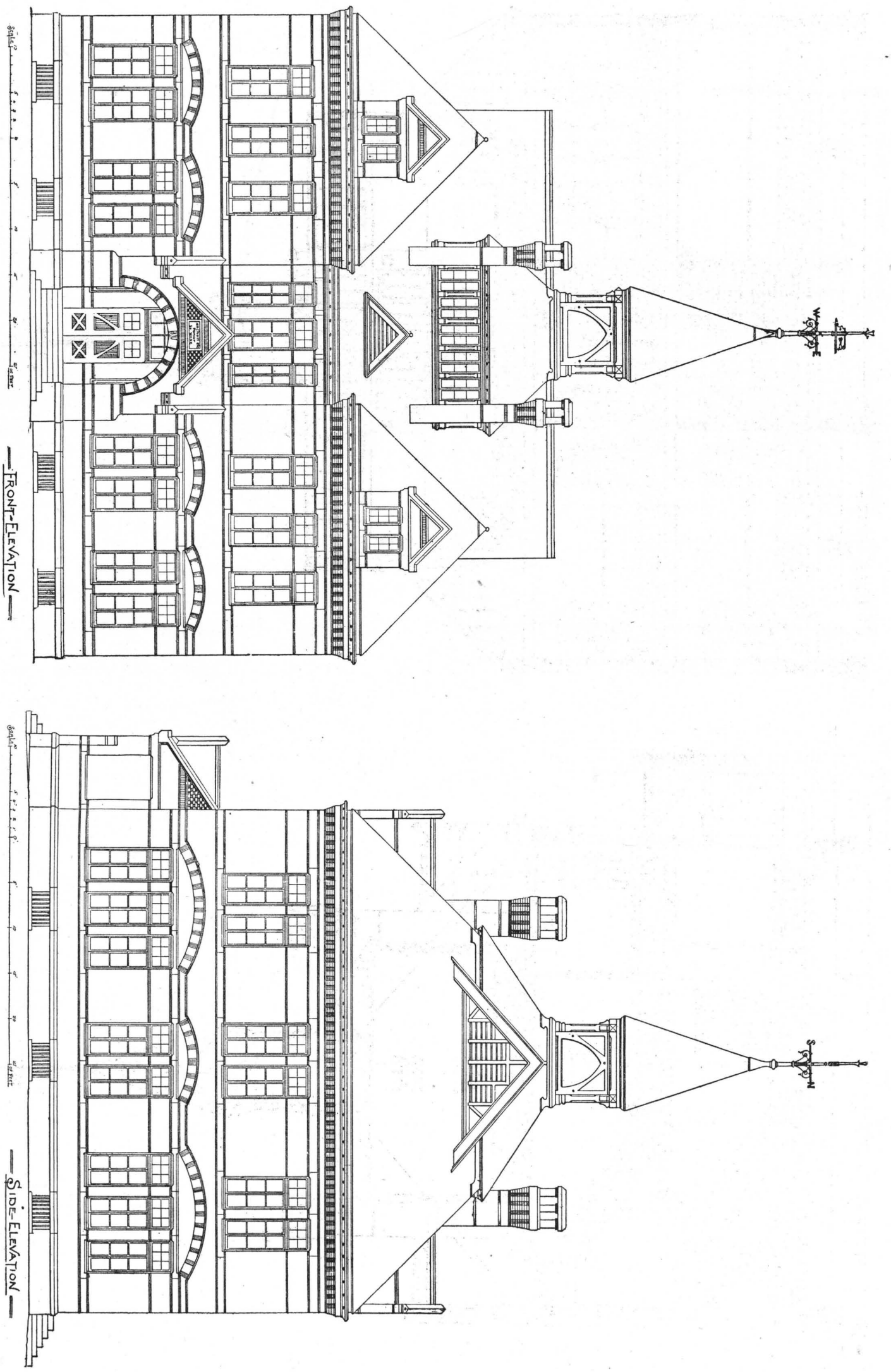


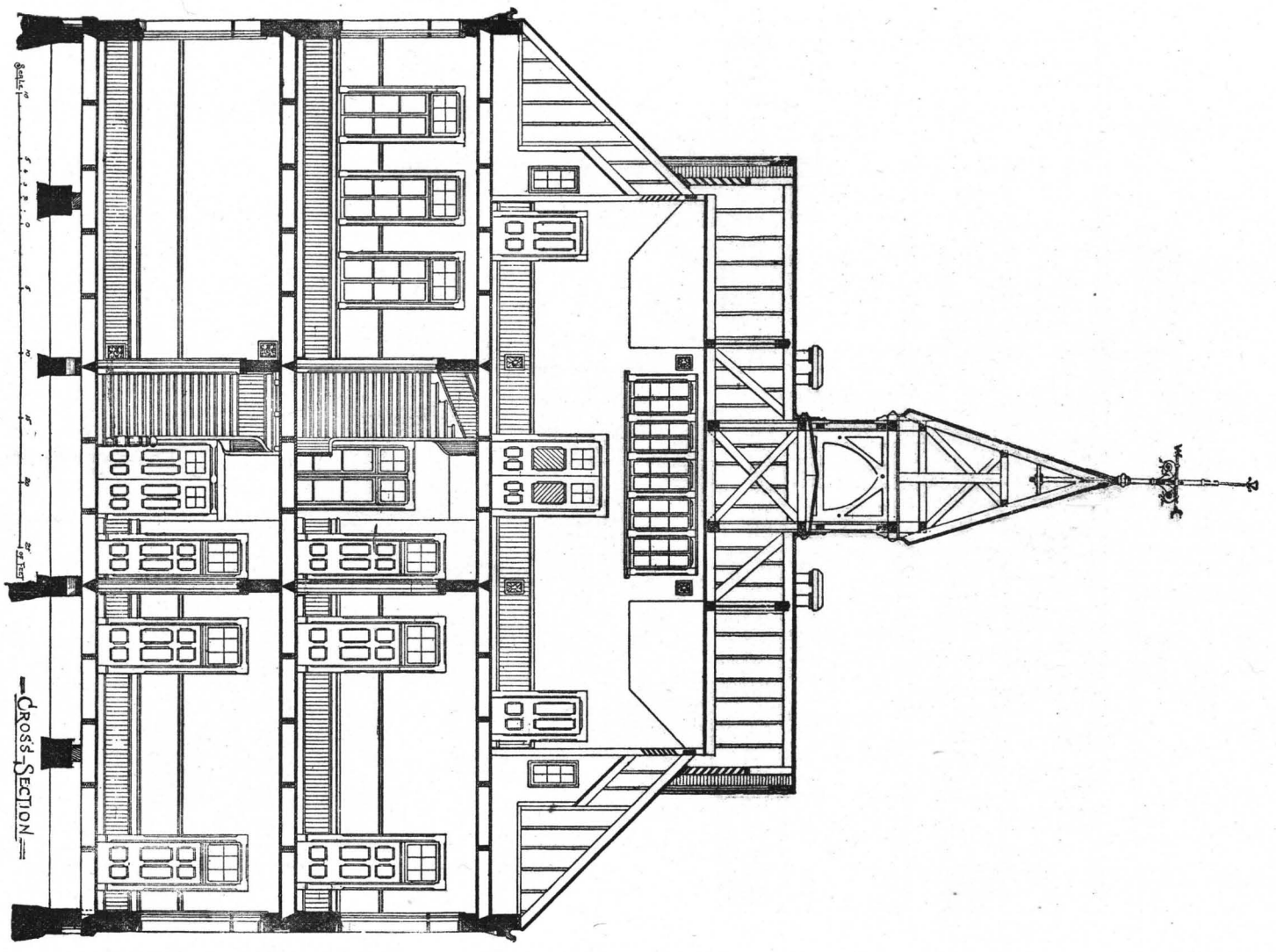


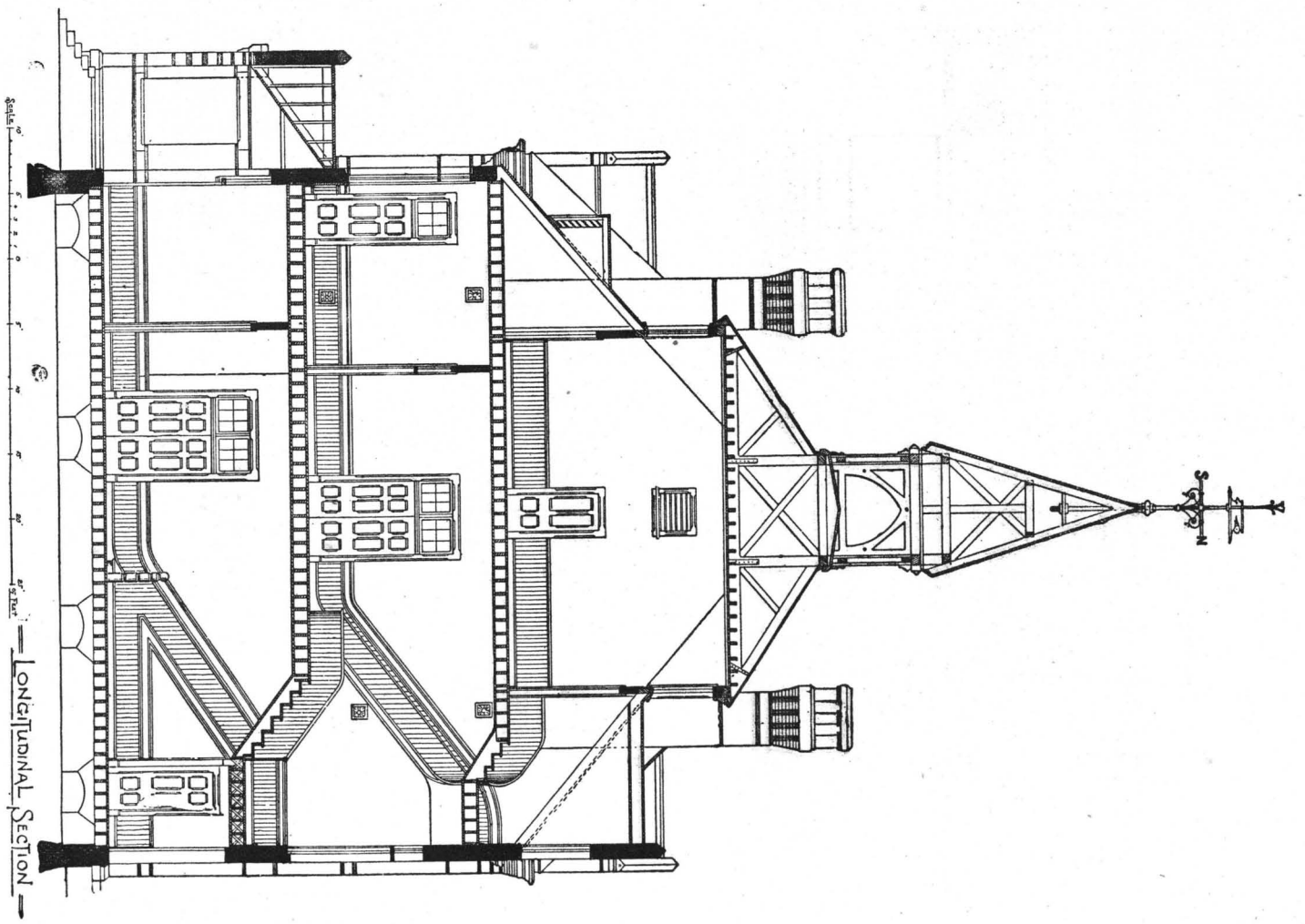


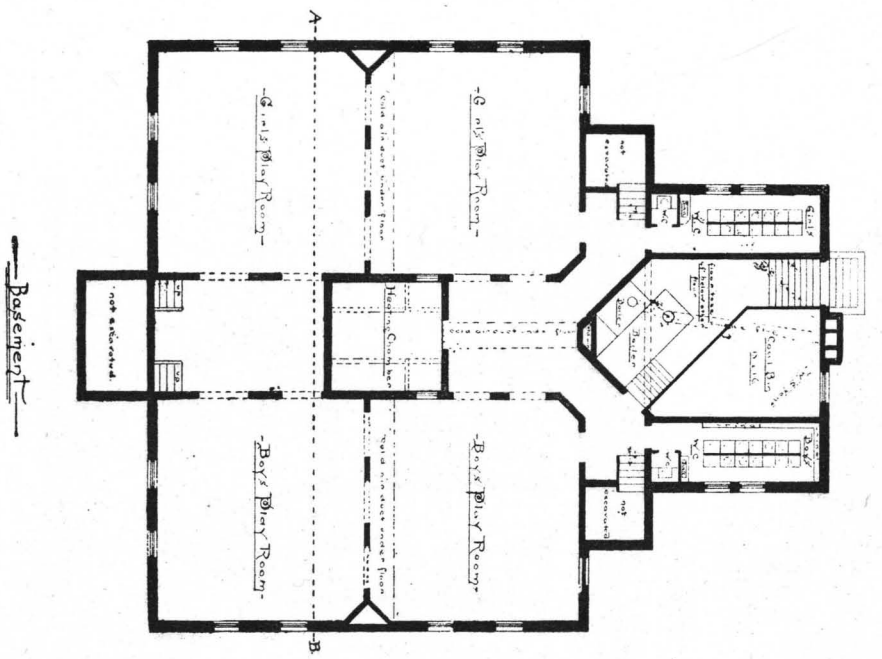


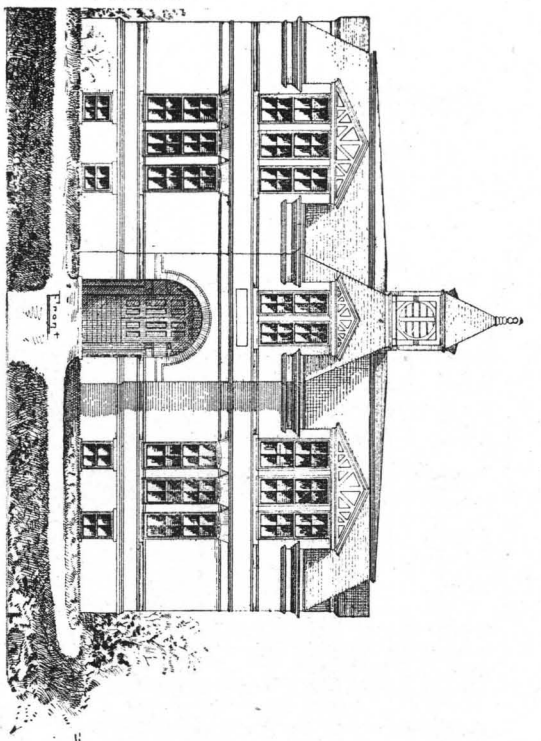


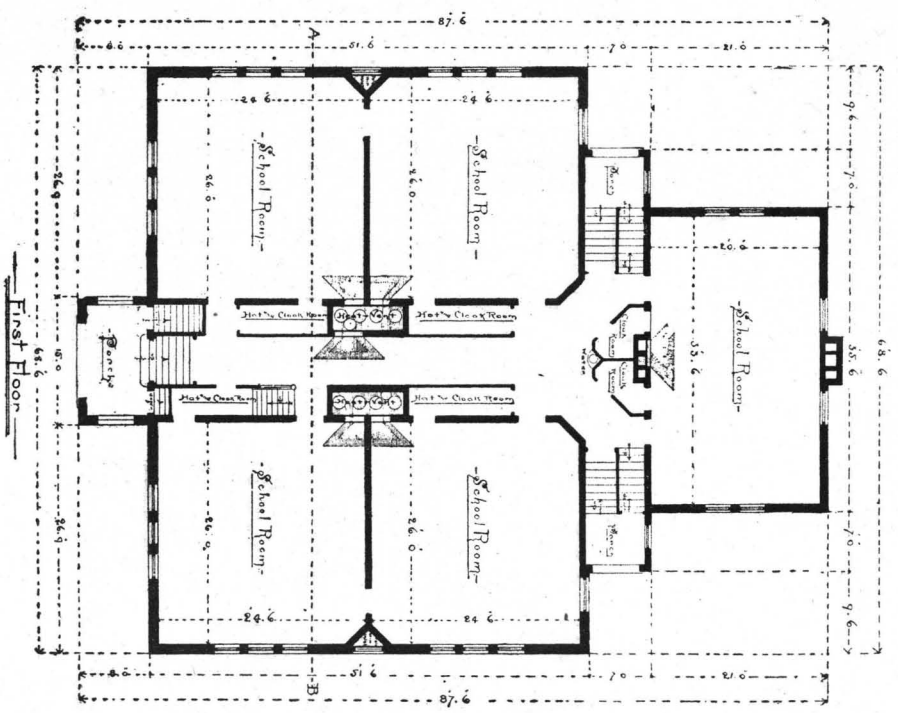


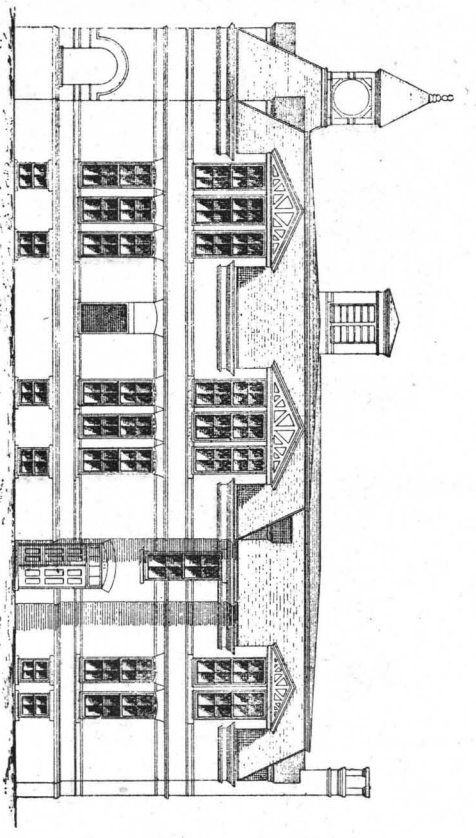


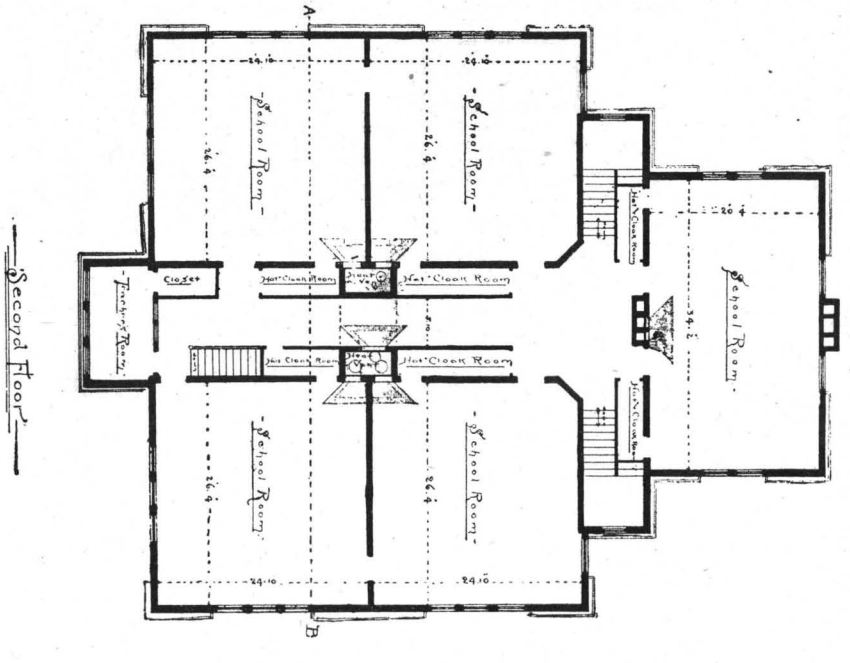


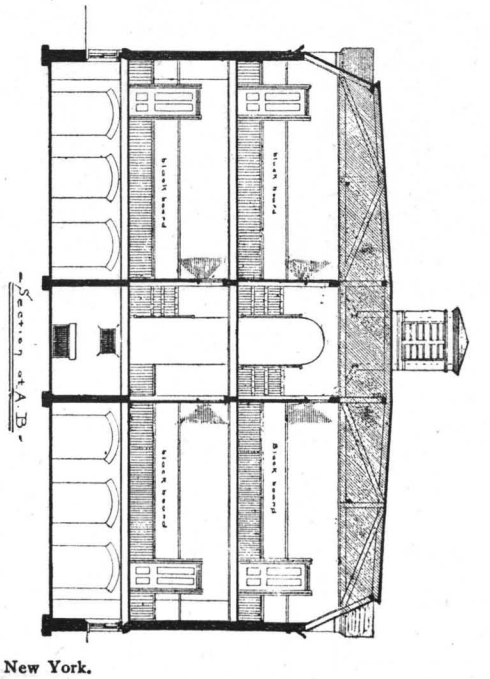








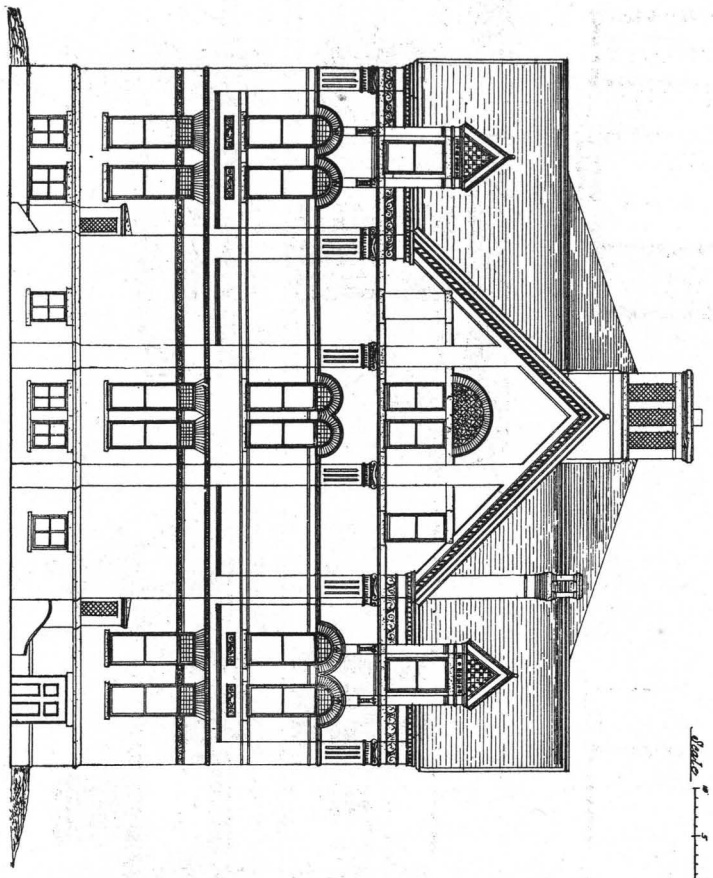




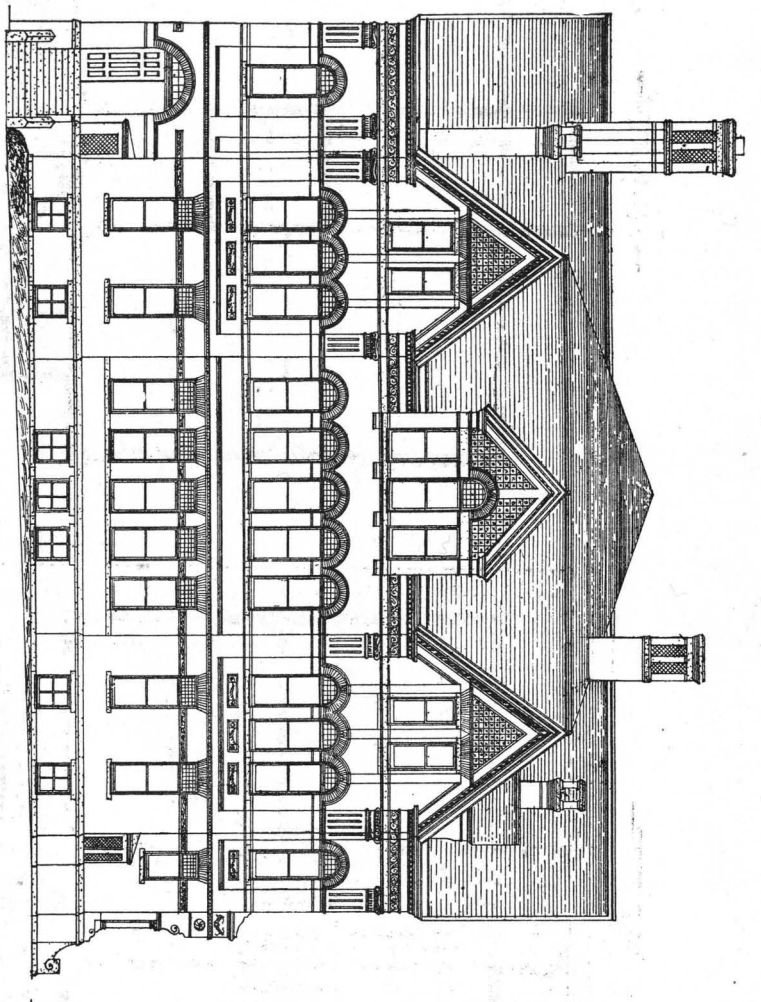
Design for High School Building, Meriden, Conn.

PLATE 60.

REAR ELEVATION

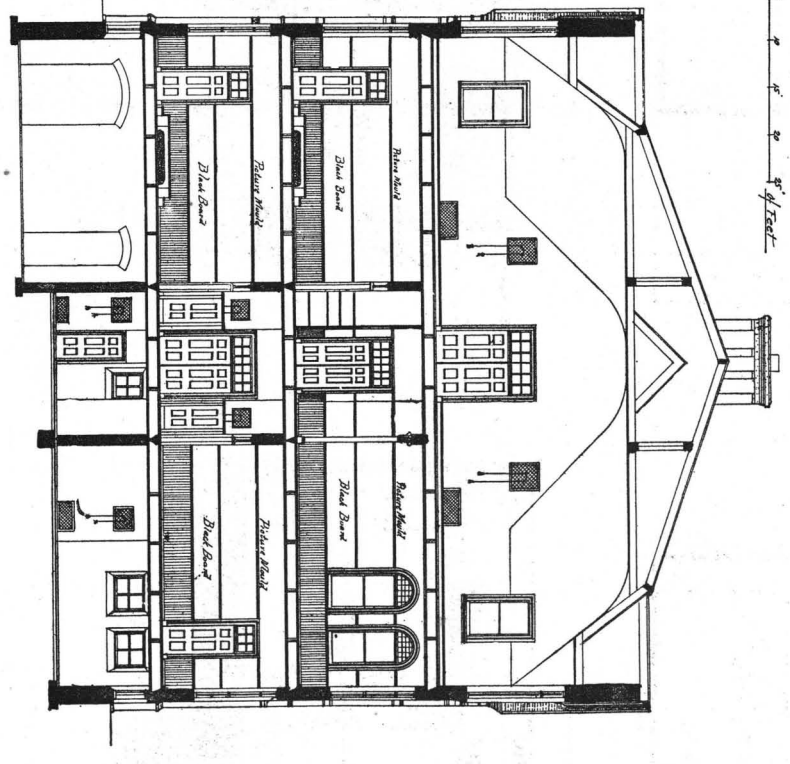


SIDE ELEVATION

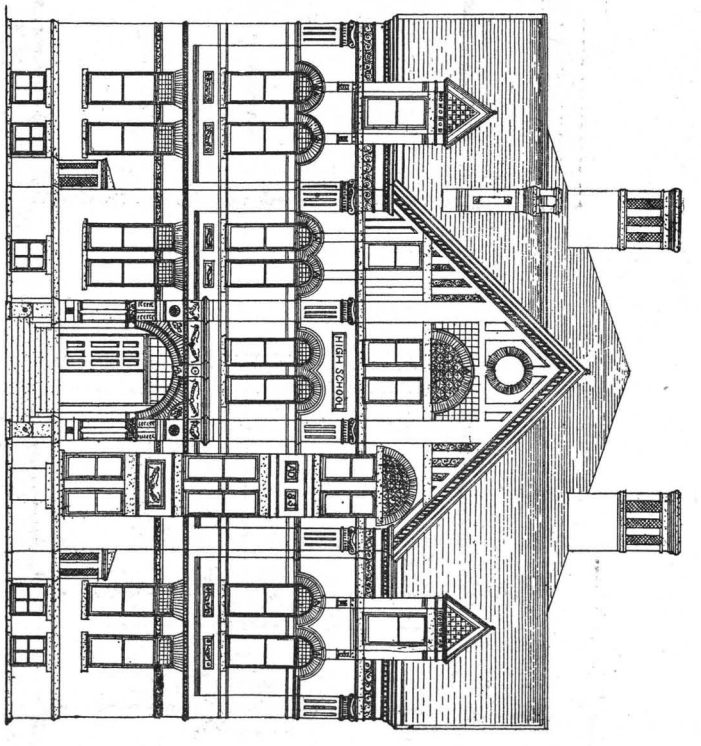


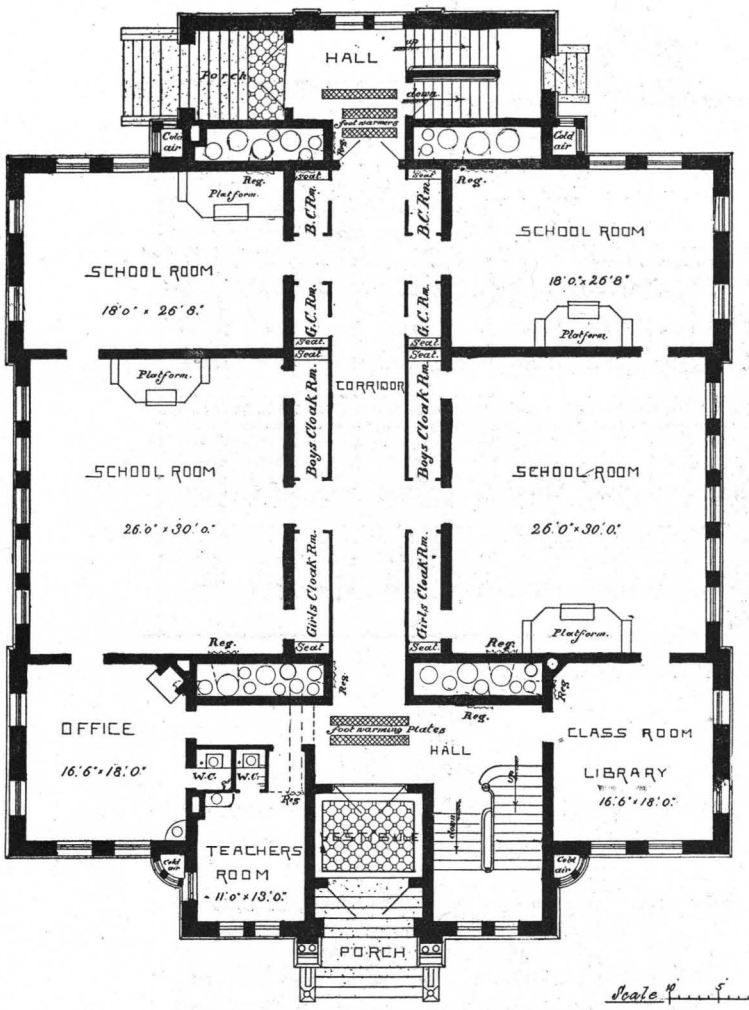
Scale 8 0 8 16 24 32 Feet

CROSS SECTION

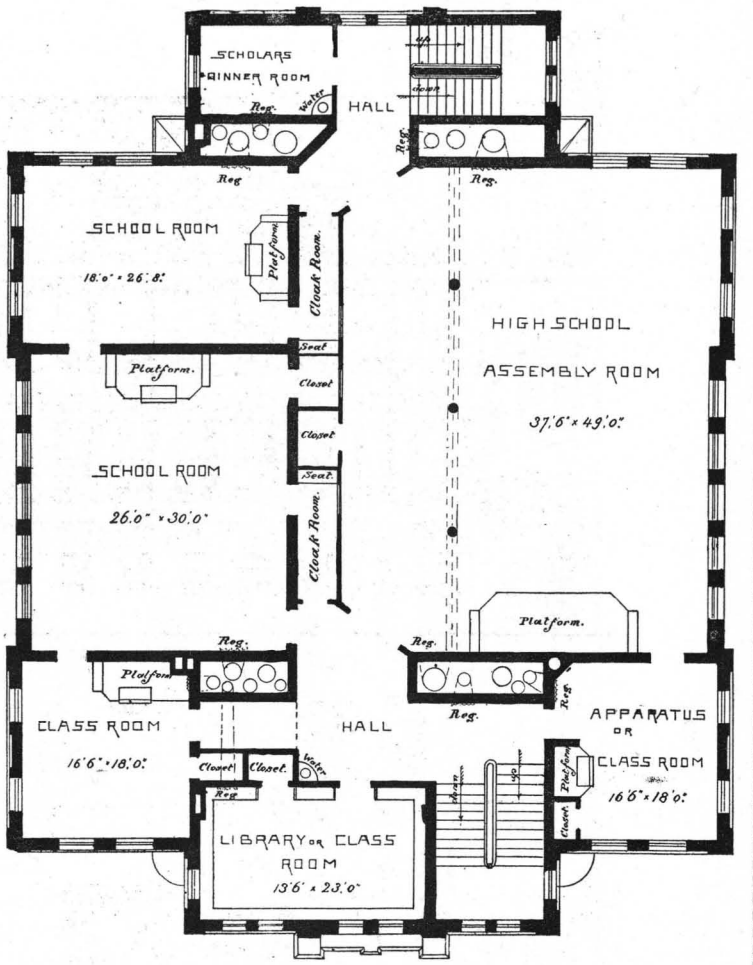


FRONT ELEVATION



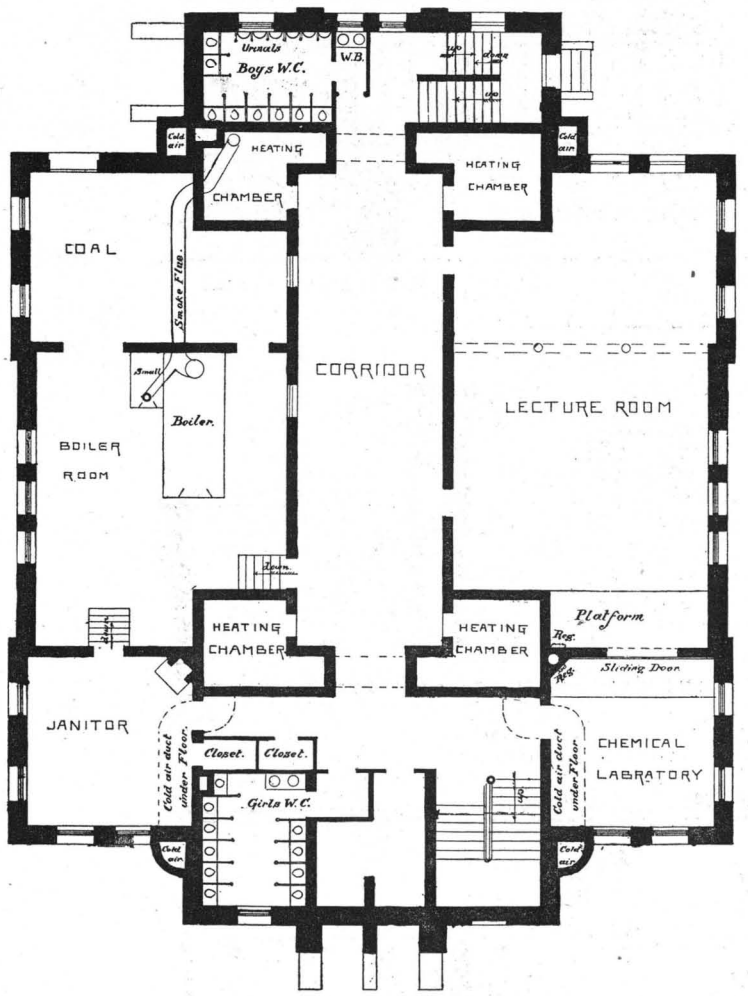


—FIRST FLOOR PLAN—

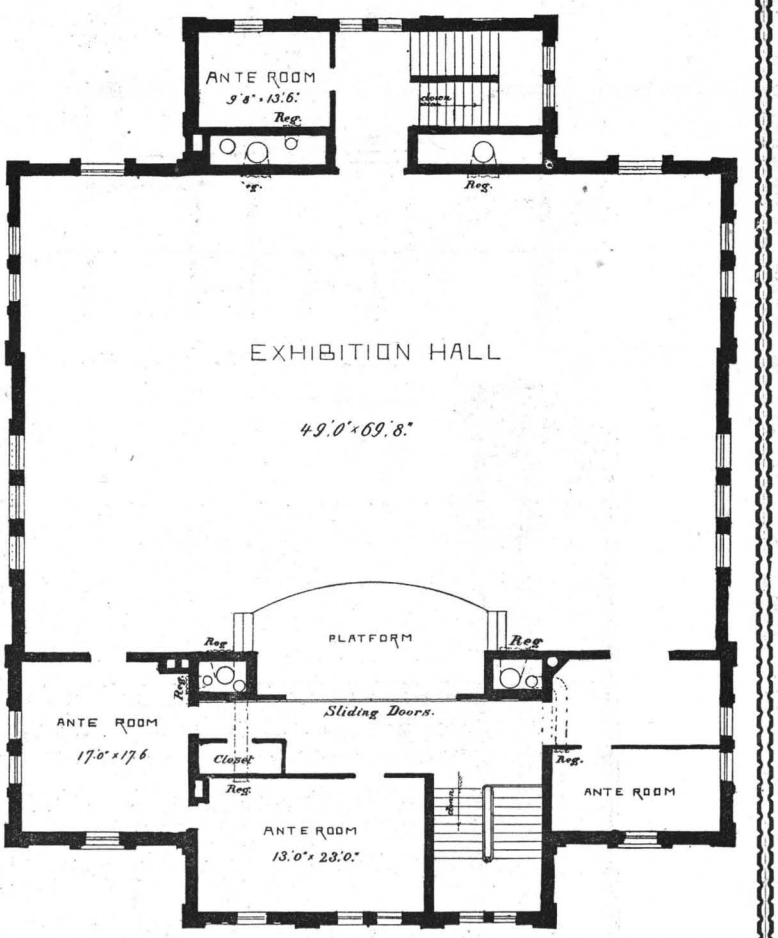


Scale 10 5 0 5 10 15 20 25 of Feet

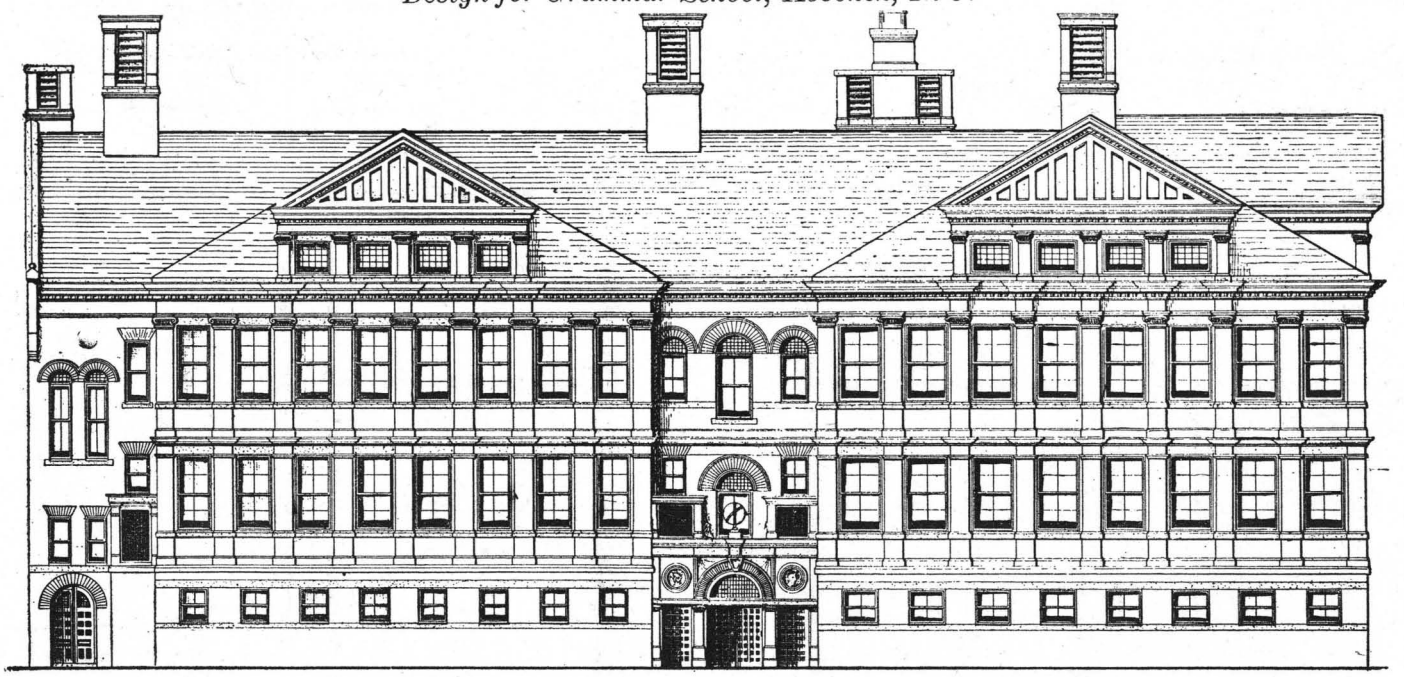
—SECOND FLOOR PLAN—



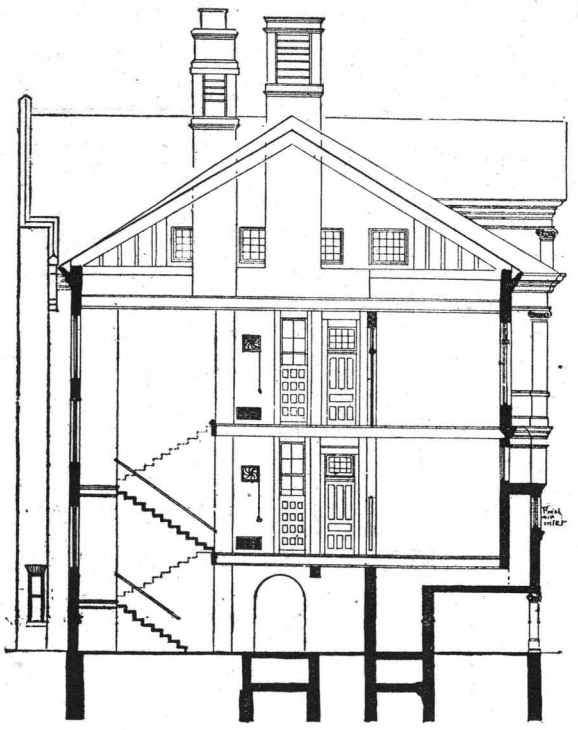
—BASEMENT PLAN—



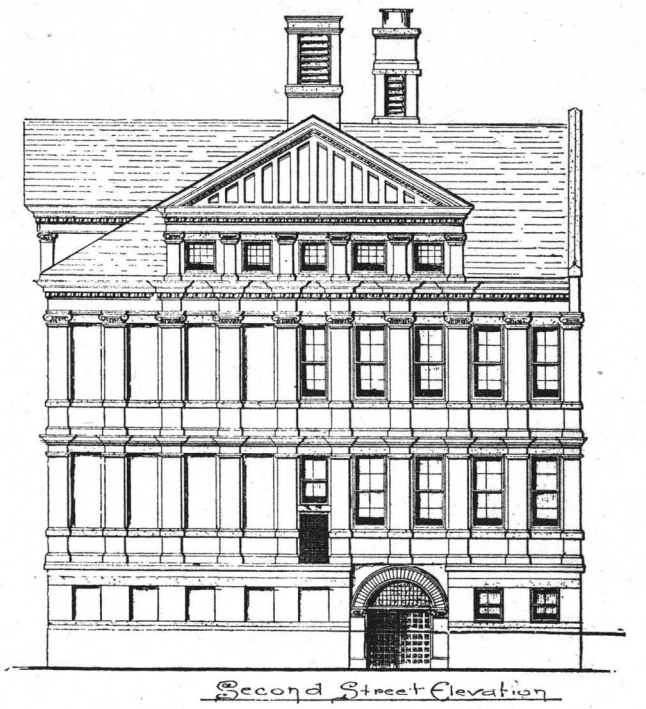
—THIRD FLOOR PLAN—



Clinton Street Elevation

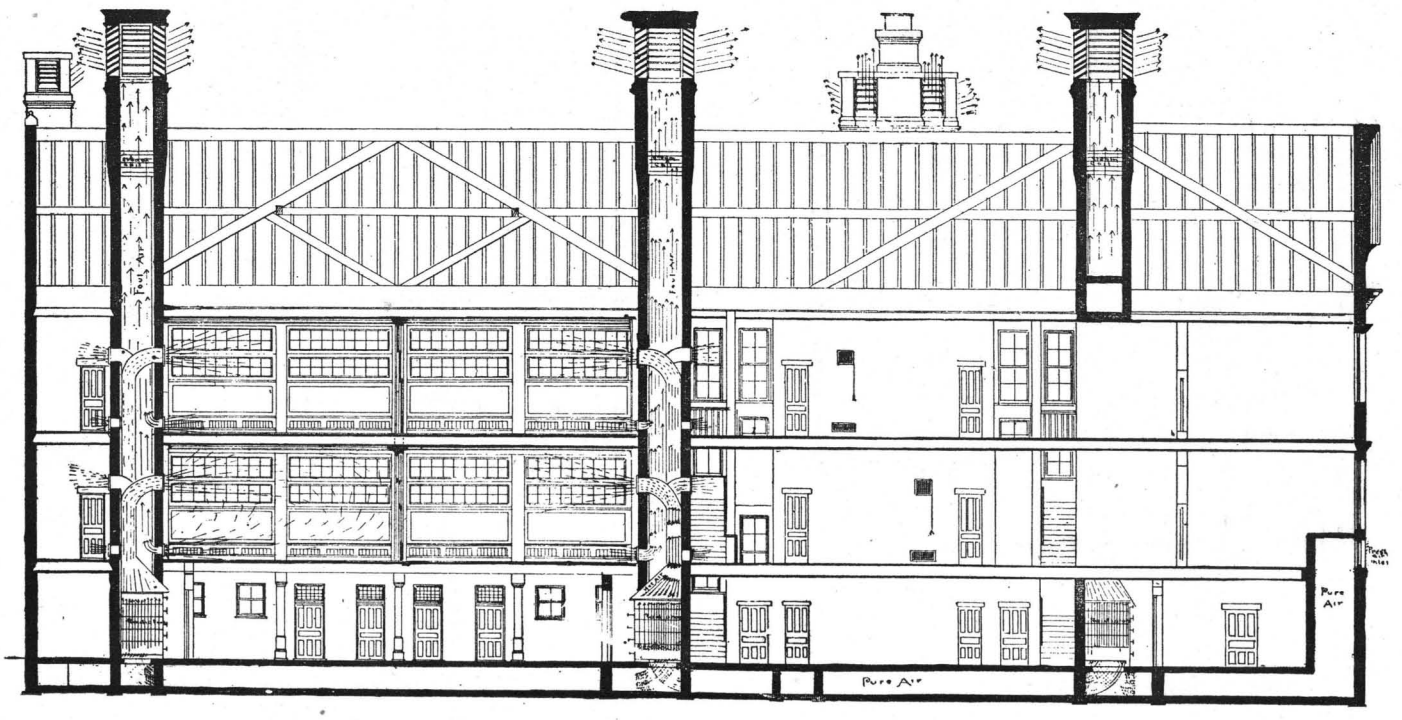


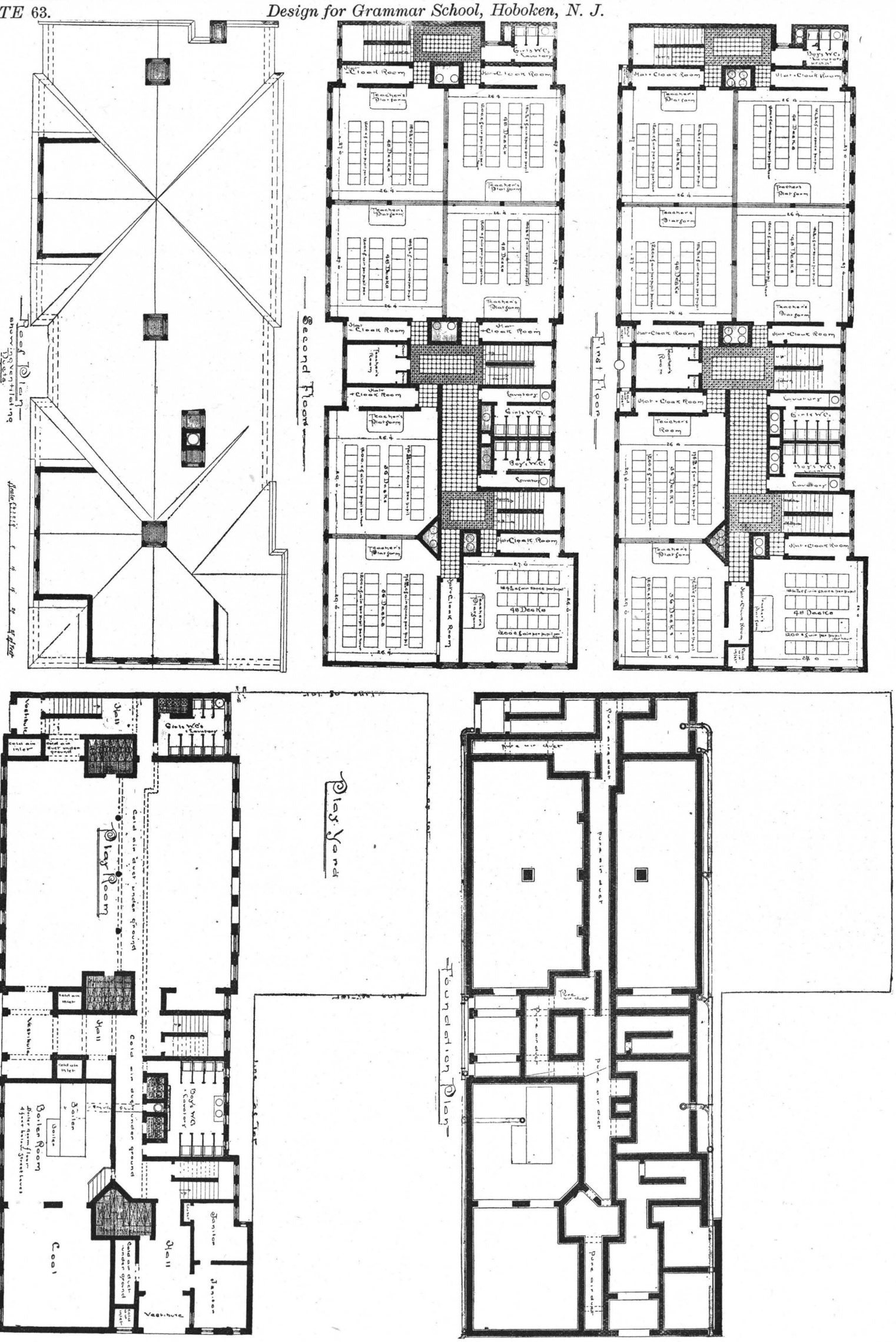
Transverse Section

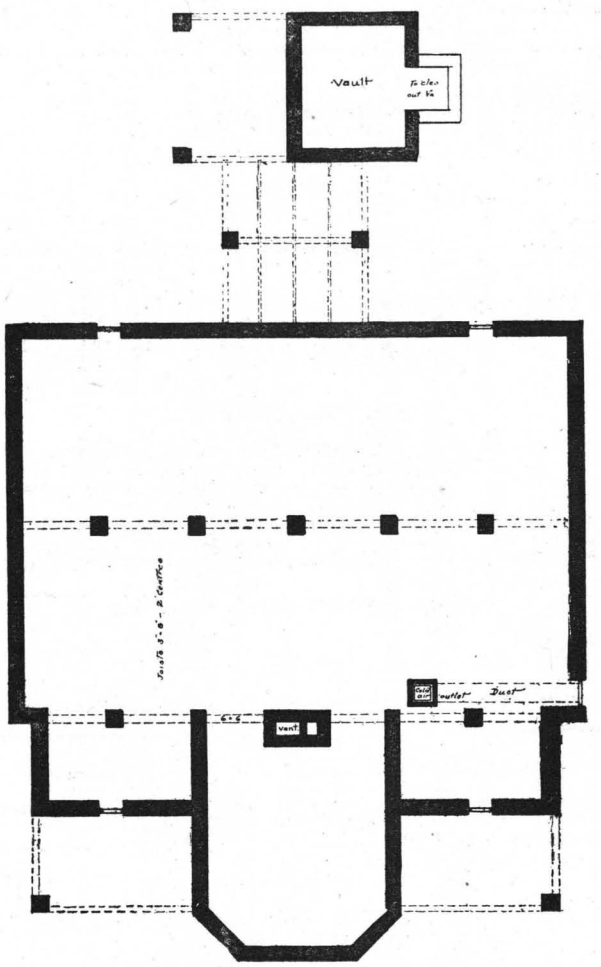


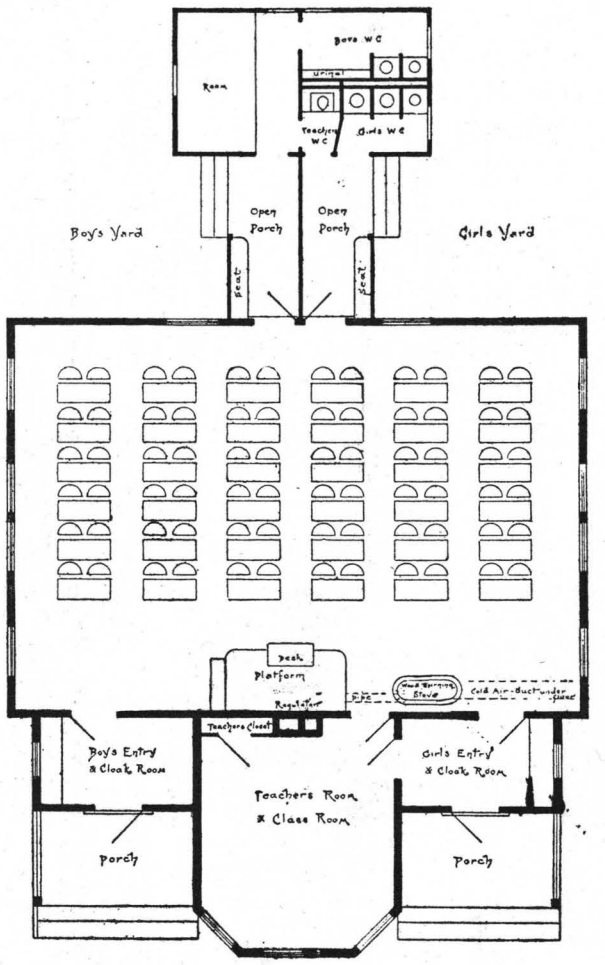
Second Street Elevation

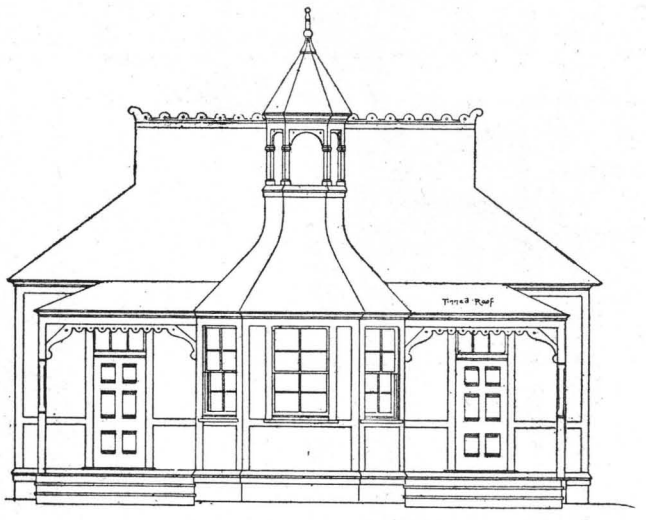
Scale 0 4 8 12 16 20 25 of Feet





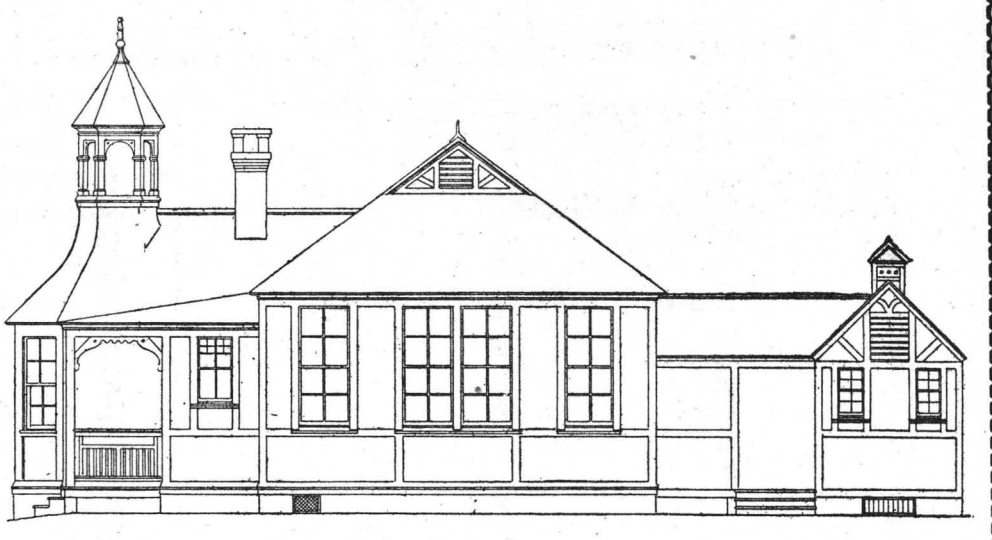




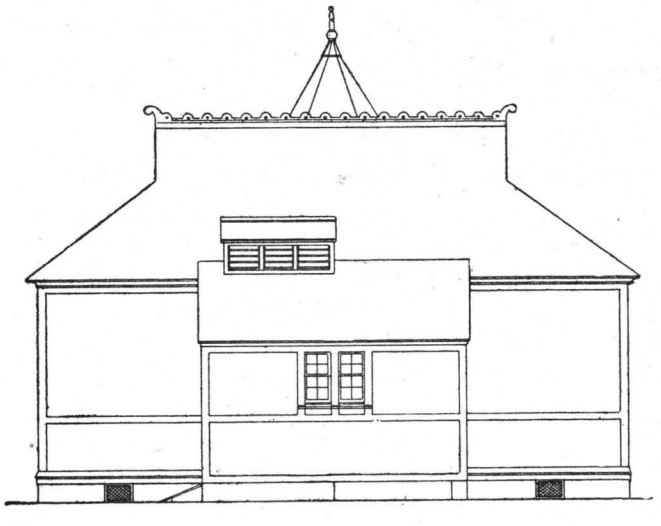


FRONT ELEVATION

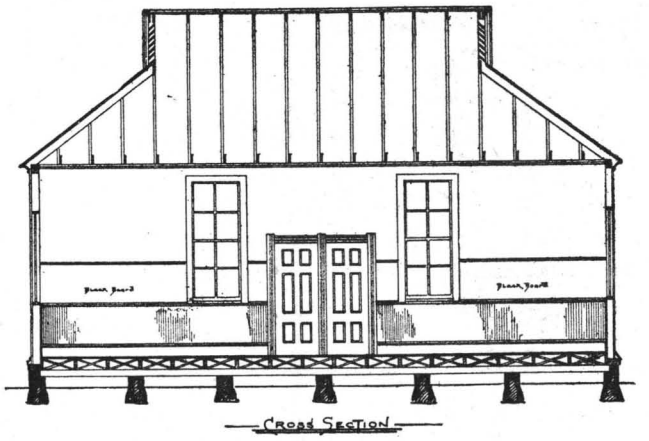
Scale 1/8" 1' 2' 4' 8' 12' 16' 24' 32' of Feet



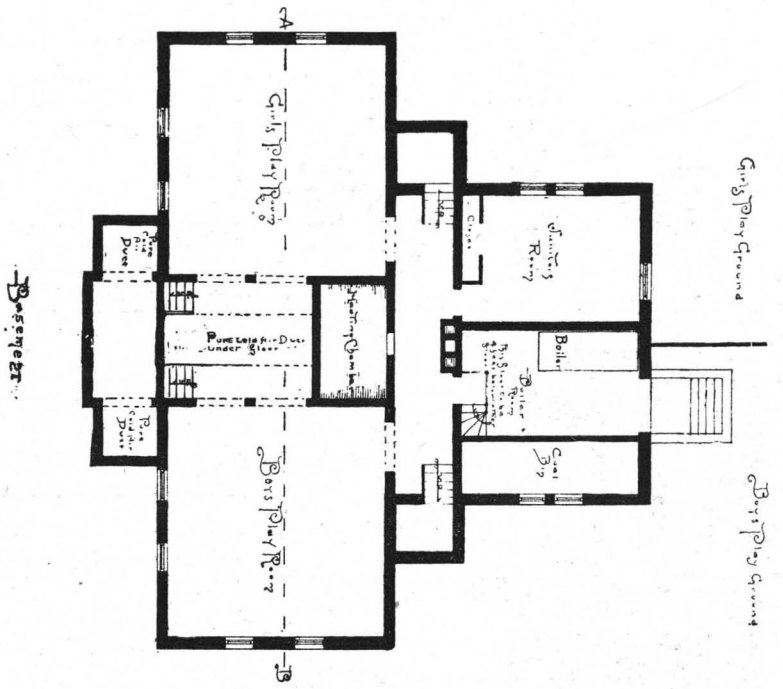
SIDE ELEVATION

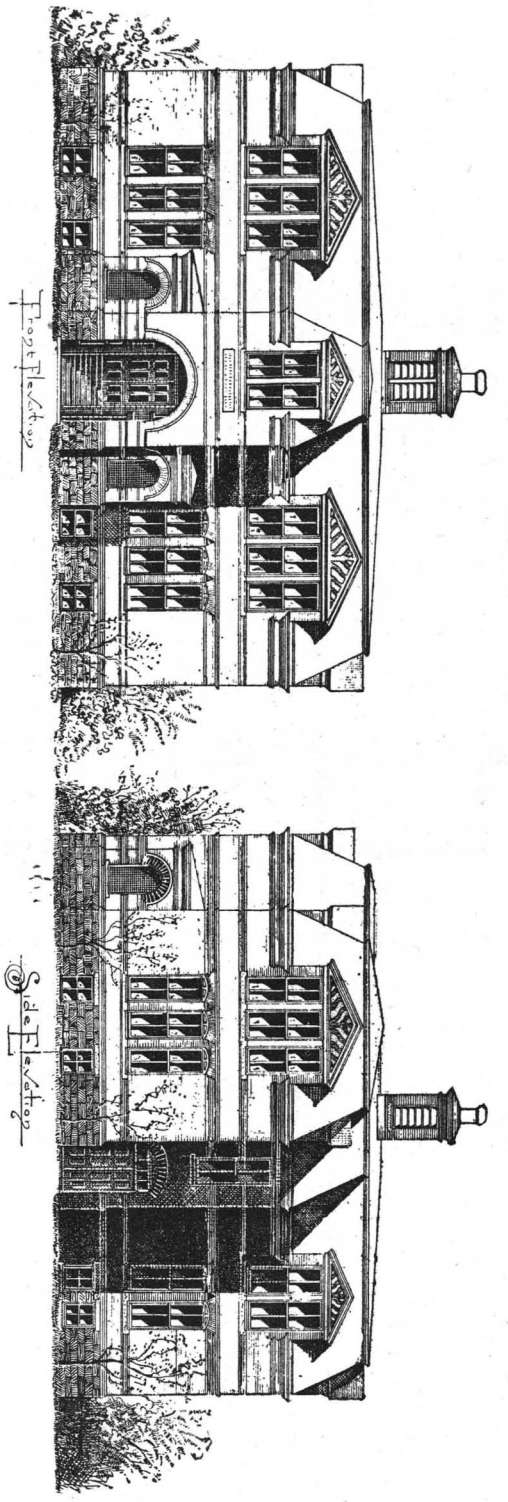


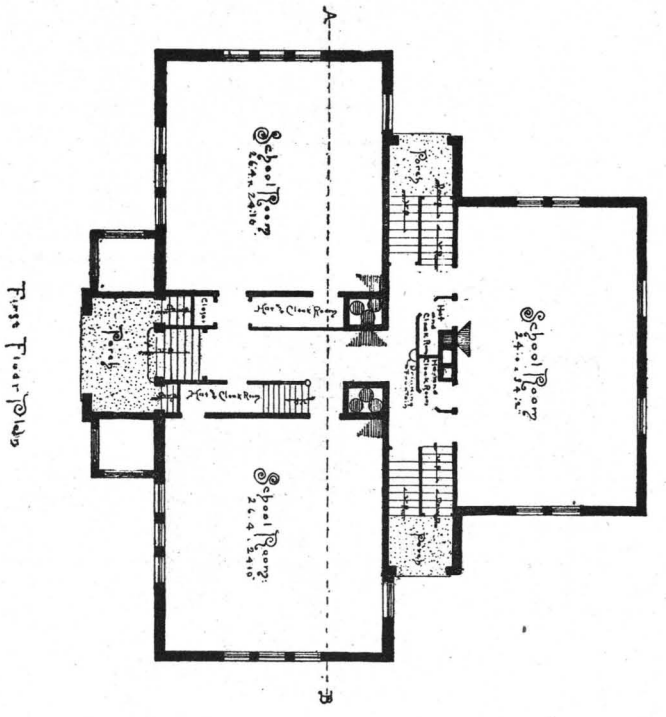
REAR ELEVATION

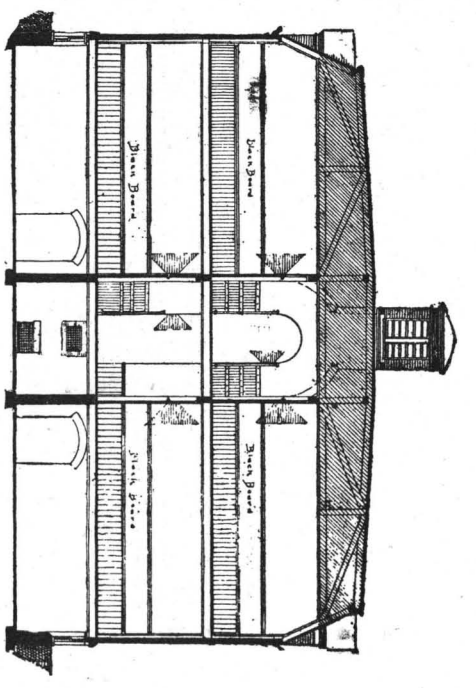


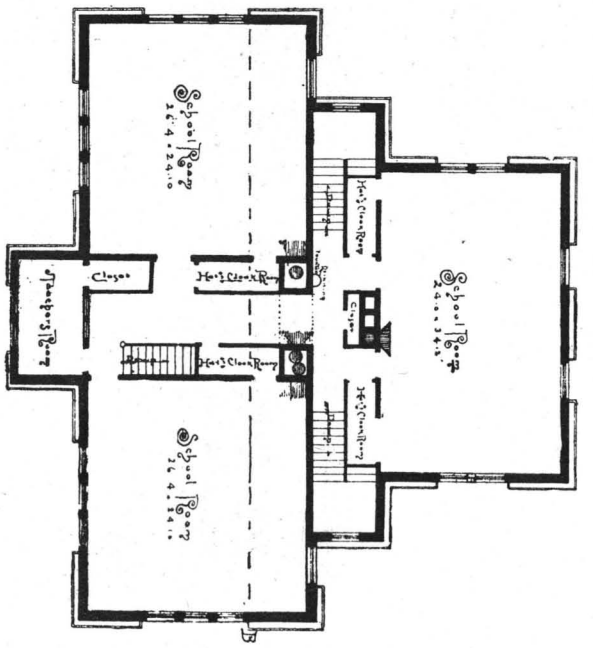
CROSS SECTION



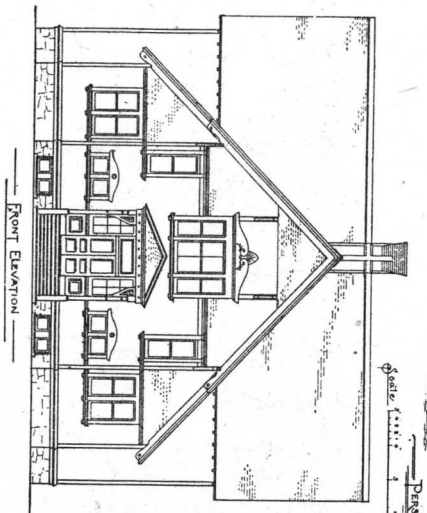


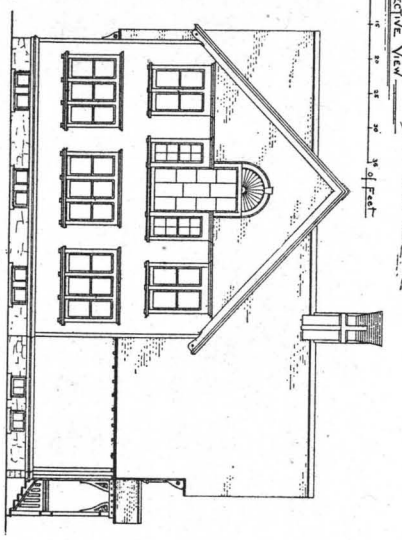


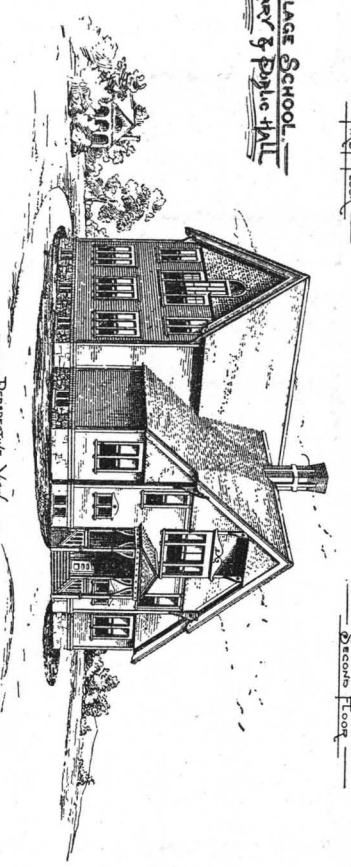


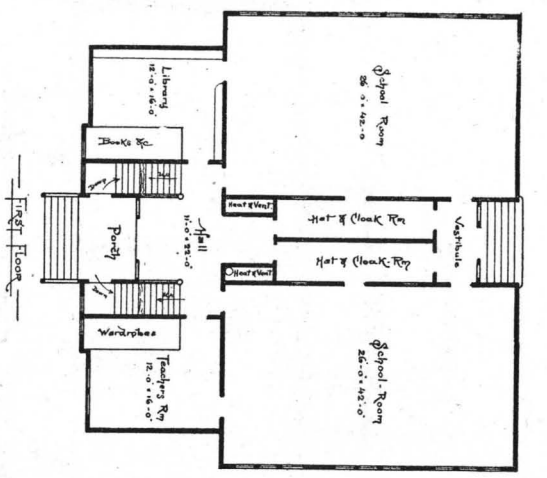


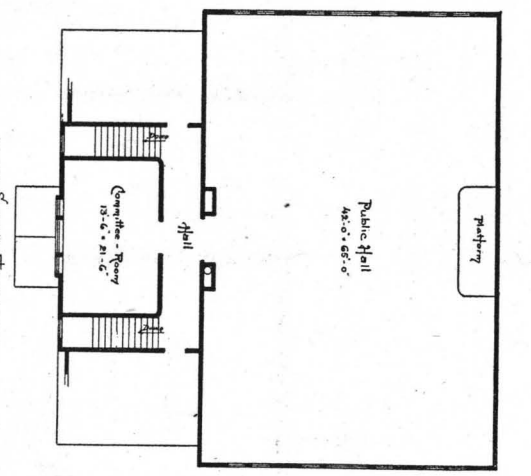
VILLAGE SCHOOL, LIBRARY & PUBLIC HALL



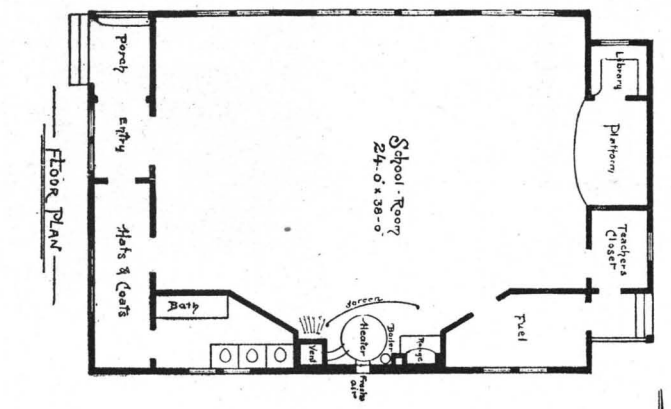


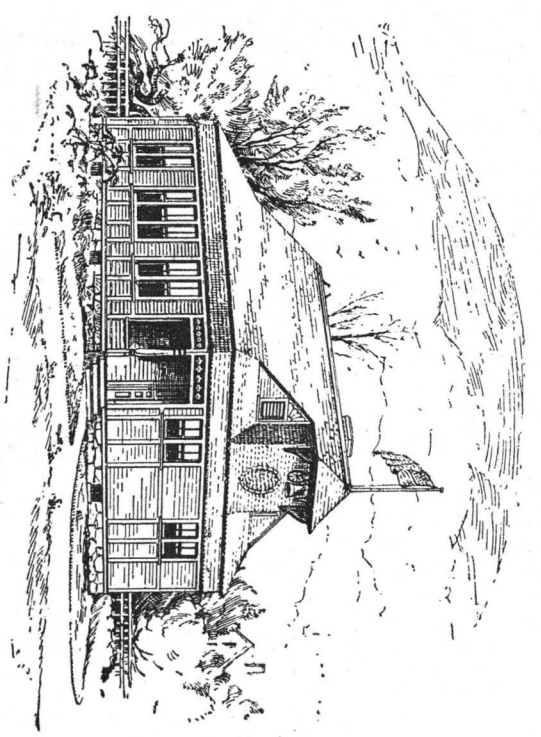


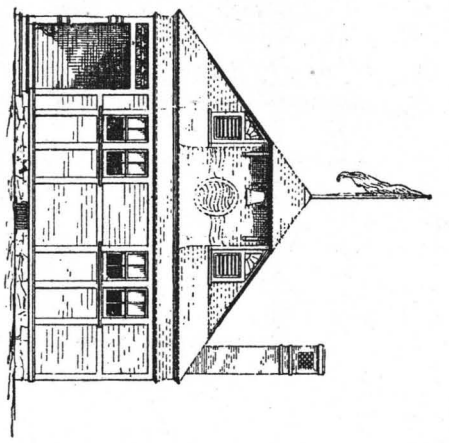


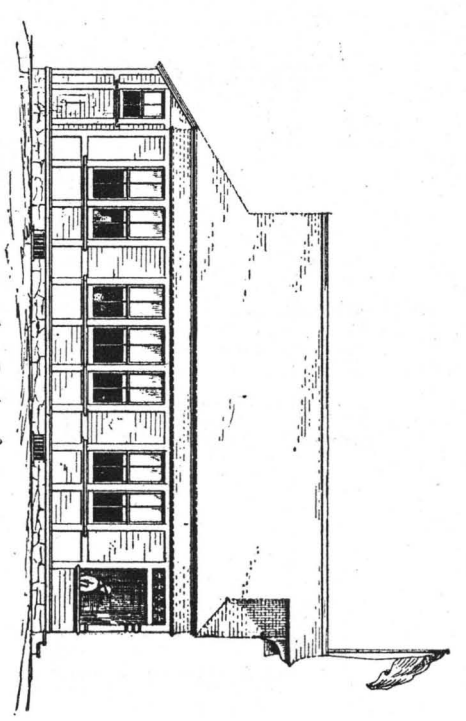


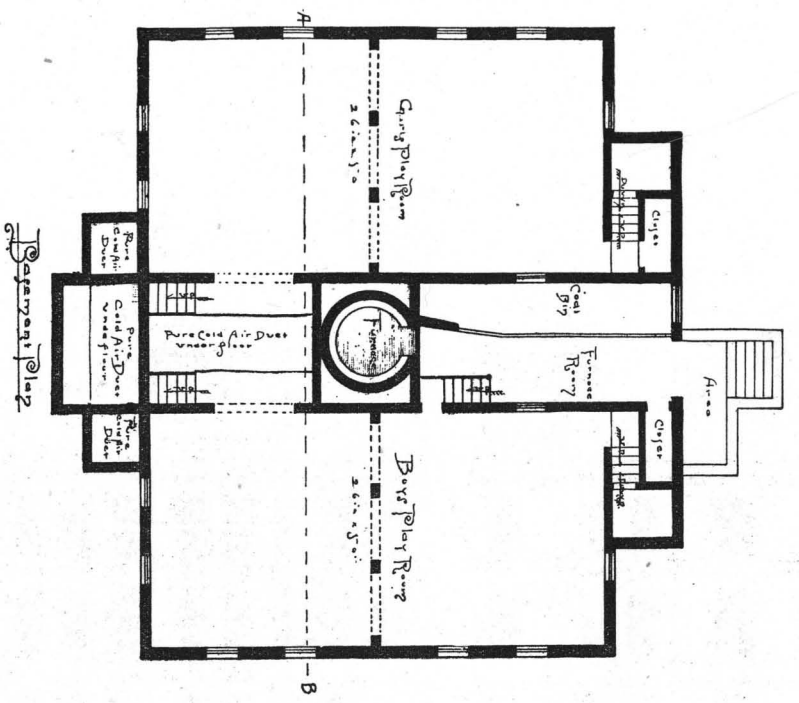
KINDERGARTEN

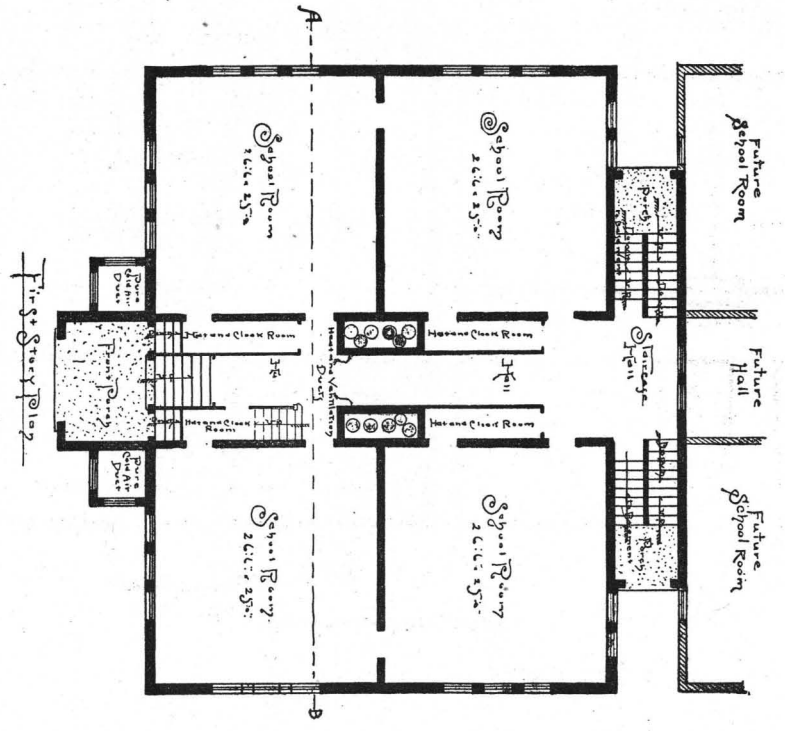


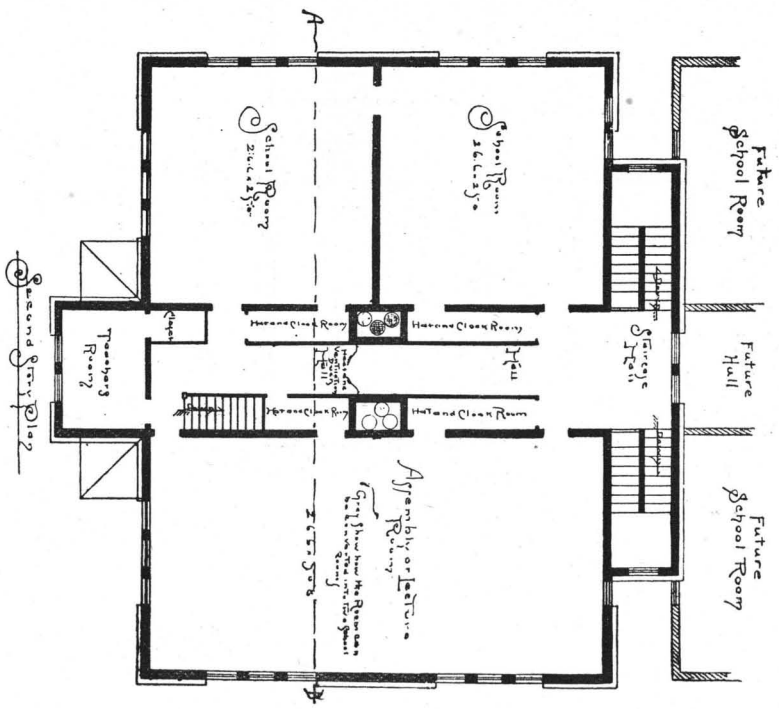


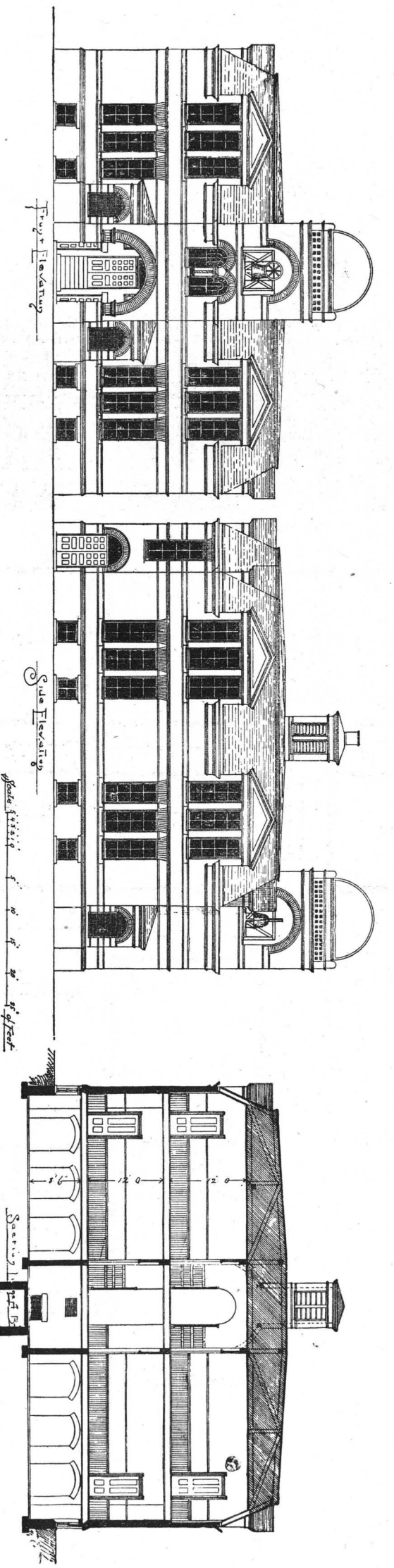


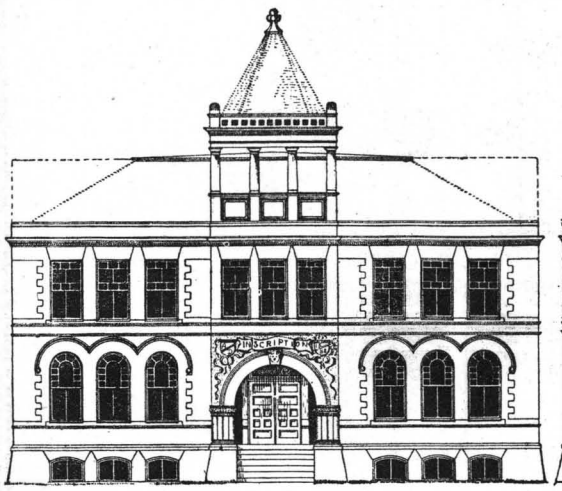




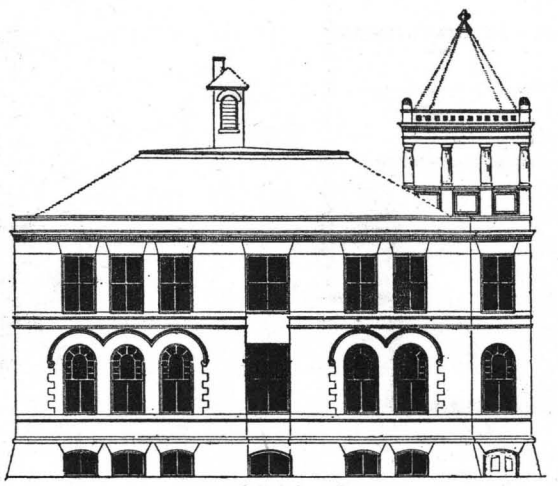




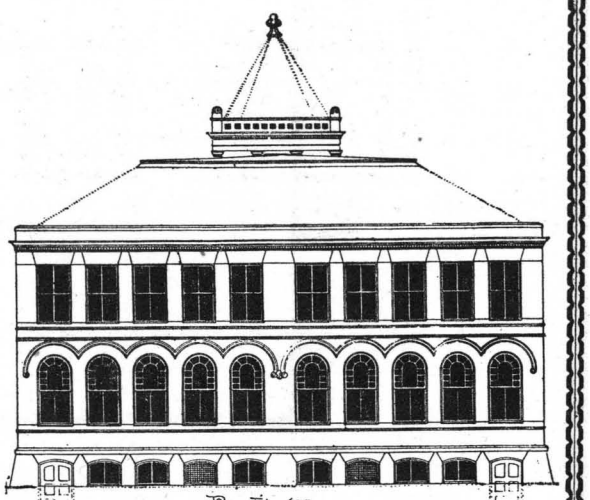




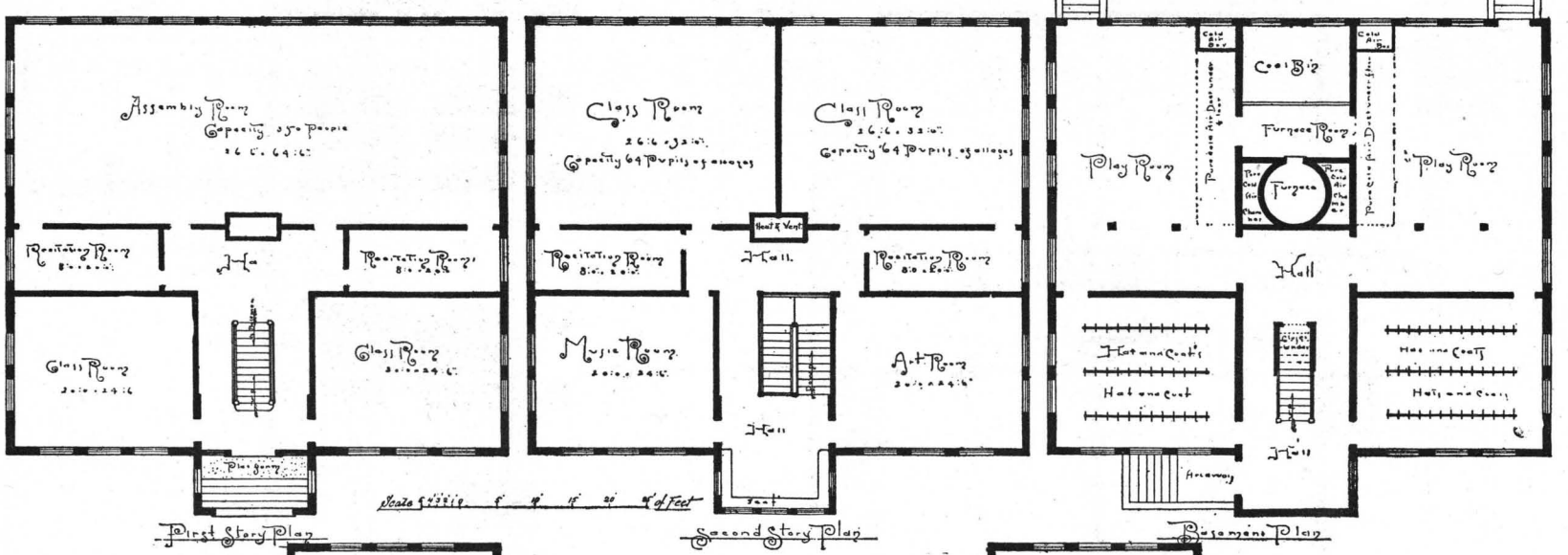
Front Elevation

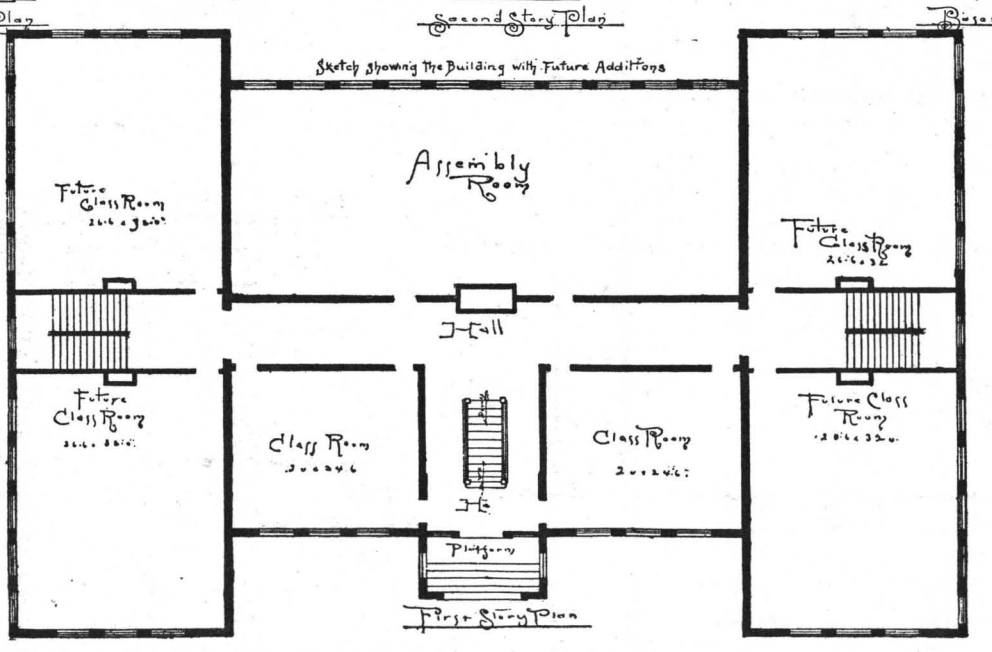


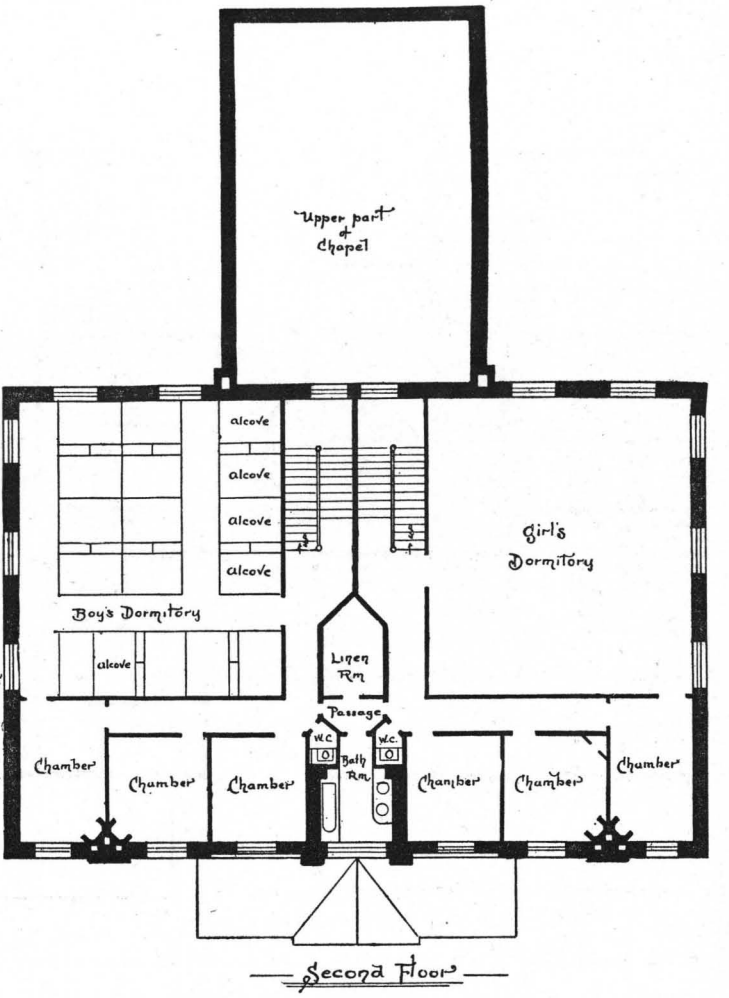
Side Elevation

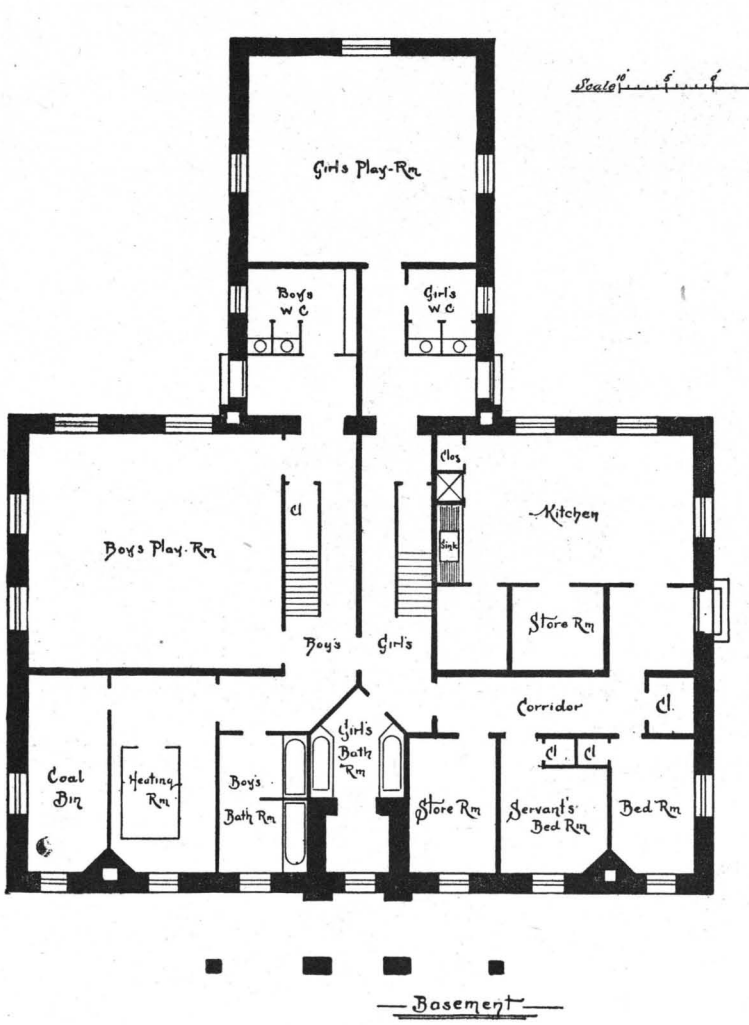


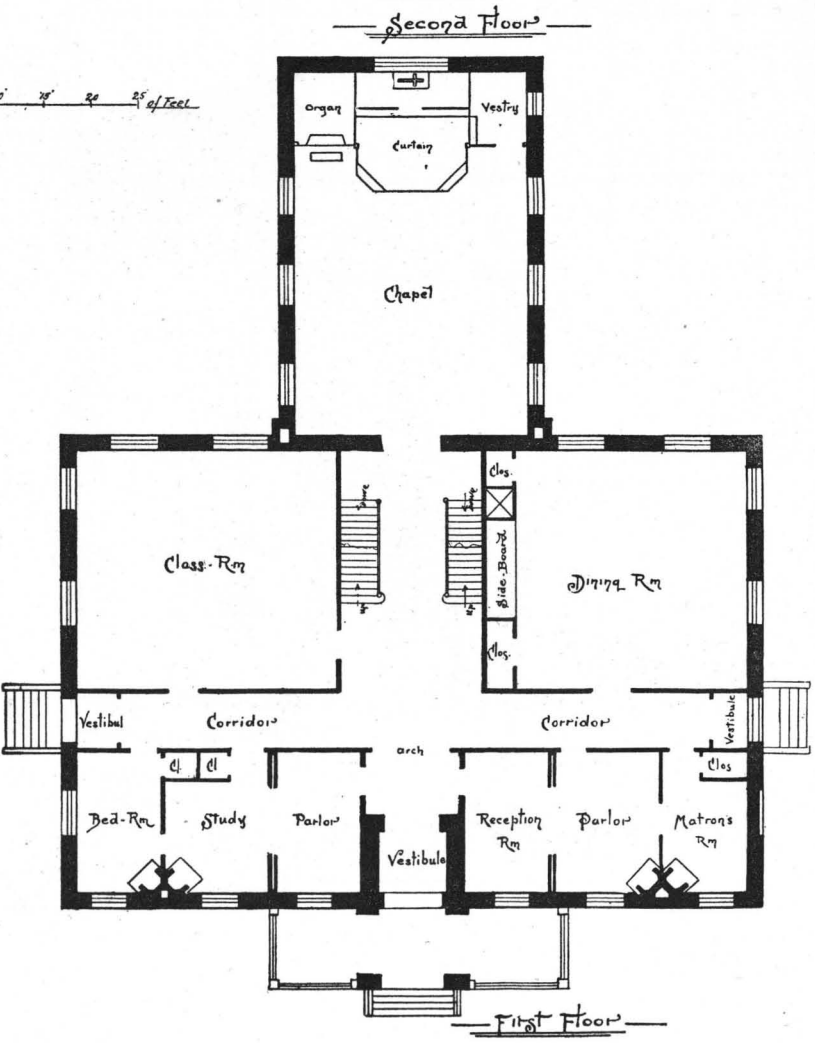
Rear Elevation

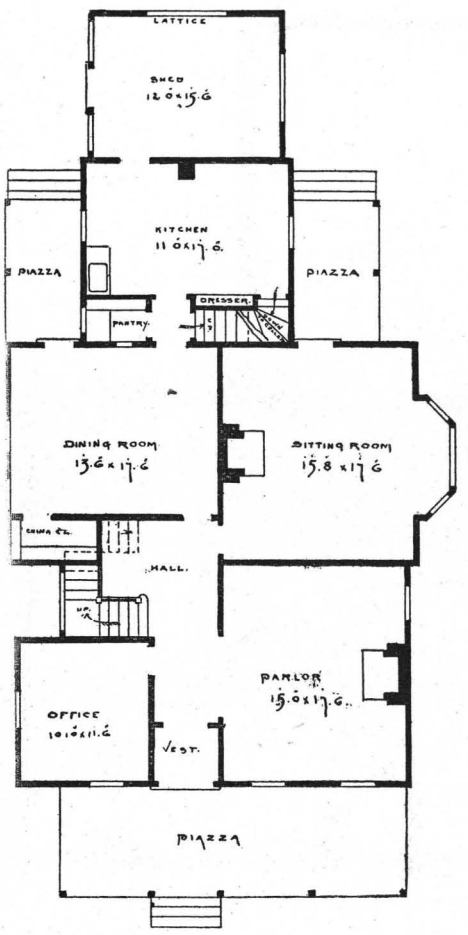




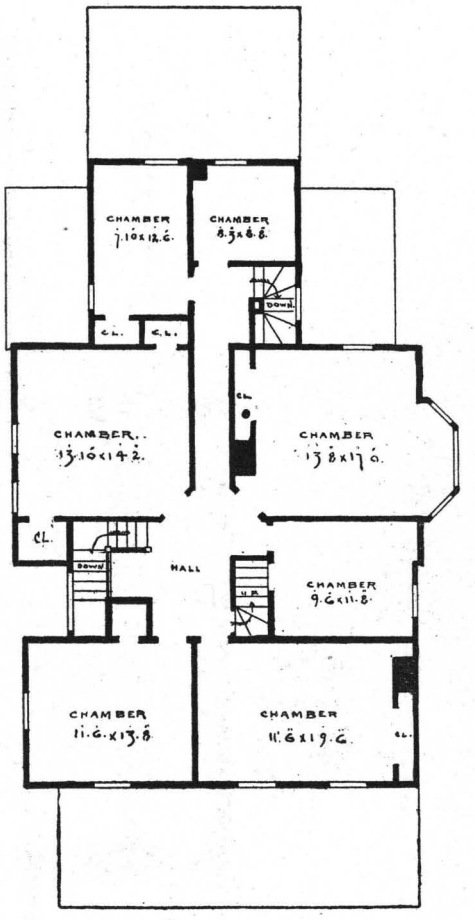




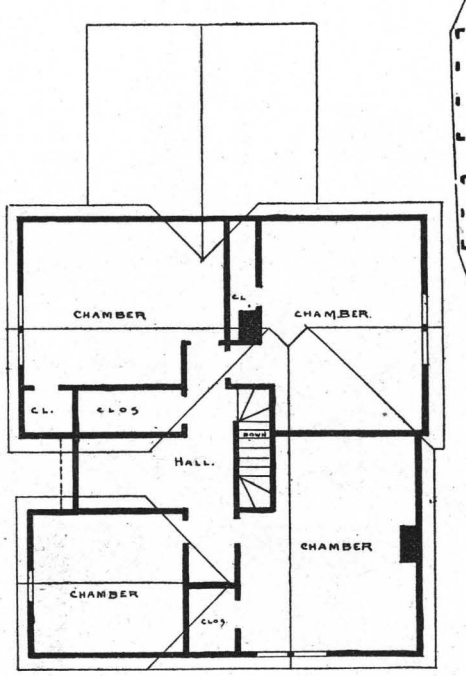




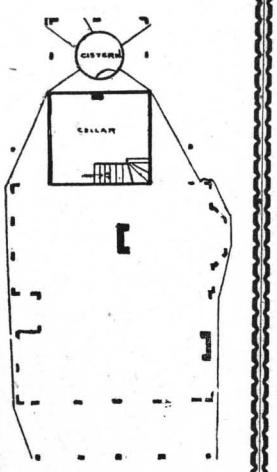
First Floor



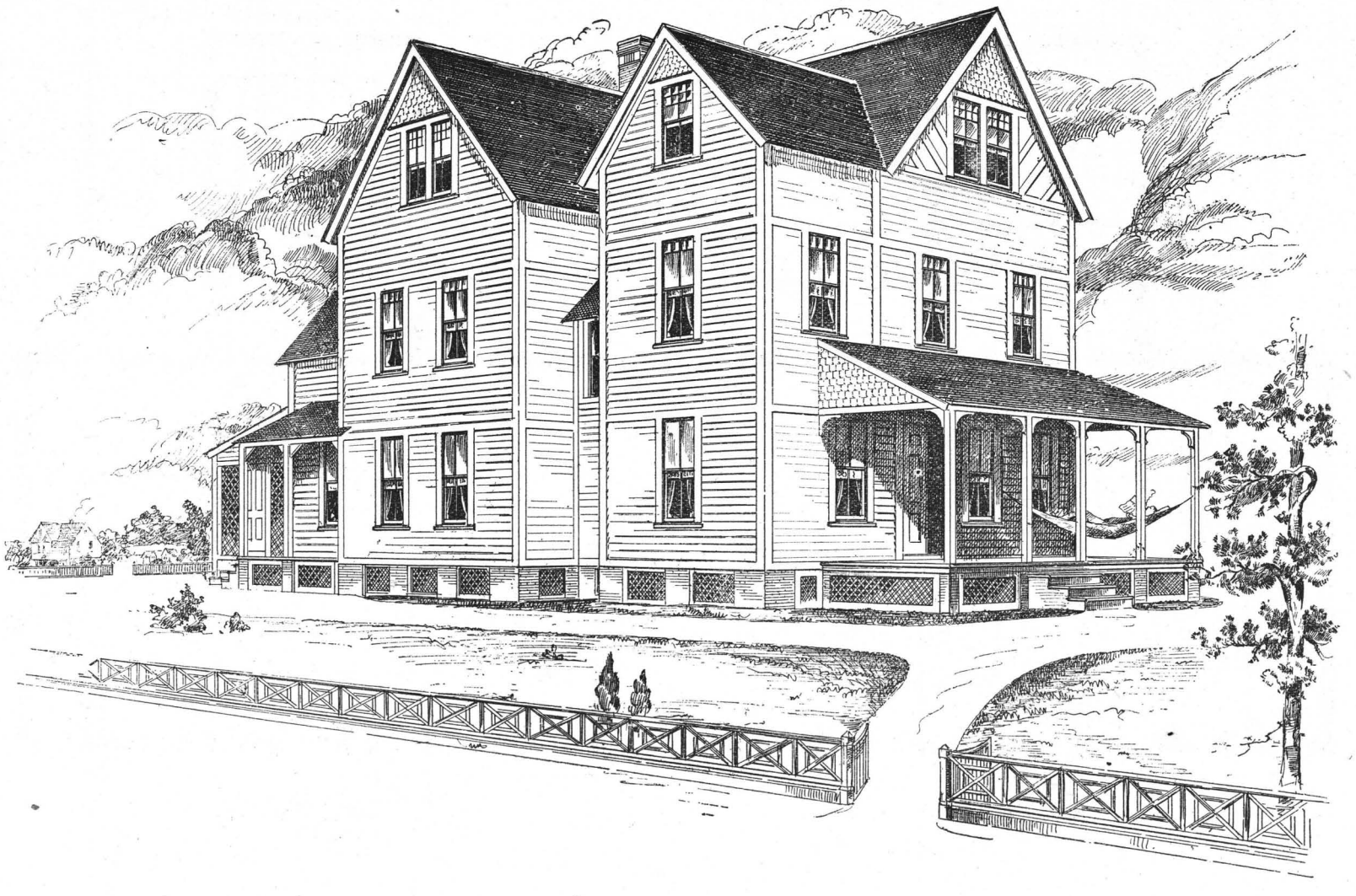
Second Floor



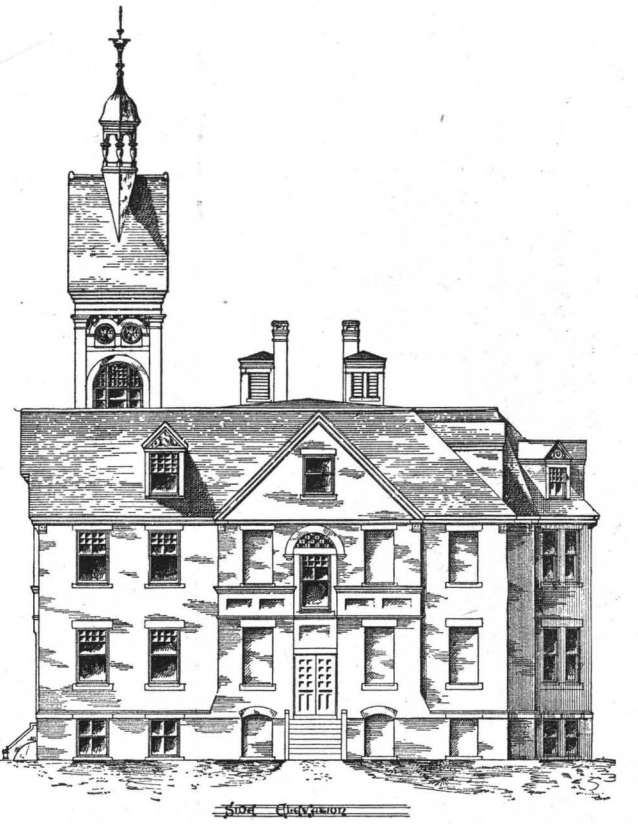
Attic 1/8 Roof Plan



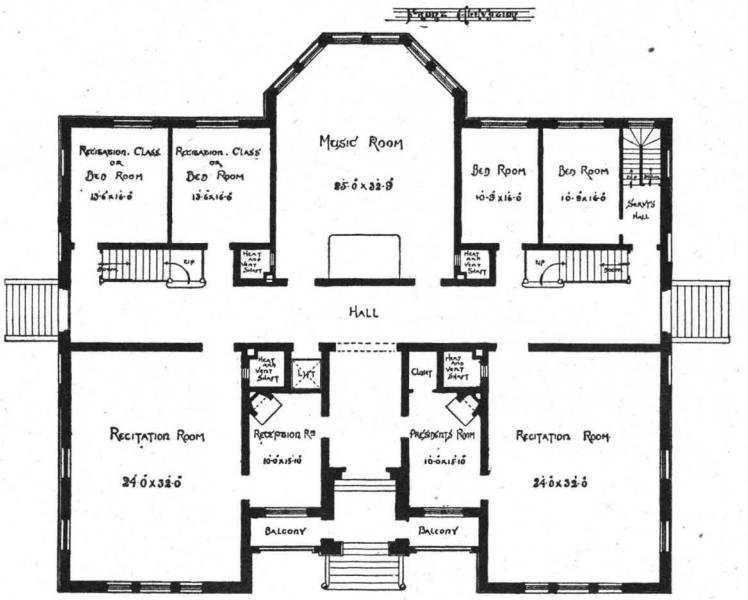
Foundation Plan.



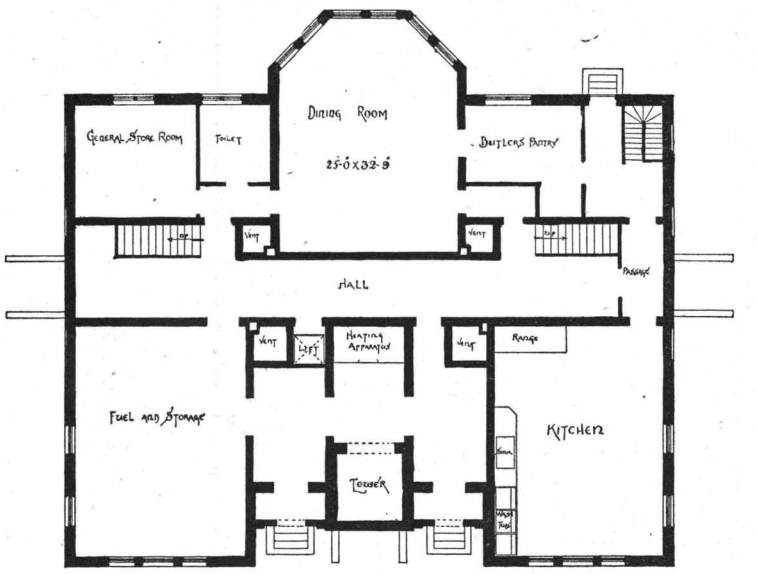
Front Elevation



Side Elevation

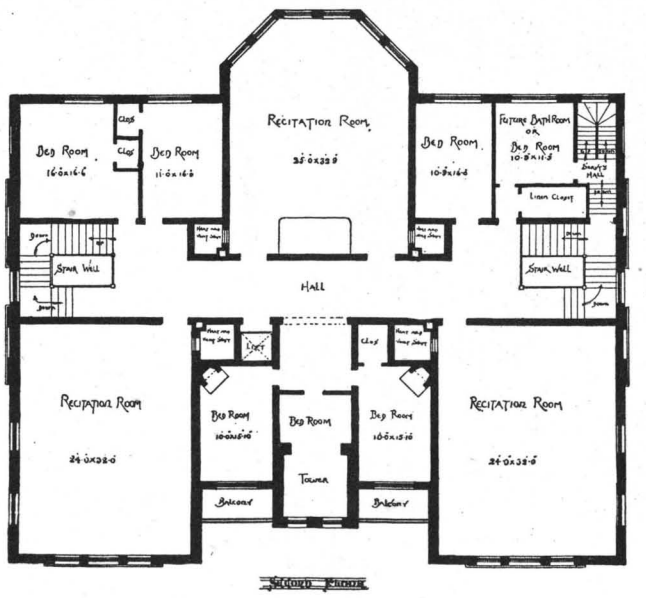


First Floor

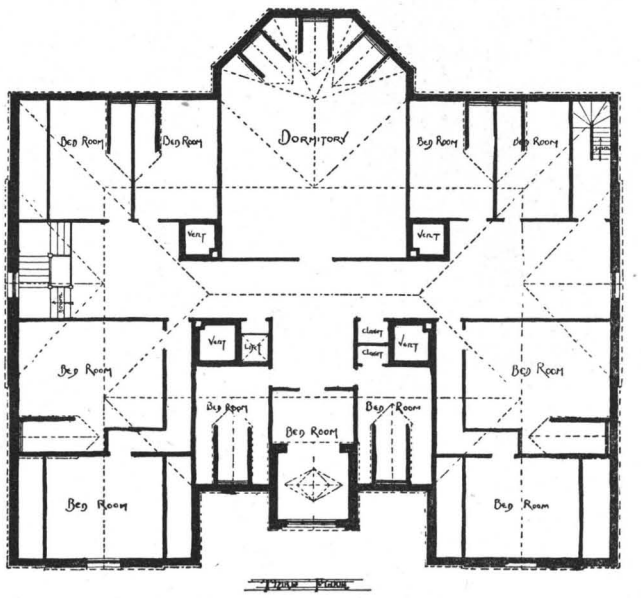


Basement Plan

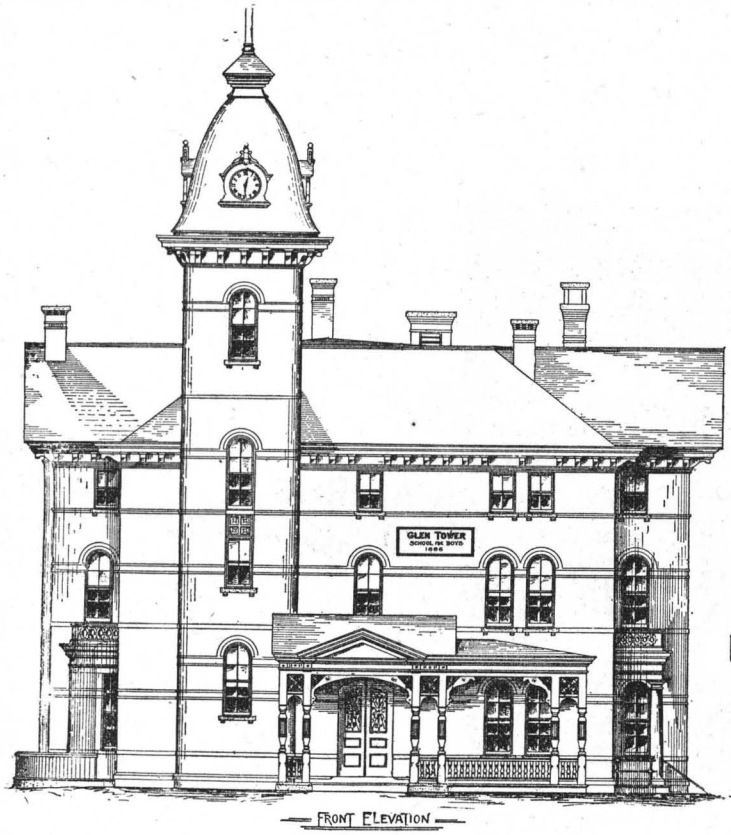
Scale 1/8" = 1 Foot



Second Floor



Third Floor



FRONT ELEVATION

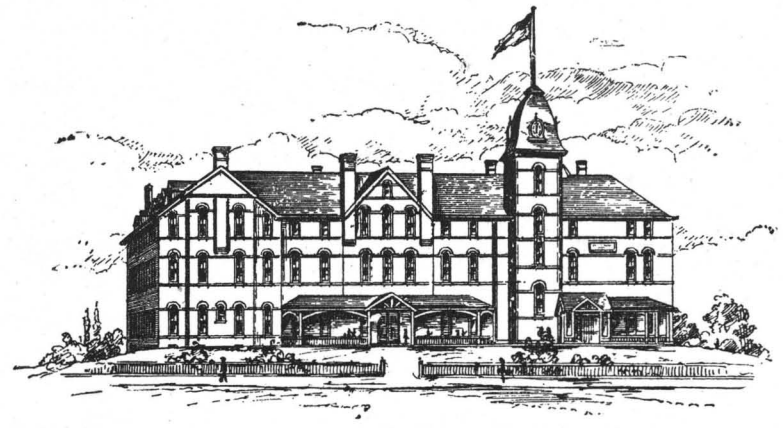
Old House

NORTH SIDE ELEVATION

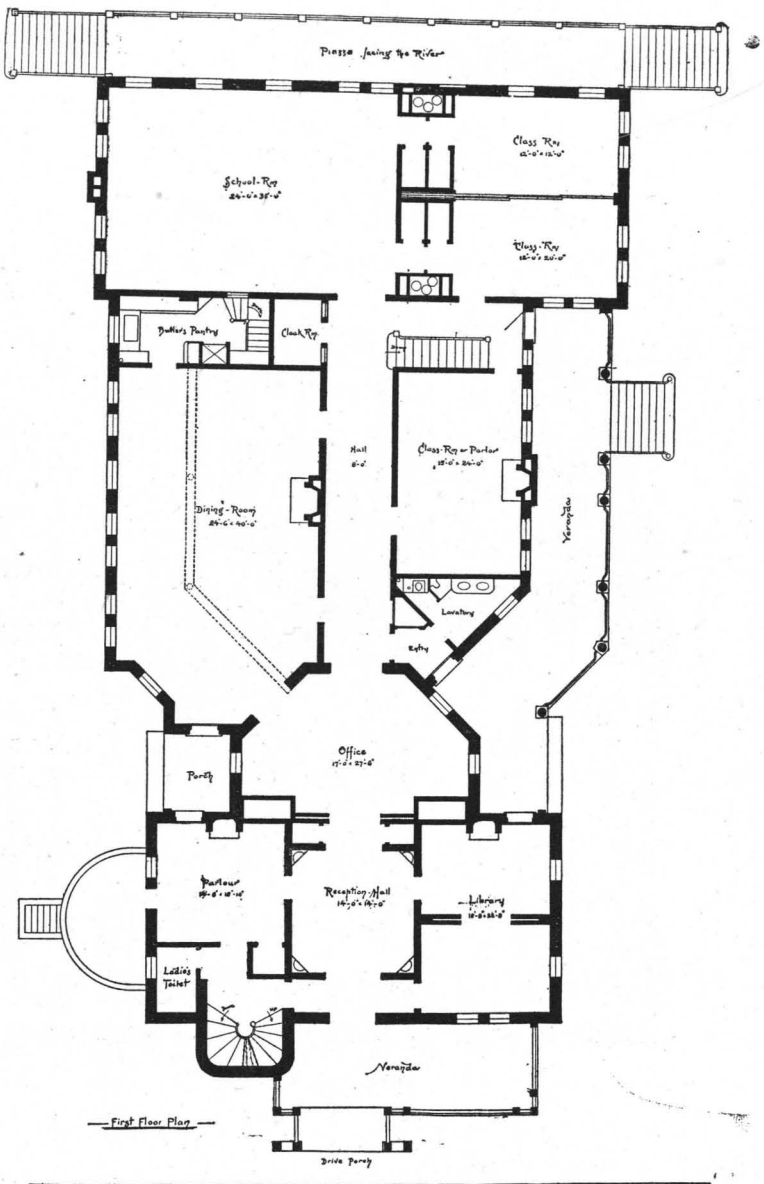
Glen Tower School for Boys at Dobbs Ferry, N. Y.—Made Out Of an Old Style House.

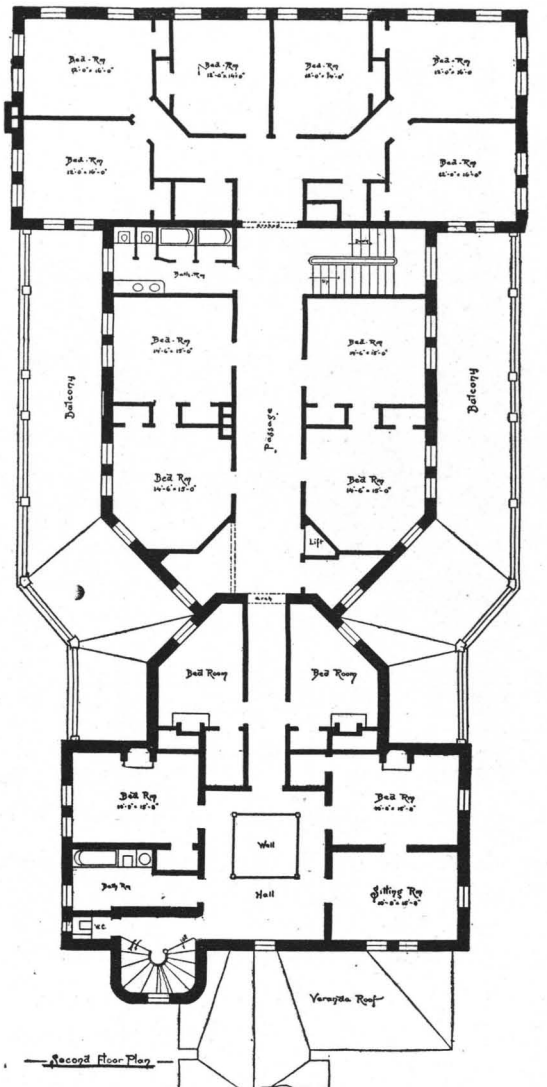
The Elevations above show an Old House added to and remodeled into a Military and Boarding School for Boys, and used as a Hotel during the Summer vacation months.

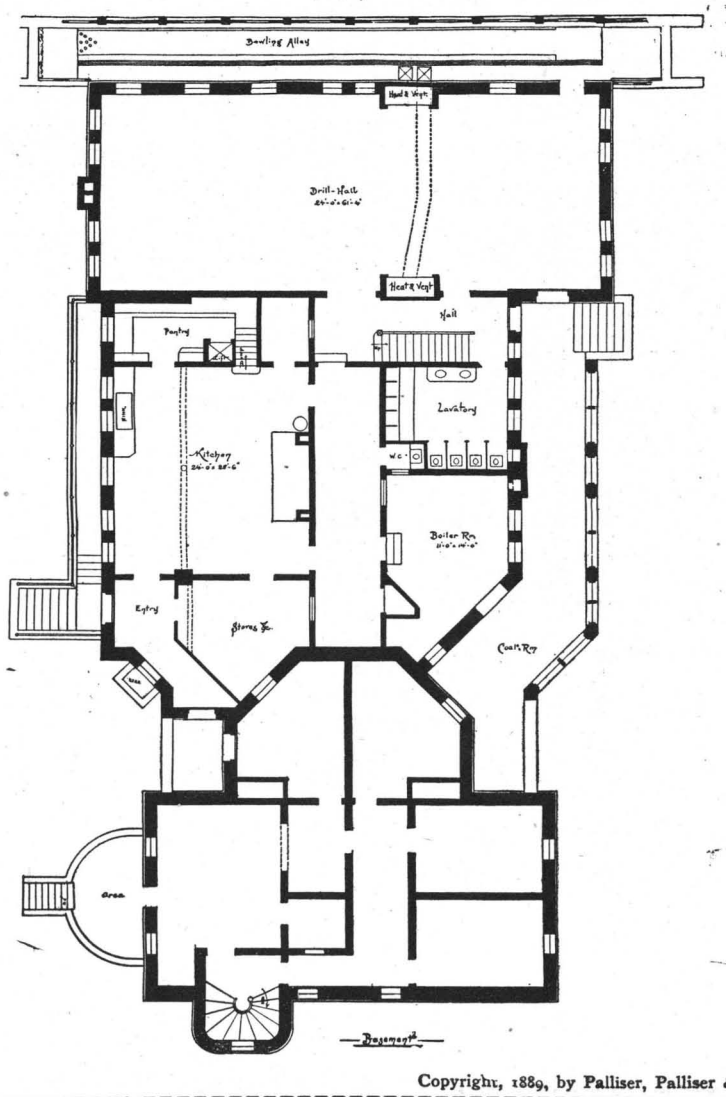
Sketch showing North-east View, with latest additions.

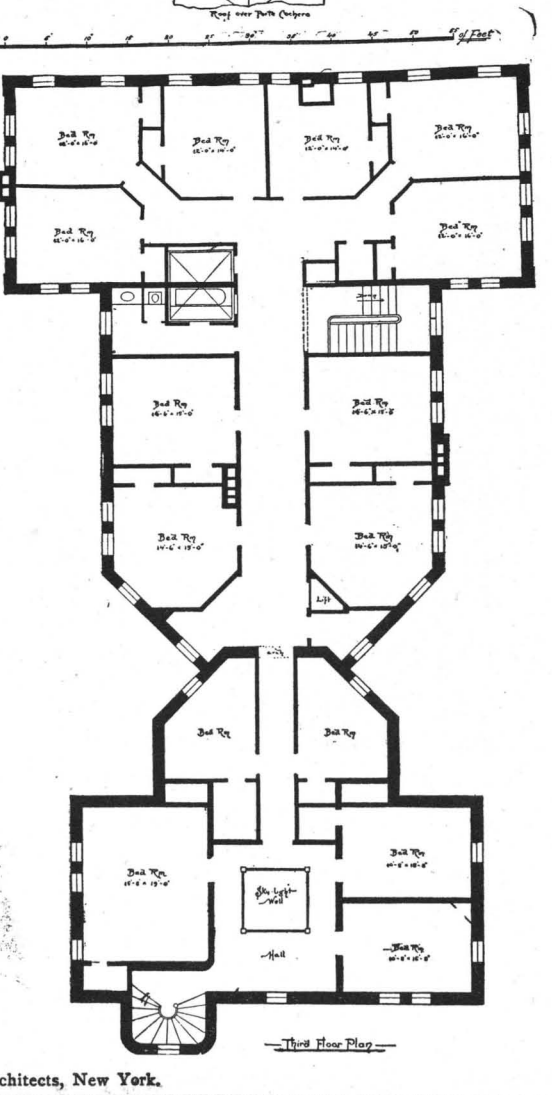


Sketch of East or Street Front, showing later additions made to meet Requirements of its Patronage.



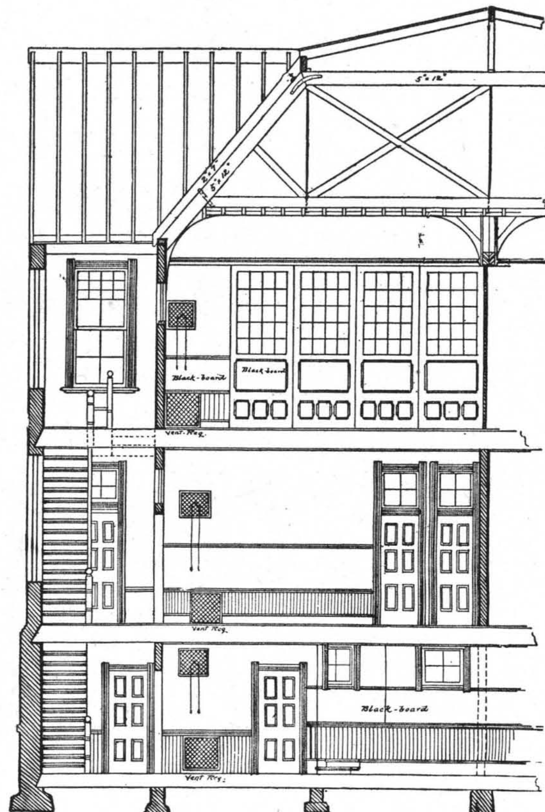






St. Johns Parochial School at Jersey City, N. J.

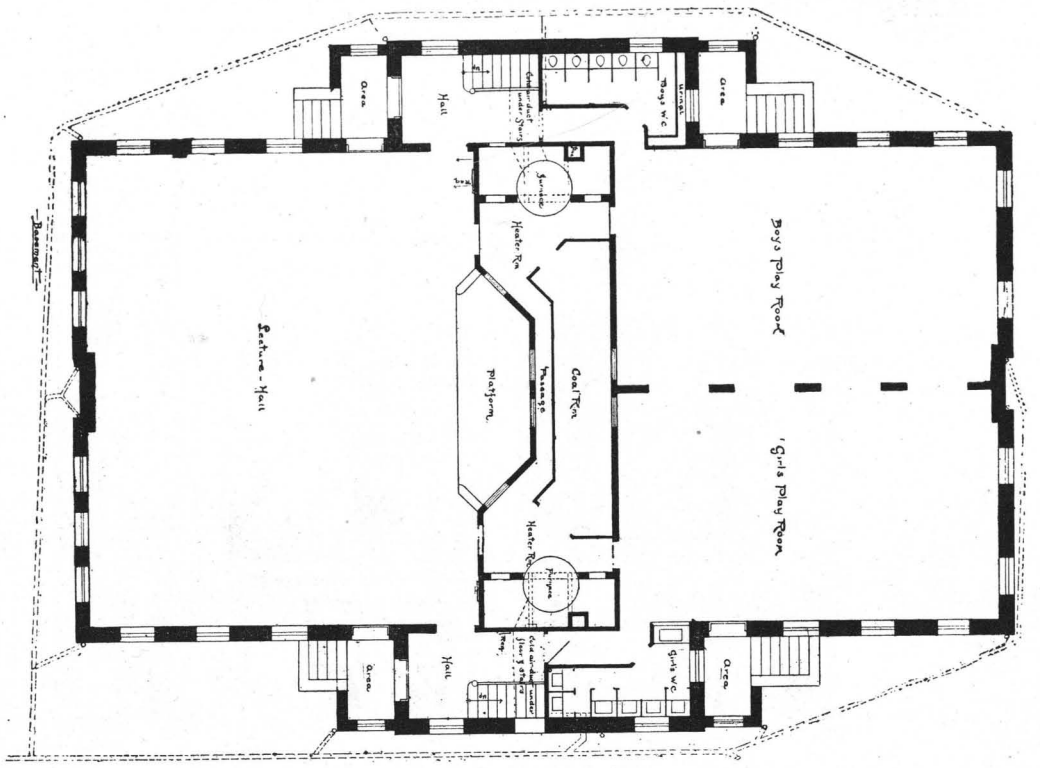
Front Elevation

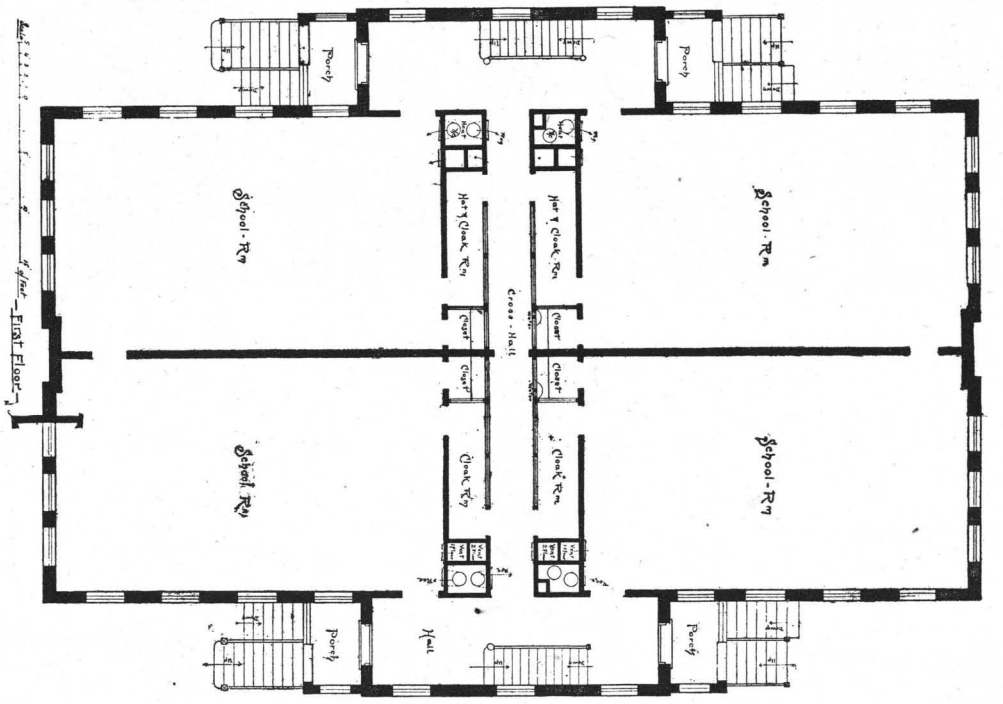


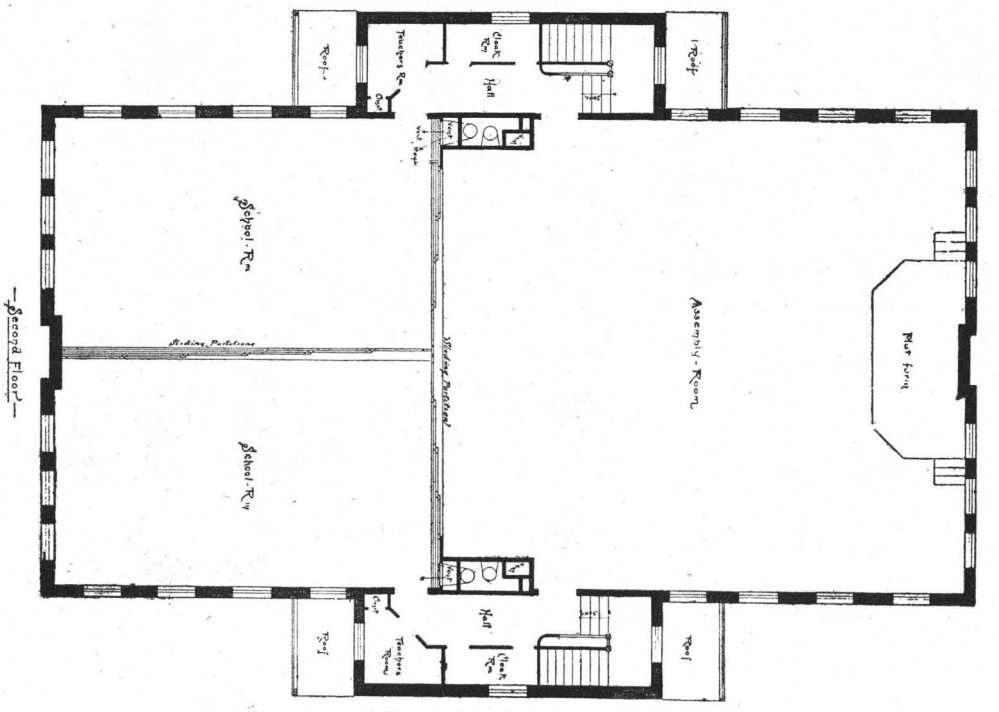
Half Cross Section

Side Elevation

Scale ... of Feet



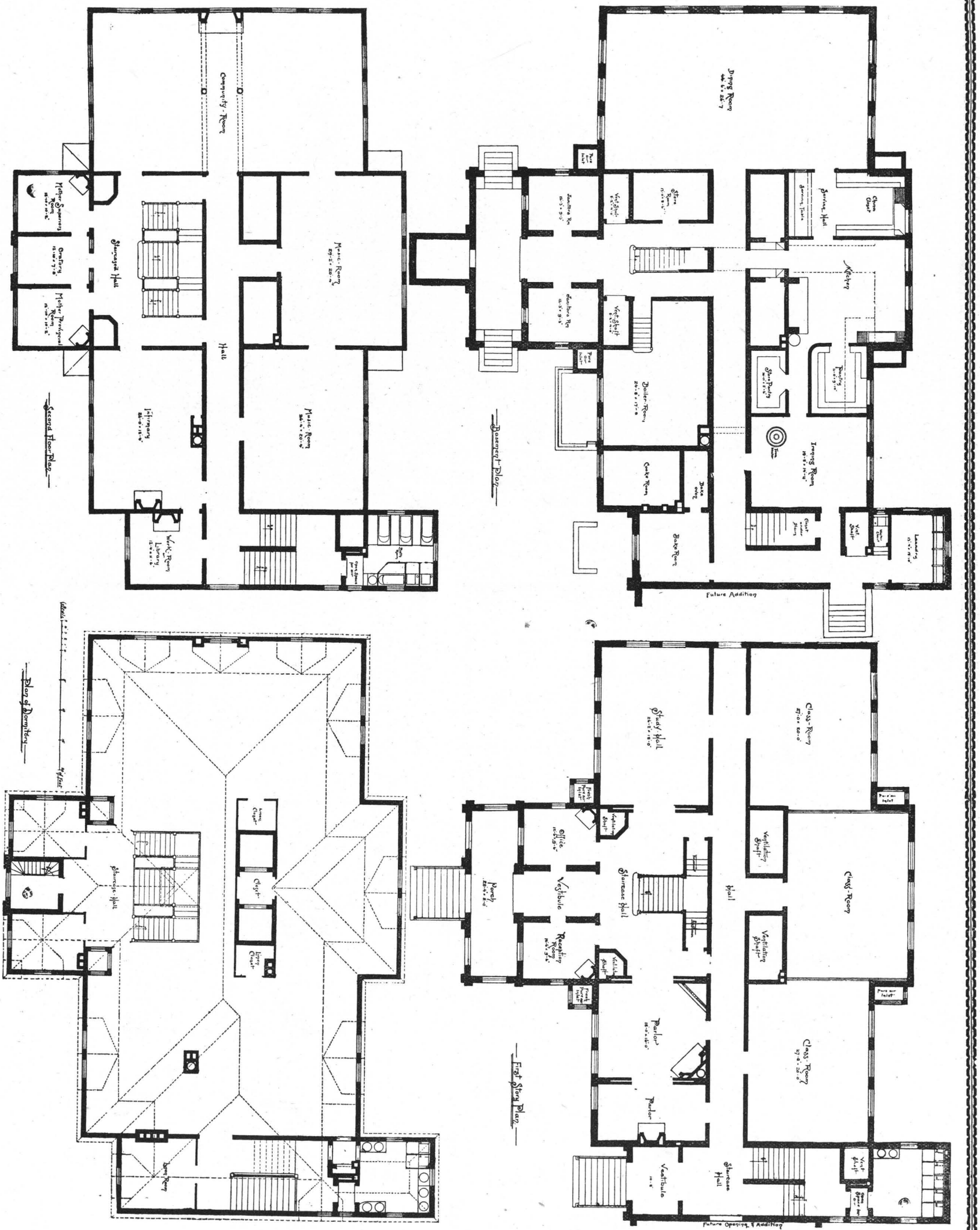


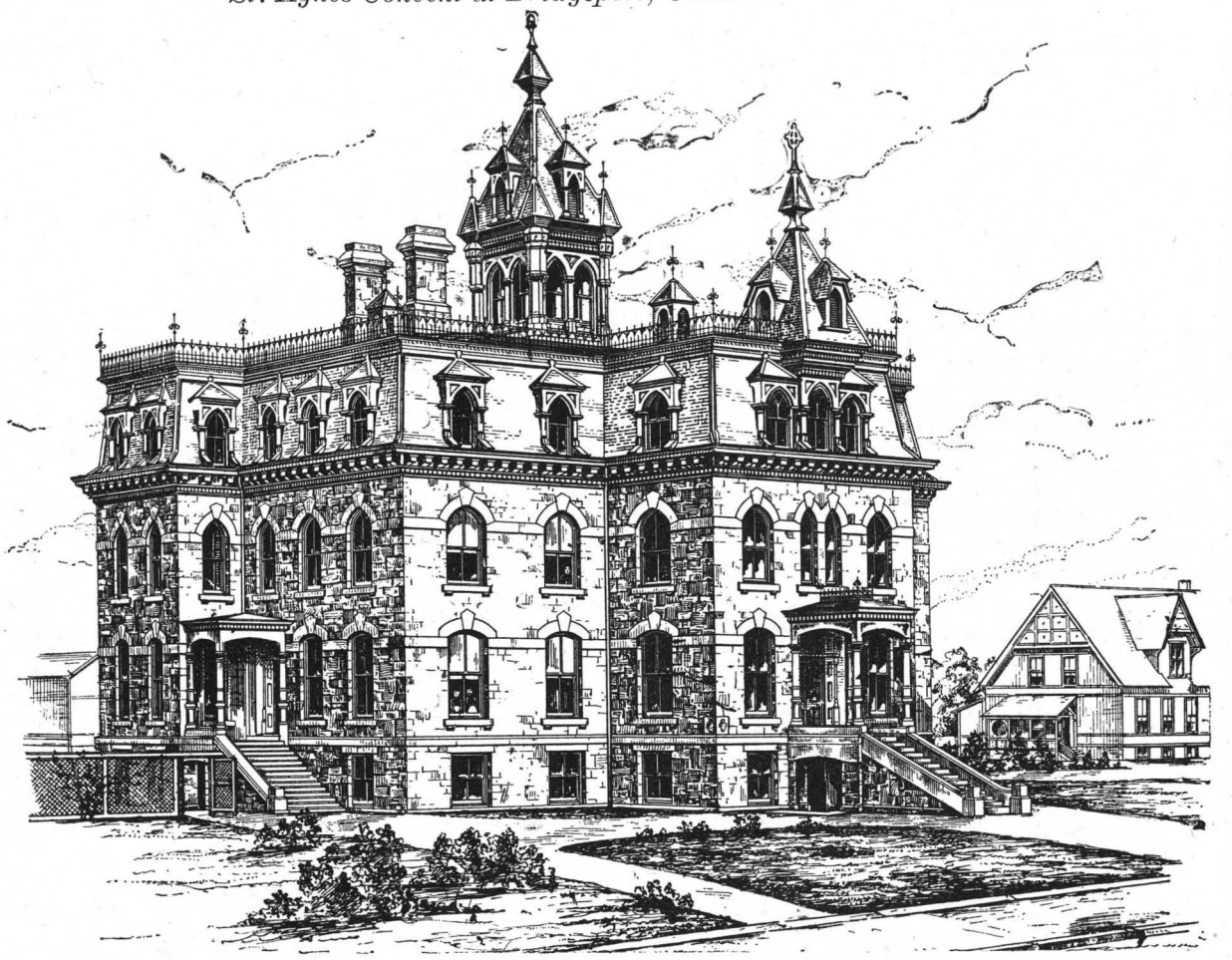


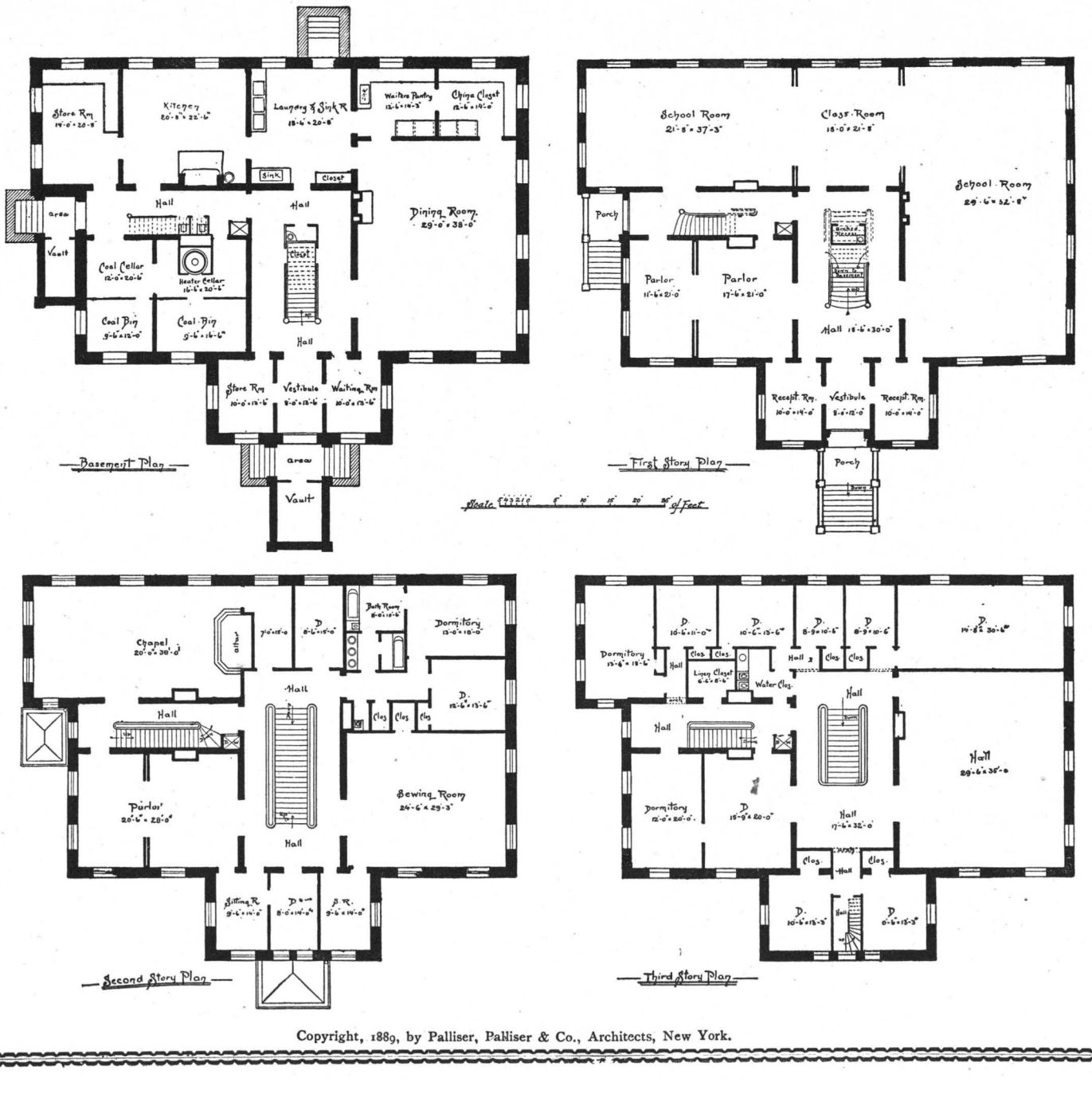
Side Elevation

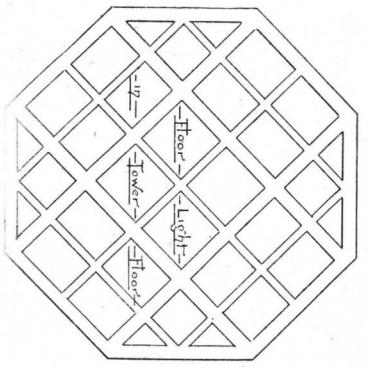
Scale 0 2 4 8 16 32 of Feet

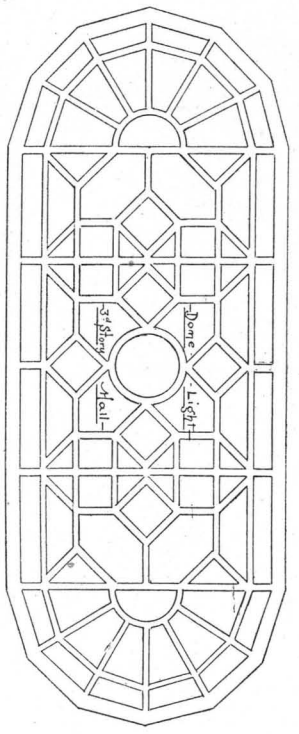
Front Elevation

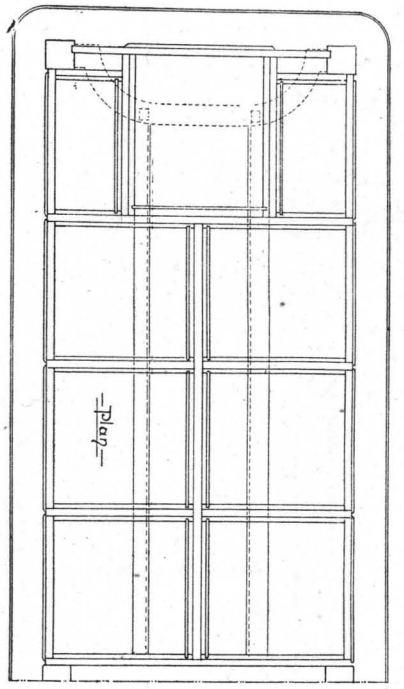


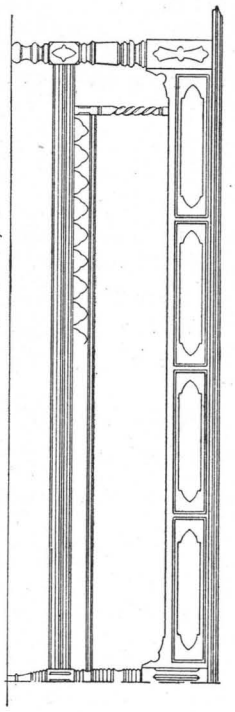




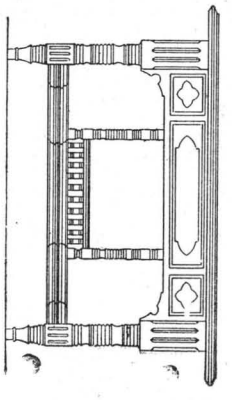






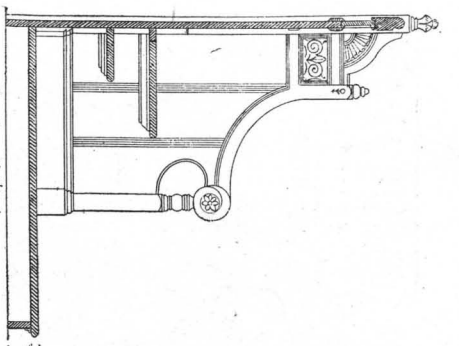


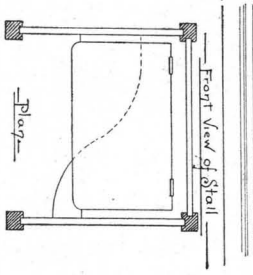
Half side Elevation



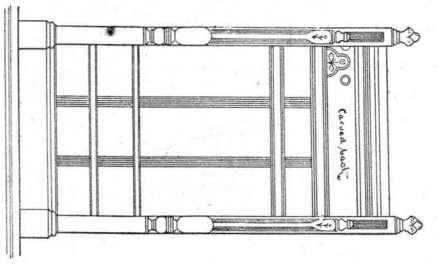
Parlor Table

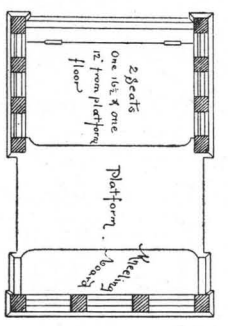
Ends



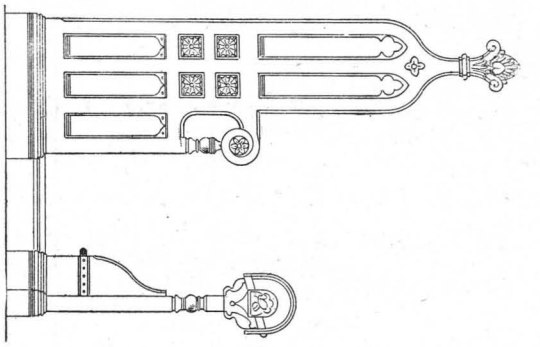


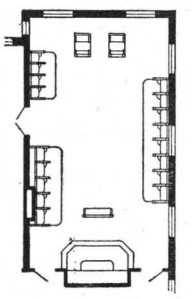
Front View of Stall



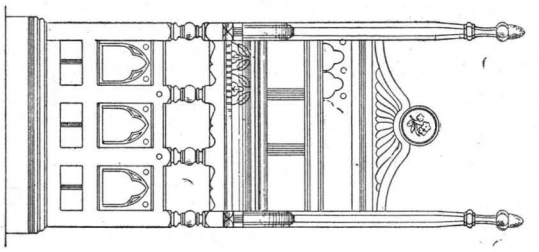


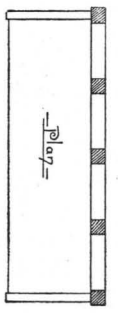
Section





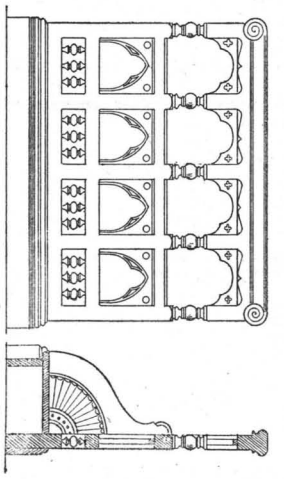
Plan of Chapel





Plan

Elevation
Communion Rail

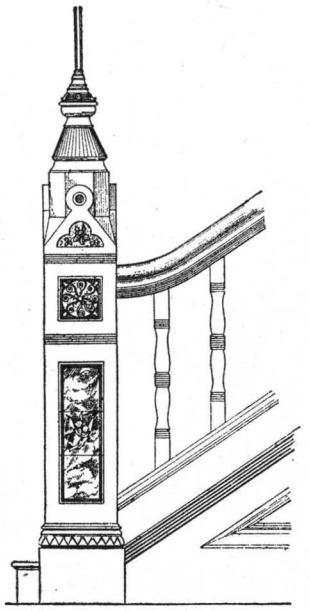


Section

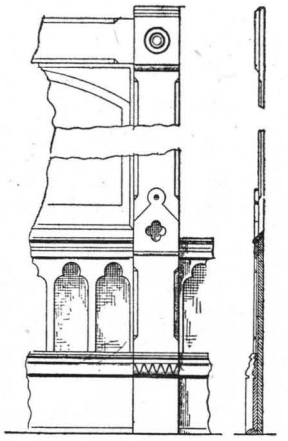
Plan of Chapel

Scale of Chapel Plan

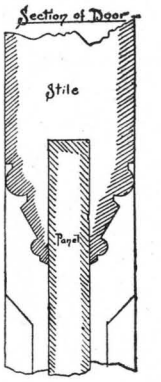
Scale of Details

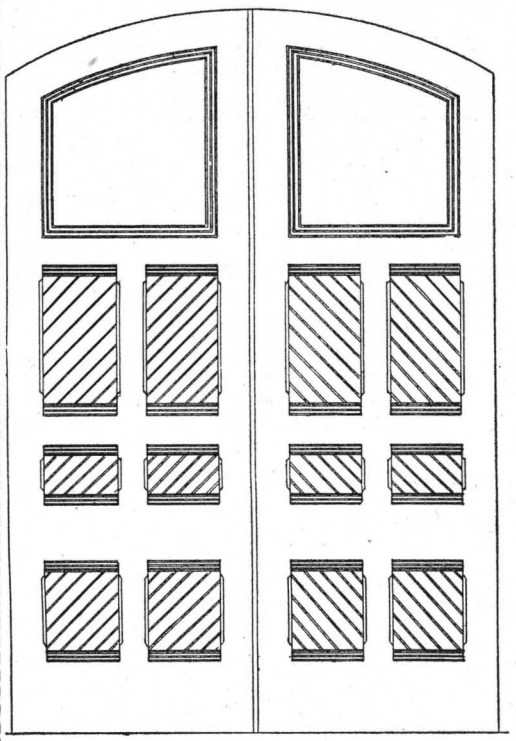


Stair-Detail

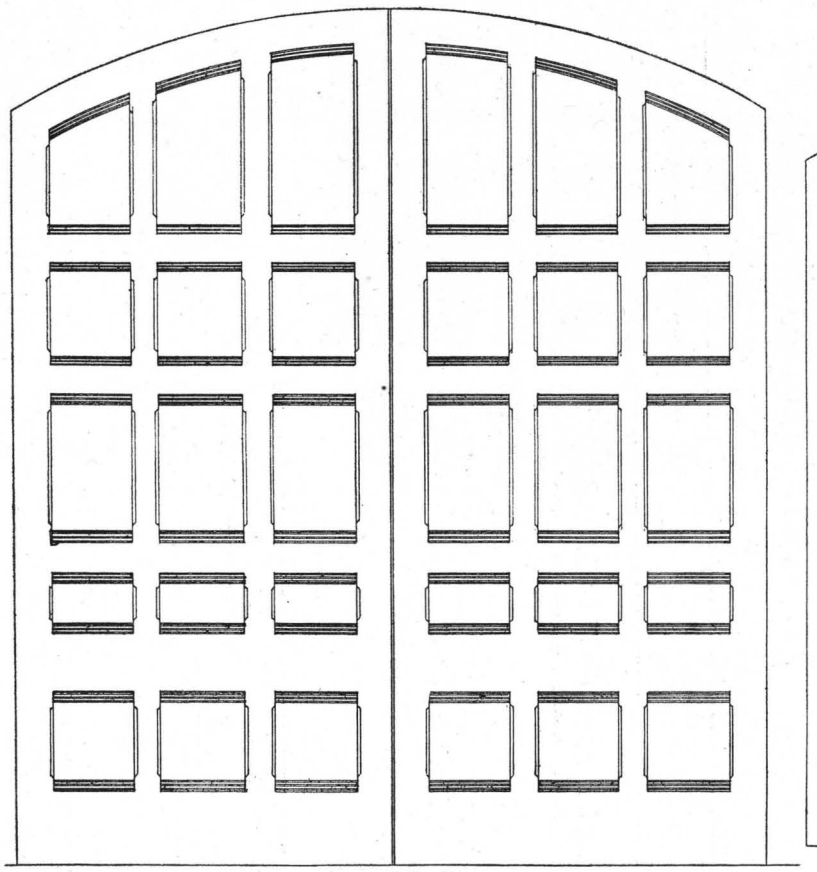


Door & Window Casings

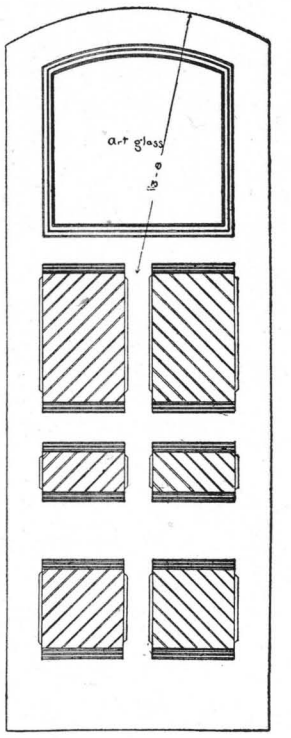




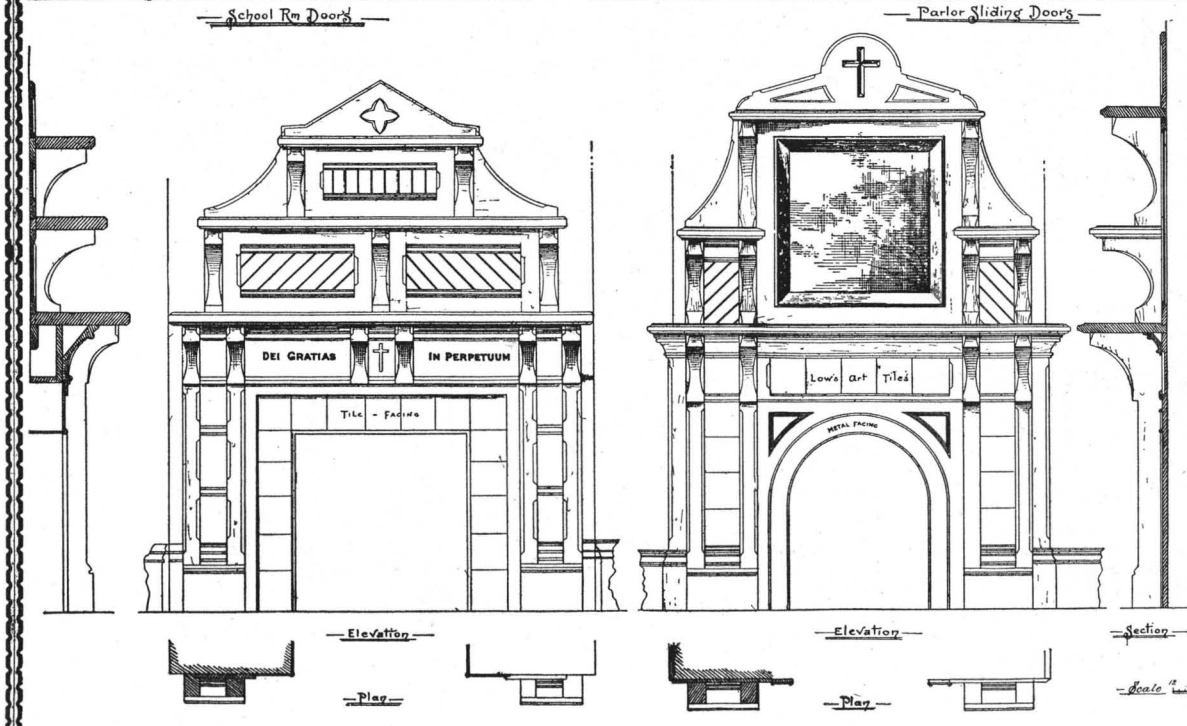
School Rm Doors



Parlor Sliding Doors

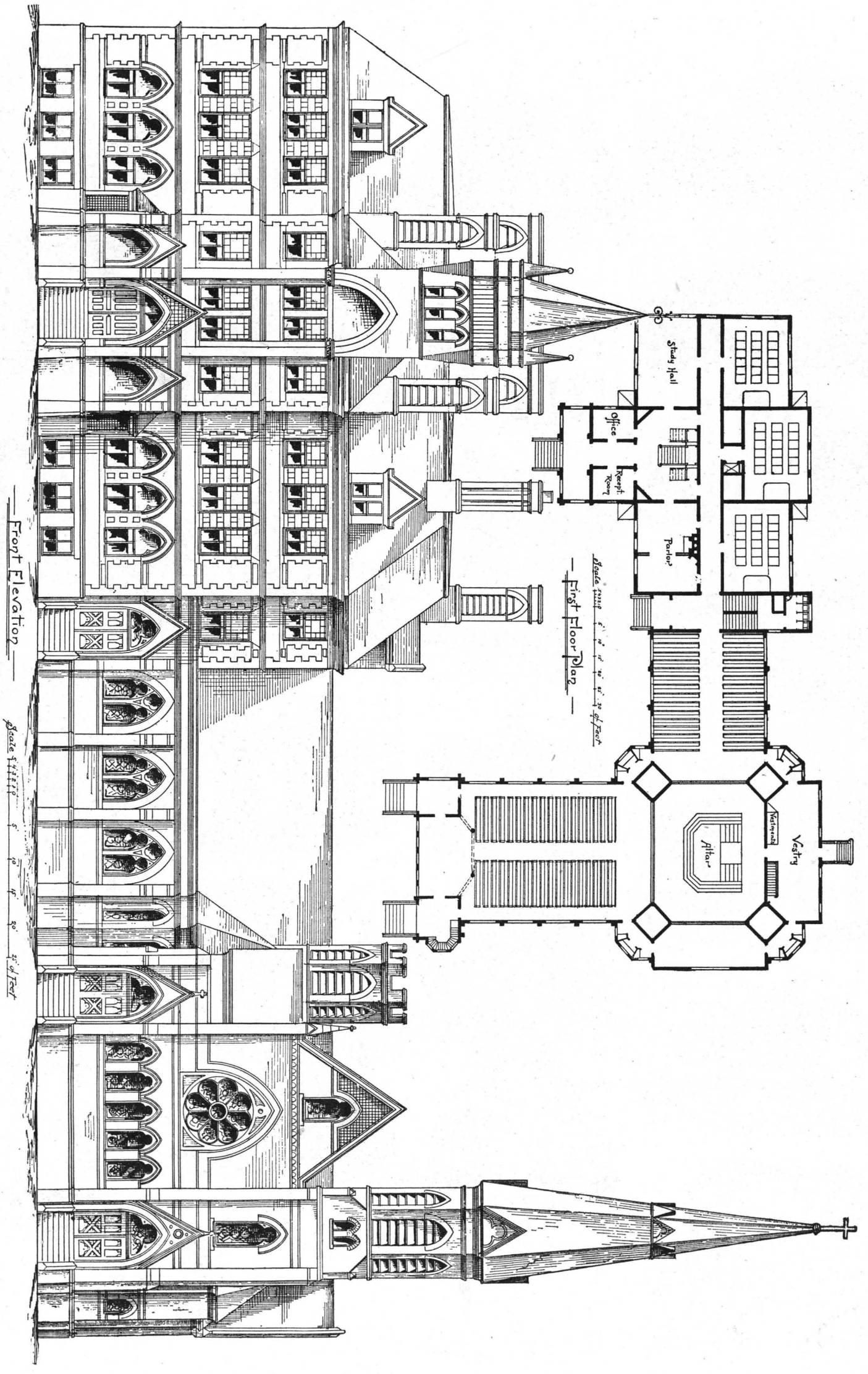


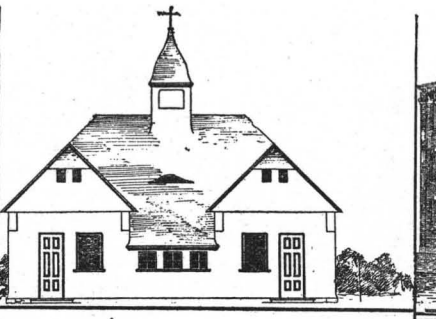
Parlor Door Single

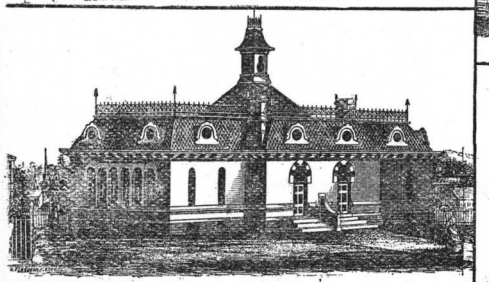


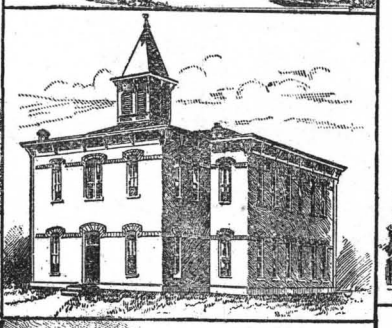
Elevation — Plan — Elevation — Plan — Section — Elevation — Section

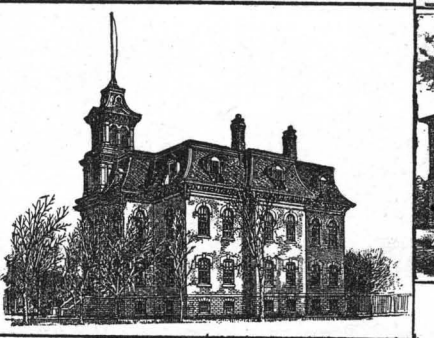
Scale ... of Details

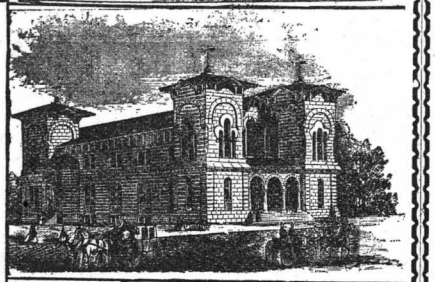


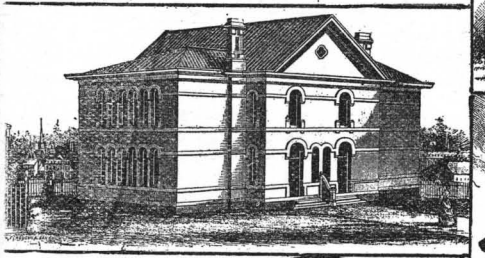


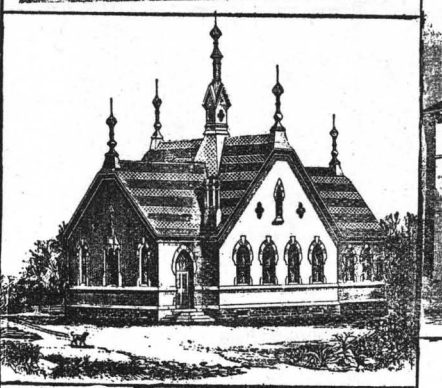


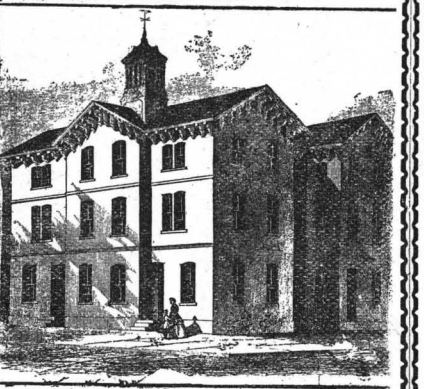


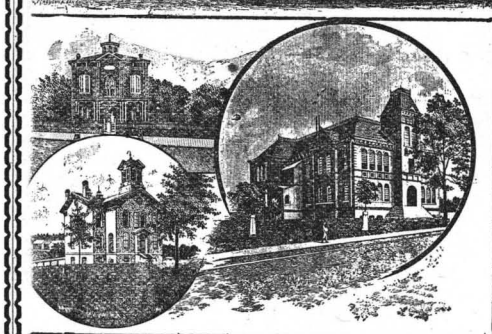


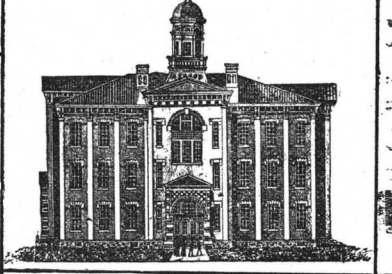


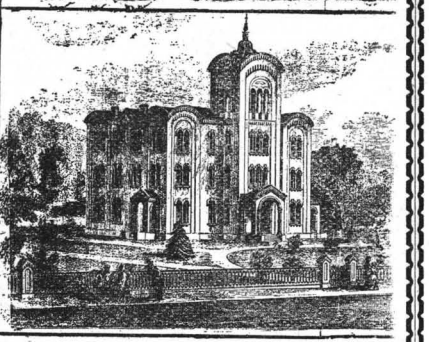


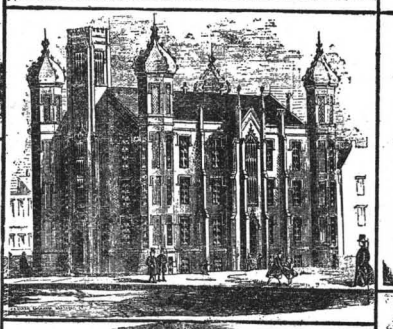


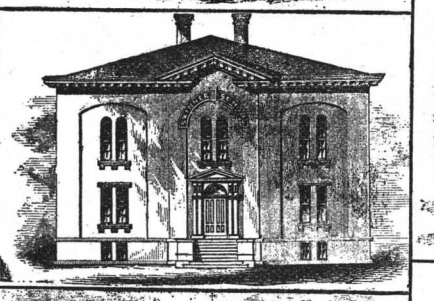


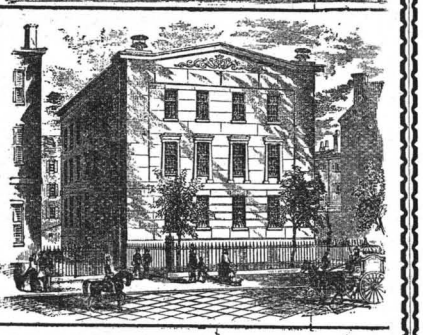


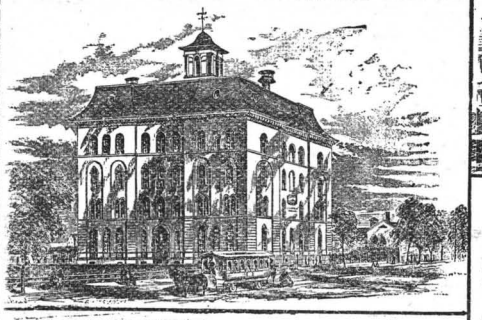


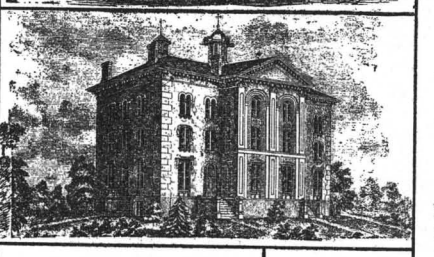


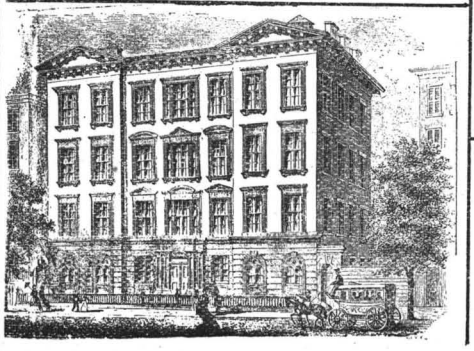


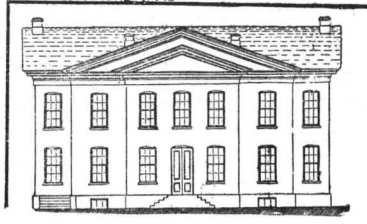


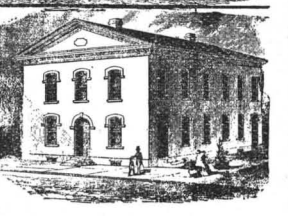








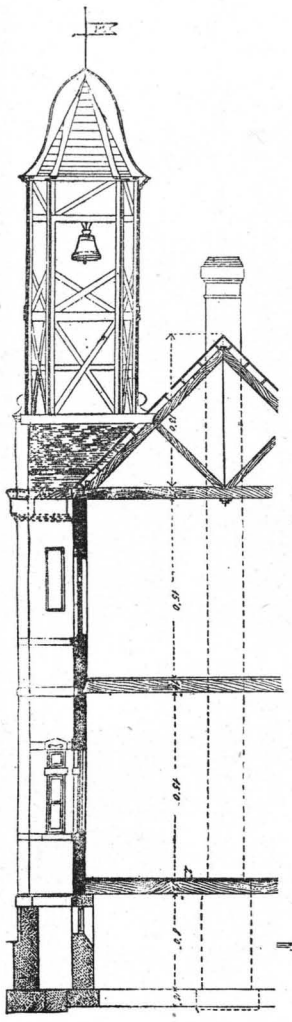




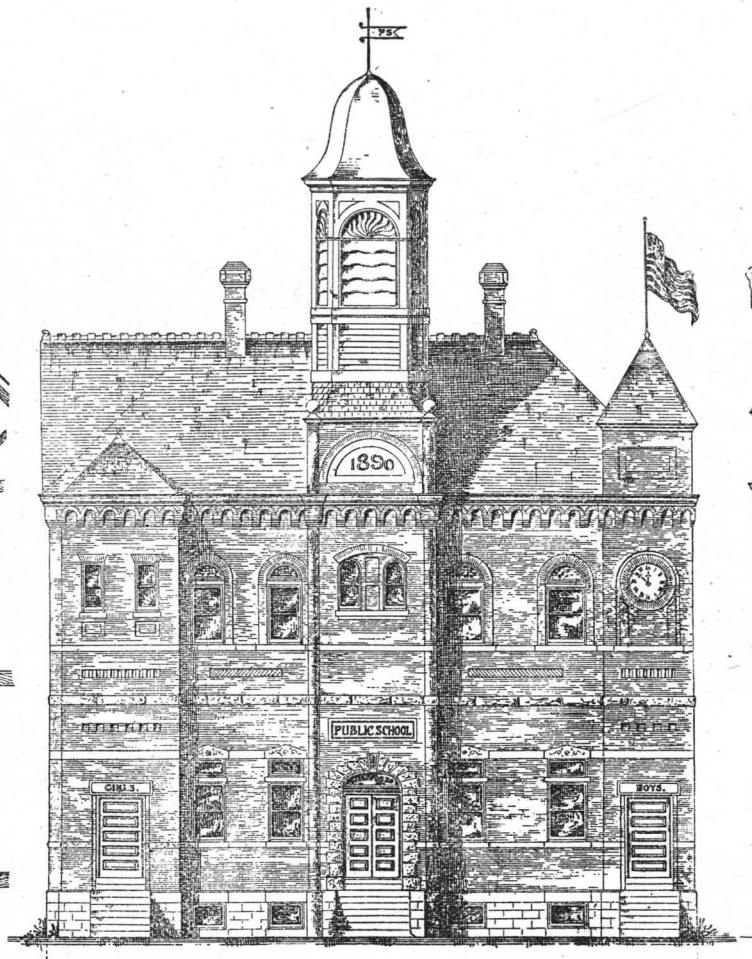
Obsolete Old Style American School House Designs.

PLATE 82.

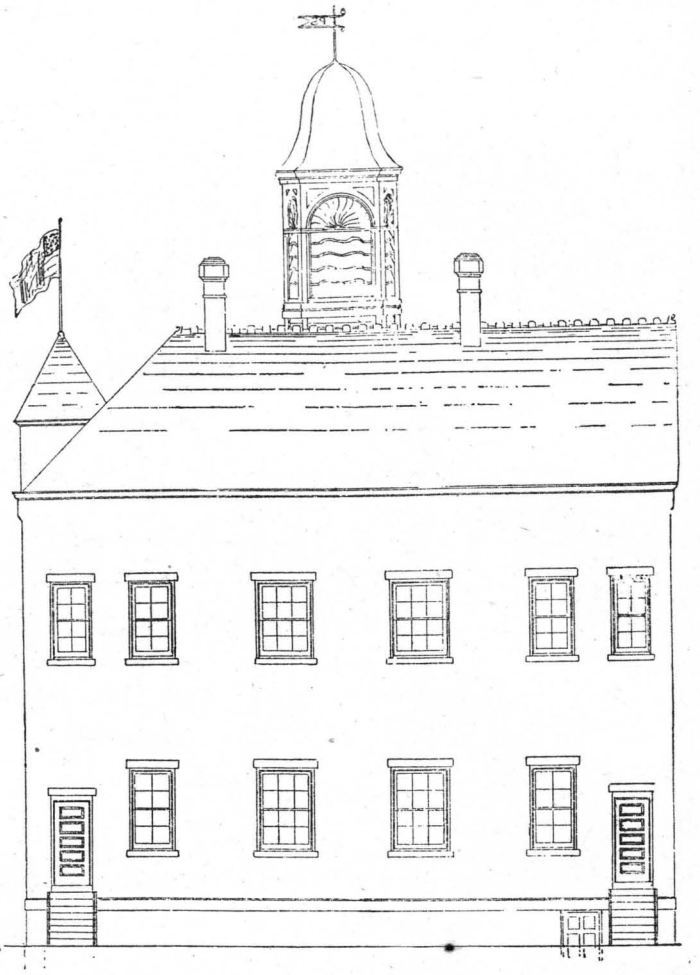
These thirty Buildings
are American
School Houses built
in the Barnesque
Factory and Nondescript
styles and now existing.
They are not models
to be followed in these
days of improvement.



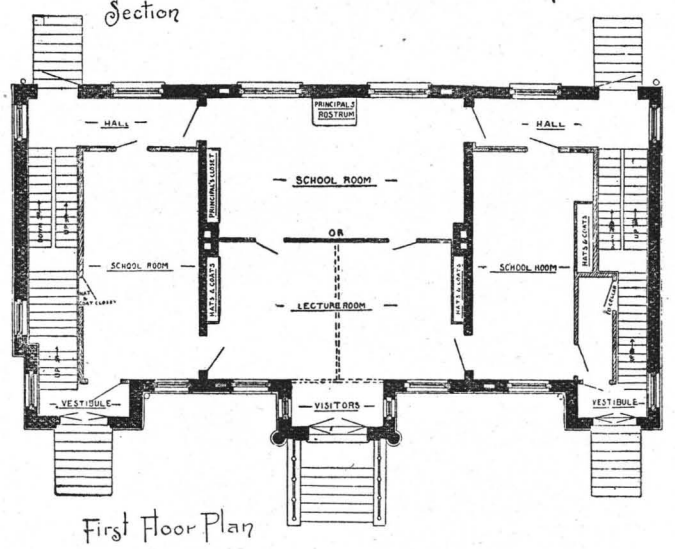
Section



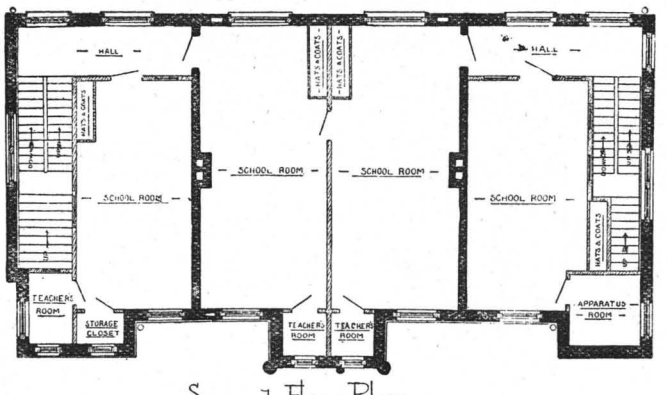
Front Elevation



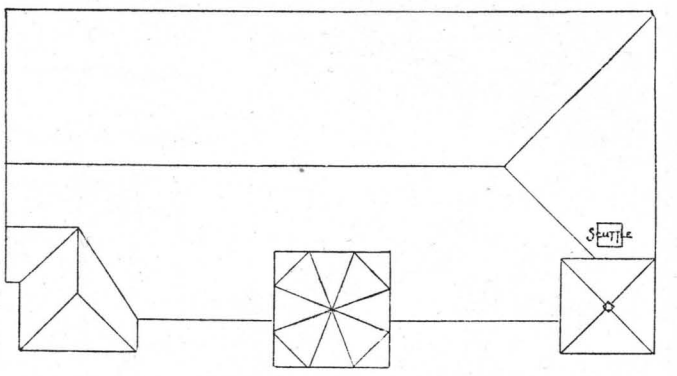
Rear Elevation



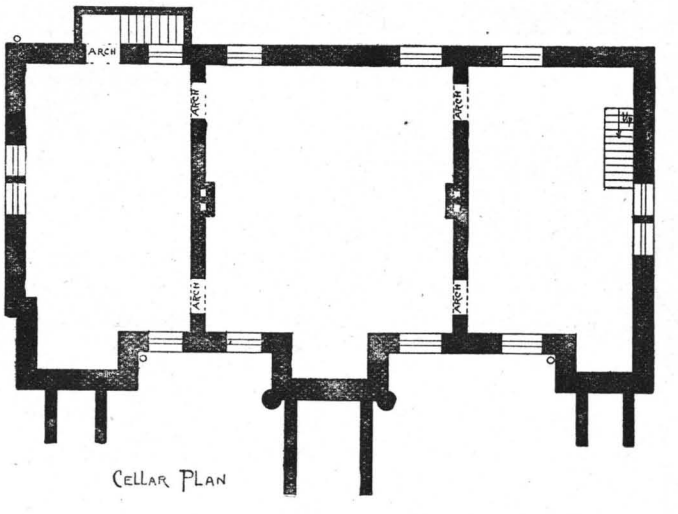
First Floor Plan



Second Floor Plan



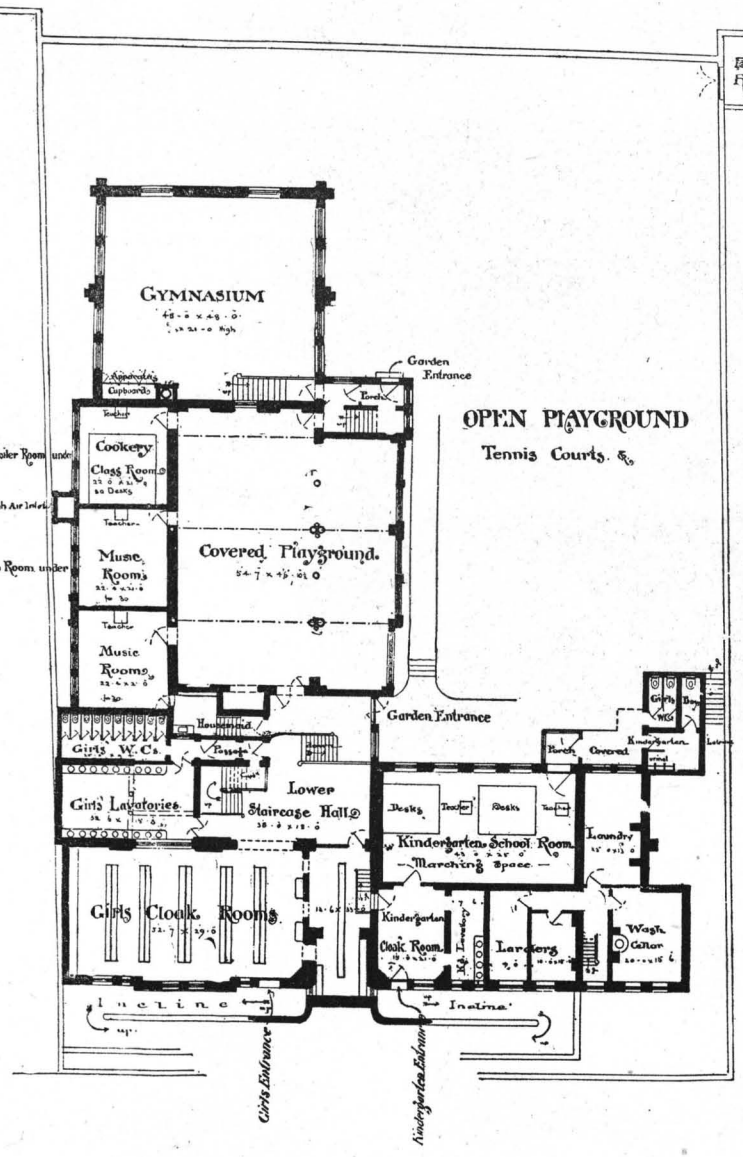
Roof Plan



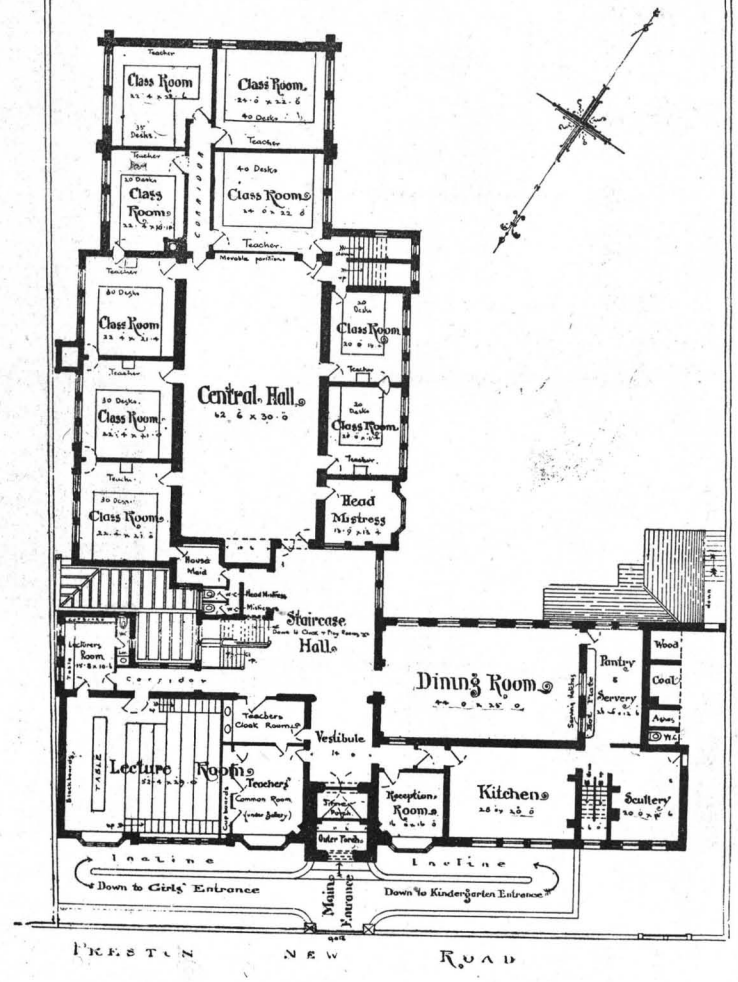
Cellar Plan

Plans for a School House recently issued by a party in New York signing himself Architect and published in a Building Journal — We have seen School House plans before made by Architects who knew nothing about the arrangement and construction of such buildings but this is the very latest and the very worst of all — Such designs as this should certainly not be built after, but on the contrary ought to be avoided just as one would poison ☠

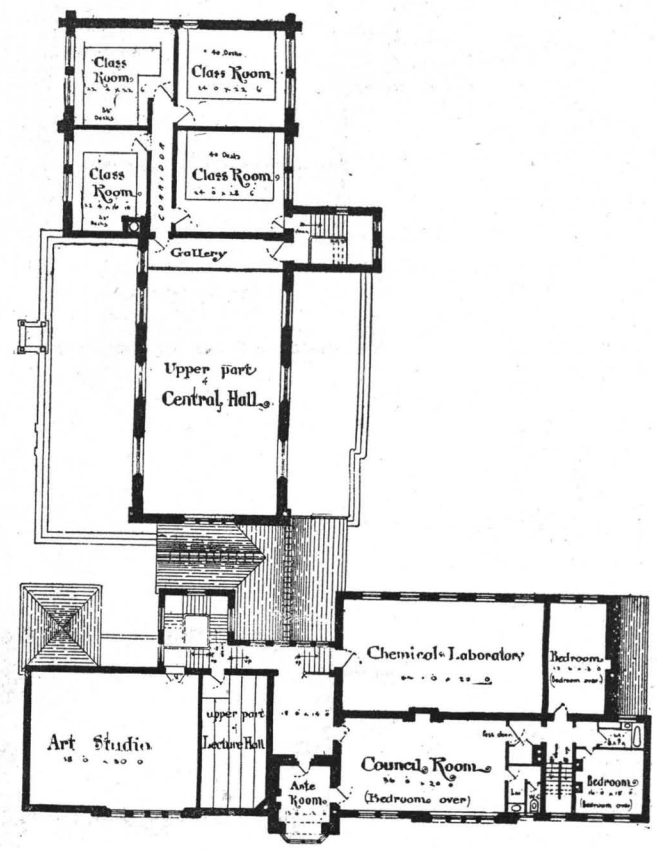
An English High School for Girls.



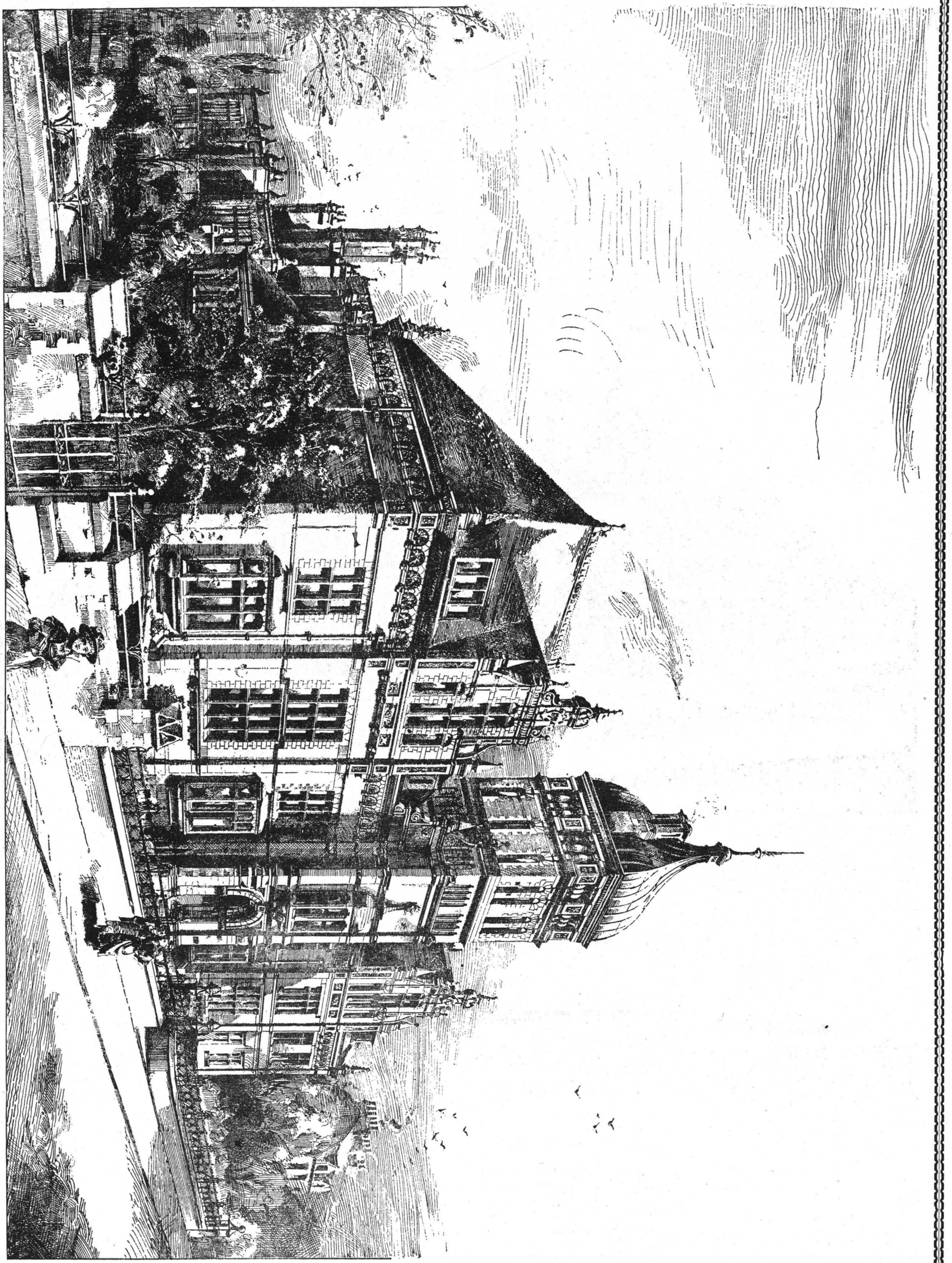
Sub Ground Plan.



Ground Plan.



First Floor Plan.



On the Employment of Architects, etc.

(*Continued from page 59.*)

curt reply, "The Board of Education secured plans without advance payment, payable on adoption of plans and completion of the building"; to which we answered: "The Board of Education might easily accomplish what you state they did by your letter of 7th inst. No reputable architect will submit plans to be judged by people who know nothing about good or bad architecture in school building, and much less about the hygienic construction of such a building, and it is ignorant Boards of Education who are responsible for the present state of affairs, as given in a leading article by one of the leading papers, that not one schoolroom in fifty is properly arranged, lighted, warmed and ventilated."

A gentleman in the far West having charge of the erection of a school building, had sketch-plans submitted him by a leading Philadelphia architect, who has designed most of the fine country residences erected for the merchants of that city, but this architect had no experience on schoolhouses; and it was found that only in the division of the plan had the architect worked it out at all satisfactory, and then he had placed the windows to the right of the scholars, but the external appearance of the building looked too much like a gentleman's mansion, when, in truth, it was intended for a plain Industrial School, and the gentleman having the matter in hand desired to have us submit sketches, but we informed him that we would do so only on his agreeing to pay one-quarter of two-and-a-half per cent. on cost of building, $15.000, which he consented to, and the balance of the two-and-a-half per cent. when approved and full working plans, detailed drawings and specifications were furnished, and this should be about the basis on which school work should be done by architects, and they should certainly not be asked to give their time and brains for nothing. School Boards can easily secure the best service if they want it.

In our opinion the progress made within the last few years in the interior arrangement and external treatment of school buildings, very forcibly illustrates the desirability of seeking the services of an able architect in order to obtain the best results and to meet the true wants and requirements of the schools, rather than by bungling with those who have no ability, character or experience in such matters; and it is a well-established fact, that in these days those who are intrusted with the expenditure of the people's money must demand the most practicable plans that the money they are prepared to expend will procure in the execution of the structure, and without involving any greater expenditure, or even as much—omissions and extras amounting sometimes to fifty per cent. of the contract being saved—if they had blundered and failed to secure these requisites; and in order to reach this result, the services of those who are doing a large and progressive business must be sought.

A well-developed and carefully drawn plan will in every case save many times its cost, by itself being a basis on which exact estimates can be made, and in enabling the School Board to know to a penny the cost of the proposed building, and also what the material and workmanship is to be throughout, and to obtain the completed edifice without disappointment and extras of cost. Another thing the plans given in these pages prove conclusively that there is a very general tendency on the part of the public at large, to secure the best services regardless of the location of the architect, and local prejudices have in consequence often to give way to the better work of an architect at a distance.

WILL YOU DO IT?

When you fall seriously ill do you send out and secure the prices of the different physicians and employ the cheapest?

No, you don't; for sickness is an important matter.

Again, when you need a lawyer for an important case, do you get bids and accept the lowest?

Naturally not; for this, too, is important.

And is not money, then, important? The schoolhouse is where your children are educated, where they develope body and mind with which to go out into the world to make it. Is not the possession of good schoolhouses important? It decides the question as to whether your families shall possess health and strength, or contract disease and death.

Friends, let us be consistent.

You do not order the erection of your schoolhouses on the same principle that you order other important affairs. And it is because (as you say) some architects are too expensive. Accordingly you get bids. Perhaps this plan is sound. Perhaps you have concluded that certain architects' plans and services are worse than none at all, and you think you can get along without them. Perhaps it is a small schoolhouse and seems unimportant, and you desire to save money at the start, and you can afford to take reasonable risks. So far, so good.

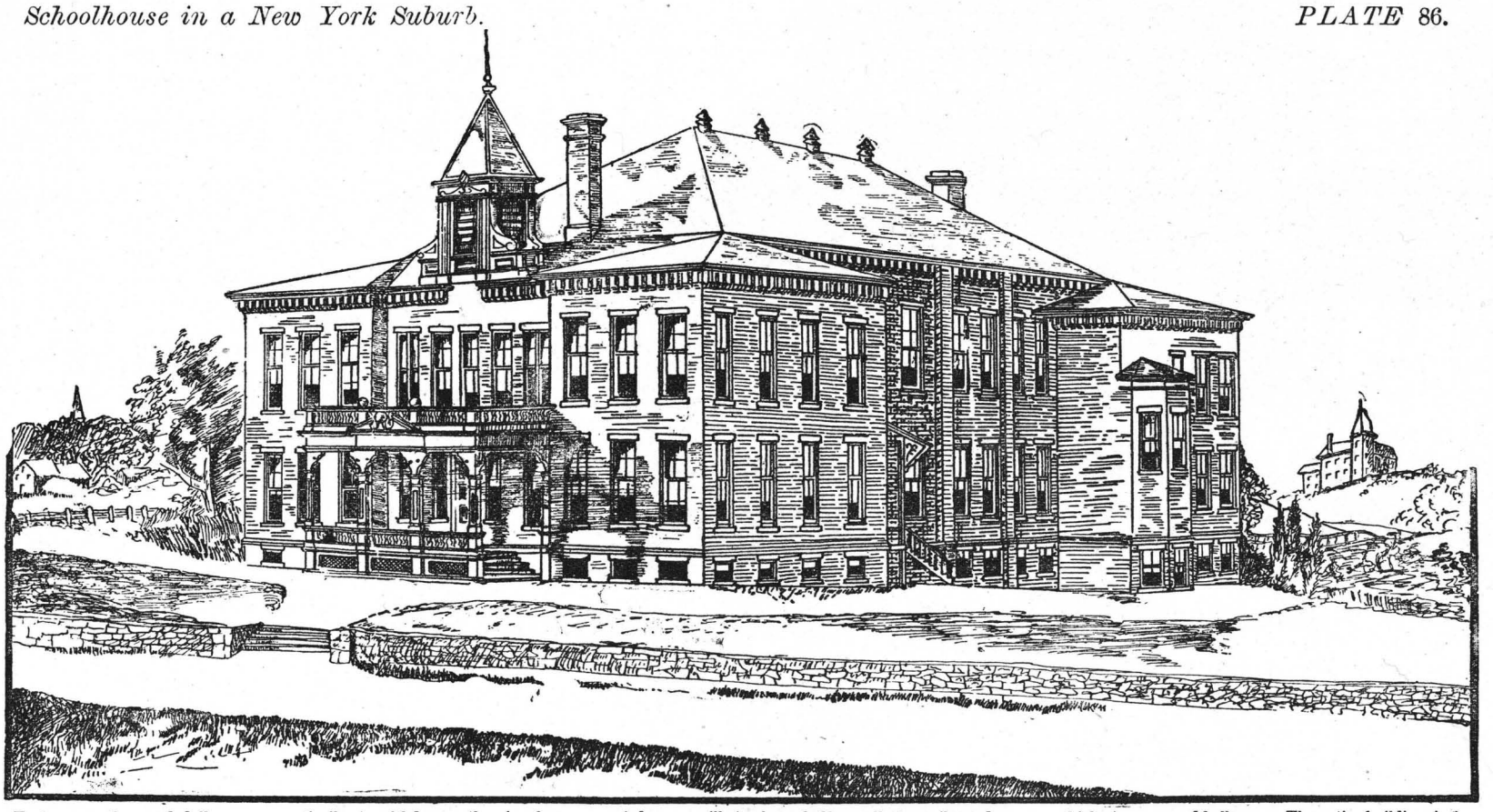
But now one question—and this is the most important we shall ask: Will you take the trouble to think what an important matter the building of a schoolhouse is, to investigate and ascertain the value of an architect's plans prepared by men who have made a special study of school construction, and all the different systems for years, and ascertain what their charges are?

A man named Iago once insisted that reputation was an unfortunate possession. If Iago had been a designer of fine school buildings, and his reputation had so impressed some people that they passed him by as too "expensive," without even giving him a chance to make an offer, his remark would have been amply justified by the facts.

We make plans for every description of schoolhouses, and we charge exceedingly moderate fees. We don't ask much of you; we only beg you, when you are about to erect a new schoolhouse, to let us make an offer. The thing is simple enough. But it has happened that in eleven cases out of every thirteen, when asked for a proposal, we have secured the order.

PALLISER, PALLISER & CO.,
24 E. 42d Street, New York.

Schoolhouse in a New York Suburb. *PLATE* 86.



Forty-seven thousand dollars was practically thrown away by the Board of Education who directed the erection of the above in a New York pretty suburban residence district. The building is devoid of even the most ordinary exterior taste, which almost any good intelligent builder would have applied, and the hygienic considerations of the interior being simply nil—could not have been worse if designed for the commonest purposes rather than that of preserving the health of teachers and scholars who have to assemble within its walls from day to day.

Of course Boards of Education are made up sometimes indifferently of very ordinary material, but then such should know enough to employ architects who have made schoolhouse work a specialty and study for years, and if the Board does not know about these matters, it is their duty to investigate and educate themselves on the subject, and not undertake such important matters until they have done this. A member of a Board of Education is filling a very important position that requires good judgment and brains.

The following clipping appeared in the village newspaper where this schoolhouse was built, and it clearly demonstrates the capacity of the editors as regards the planning and construction of a modern schoolhouse. Editors ought to be men possessing knowledge on ordinary matters like a schoolhouse, but no doubt this book, which is the first and only one ever published giving these modern ideas of the last twelve years growth, will assist the editors and the whole people to a better understanding of the requirements of the times, which we are certain will bear fruit in due season.

The following is admitted by all sanitary authorities:

1st. The *warmest* air in a room naturally occupies the highest parts of it.

2d. In an occupied room the most impure air will *always* be found *nearest the floor*, unless such impure air is of a *higher temperature* than the fresh air that is admitted to the room.

3d. If, then, a constant supply of pure air *at a temperature higher than that in the room* is steadily admitted, and a constant and equal amount of *the air near the floor* of the room is withdrawn, the air of any occupied room will be kept perfectly pure, provided only that the supply and exhaust are of sufficient volume to equal the amount constantly vitiated.

The above points should be borne in mind by those reading the following newspaper article, also that the party who put in the heating apparatus bears the same name as one of the School Board, and no doubt this steam-heating contractor had something to do with getting this architect the job, and he also doubtless designed and specified the warming and ventilating system himself, as it is a common thing for steam-heating men to do this. The so-called ventilating registers in each room are placed close up to the ceilings:

"The new school building shown in the cut above will be occupied for the first time on Monday next, February 25th. The old school which occupied the same site as the new one was destroyed by fire on March 30, last, and in less than a week Leland Castle was hired, fitted up and occupied as a school, and since that time up to Thursday last has been thus used.

"Shortly after the destruction of the building and pursuant to an act of the legislature, a district meeting was called to determine whether or not the district should be bonded to raise money to build a new building.

"At this meeting the Board of Education was authorized to issue bonds to an amount not exceeding $36,000, which, with the insurance on the old building, amounting to $13,000, formed the fund from which the new building has been built and will be furnished.

The newspaper description is as follows:

"The building is about one hundred and fifty feet long by eighty-three feet wide. Entering by the front door on the right side of main hall is the room of the principal, and on the left side is the meeting-room of the Board of Education.

"At a distance of twenty-eight feet from the front entrance and at the same distance from the rear end of the building, hallways cross the main hallways, all of which are twelve feet wide. The hallways, forming a capital letter I, and are heated by steam radiators.

"Opening on these transverse hallways in front, there are two splendid classrooms, 26x23, and in the rear one classroom 35x26 feet, for the class of the smallest pupils, and a room which is to be used for library purposes, and a dressing-room for lady teachers.

"On each side of the main hall are two classrooms, 20x27 feet. At the east end of the front transverse hall and the west end of the rear transverse hall, are broad stairways leading to the basement, and to the assembly-room and classrooms above.

"On the upper floor on each end of the building are three classrooms, each 23x26 feet, and opening into the assembly-room.

"The assembly-room is probably the best, largest and finest of any school in this county, if it is equalled in this State. It is 93 feet long by 55 feet wide, thoroughly lighted, ventilated and heated, and with a ceiling twenty feet high.

"There is a basement under the entire building, perfectly dry and with concrete floor. The front and middle of this basement is to be used as playground for the children. In the basement under the recitation-rooms in the rear end of the building are the waterclosets for the pupils, and the boiler and fireroom for heating the building. Each classroom has a ceiling thirteen feet high, and the most approved system of ventilation and heating have been adopted. The entire building is heated by steam from the large boiler in the cellar, the fire to which is regulated automatically, and each classroom has two steam radiators placed under the windows. The fresh air is allowed to reach the heated pipes from openings under the window sills and when heated enters the room near the floor.

"The rooms are each fitted with ventilating shafts in which a draft is constantly kept by means of gas jets burning in them, thus insuring the escape of the impure air.

"On each floor there are water pipes leading from a large water tank holding more than 2,000 gallons, to which hose is to be connected for use in case of fire. The tank, which also supplies the boiler, is situated above the classroom in the rear end of the building which is filled by the water from the room, or by pumping from the extensive cistern in the yard in the rear of the building.

"Each class-room has connected with it a commodious cloak and hatroom for the scholars, which can be entered both from the classroom and hallways. The entire building is finished in ash, and without paint. In design and interior arrangement, heating appliances and in ventilation, as well as in the large, airy classrooms, and the beautiful location, overlooking the Sound, this village can claim the best school building in this county, and the equal of any in this State.

"The total cost of the building, the additional land purchased, and the new furniture necessary to furnish it, will, it is expected, nearly reach $50,000; the building alone costing about $47,000, and is insured for $40,000.

"The school is to be arranged so that the primary classes will be on the first floor, and the grammar classes on the second floor, and the smallest pupils will occupy the most commodious room in the building."

This same New York architect, since building the above, has secured a $35,000 schoolhouse job in an adjoining suburb to this one, and it was done in this wise: The Board of Education is made up of men employed in New York, and one of them was a plumber, working in a plumbing shop who does most of the plumbing work for this same old-established architect in New York City, who has a great deal of alterations, overhauling, and repairs in charge for old estates, and each member of the Board agreed to bring in a set of plans at a stated time for consideration. This plumber had a plan made by this architect; and the others had plans made by draughtsmen and young men just going into business, who knew nothing about school buildings, and the members of the Board, not knowing anything about such matters themselves and apparently caring less, made the selection. They might have had a good thing without going out of their own village, as this particular suburb contains fourteen architects' offices, and we know one man amongst them who has been in the business fifteen years, ten of which he spent in our offices and knows his business thoroughly, and especially as regards school work. Most of these men were ready to give the Board their best efforts in this case, if they would conduct a proper competition, but the Board refused to receive any plans for consideration, except one set each brought in by themselves

PRICE-LIST for full working plans, detail drawings and specifications, with required changes and alterations, for each of the designs contained in "PALLISER'S COMMON SENSE SCHOOL ARCHITECTURE." Specifications are furnished in duplicate. A dozen of our blank form of agreement for building with bond are included.

DESCRIPTION.	PAGE.	PLATES.	PRICE.
High School of 10 rooms and an Assembly Hall,	4		$225
16 Room School,	7	1 to 3	450
A School House similar in style to above with 6 rooms on each of the first and second floors. Two rooms on third floor, together with Assembly Room to seat the entire School,			500
Fowler Grammar School,	10	4 to 25	500
A School like the Fowler Building, 3 stories high, for a High School, with four rooms on third floor and also a large center room for High School and Assembly purposes, stairs all fireproof; cost of such a building, $75,000,			650
8-room Brick,	37	26	90
The above 8-room School, with rooms enlarged to 23x32 or 26x30 or 35 feet,			100
High School,	38	27 to 31	250
High School, with rooms made 23x32 or 26x30 or 35 ft.,			325
One-room frame, shown in three different styles,	47	32	each 15
One and two-room Village Schools,	49	33	20
Two-room Frame School, shown in two different styles,	51	34	either 25
Frame School,	53	35	35
One-story Brick Village School, two rooms for 120 Scholars, with warming apparatus and play rooms in Basement,			35
A Model Frame Village School, 3 rooms, one story, with bell cot, flag staff, etc., etc.,			35
Brick and Frame,	56	36–37	60
Brick and Frame, with rooms enlarged,			75
Brick, 4 rooms and Assembly Room,	60	38–39	100
" " " " " " with rooms enlarged to 26x30 or 35 ft.,			125
4-room Brick as shown or with rooms enlarged,	62	40	75
2-story Model Brick School House, with bell tower, to accommodate 250 Scholars, Library, etc.,			75
8-room Brick,	63	41	125
" " with rooms enlarged to 23x32 or 26x32 or 35 ft.,			150
Model Parochial three-story Brick School House, with separate entrances for boys and girls, tower, etc., accommodating 500 Scholars on two floors, and a large Assembly Room on third floor to seat 600			200
Normal School,	65	42 to 46	650
" " same width, but 12 feet shorter, and the large Assembly Hall on second floor 16 feet shorter, but of same width and seating 1,150,			600
Stone and Frame,	70	47	$110
Brick, 6 rooms,	71	48	125
High School,	72	49–50	175
Frame and Brick veneered,	74	51–52	65
Village School and Teacher's Residence,	76	53 to 55	55
Brick City School,	80	56 to 58	80
" " " with basement, etc.,			100
Frame " " " " "			60
10-room Brick,	83	59	150
10 " " with rooms enlarged,			200
High School,	84	60–61	275
Grammar School,	86	62–63	275
" " 3 stories and larger rooms,			400
Model Brick School House, 8 rooms, tower, entrances in center of front, separate for boys and girls, etc., etc.,			200
One-story Frame,	88	64	25
" " " but made into 2 rooms to seat either 48 or 60 scholars in each as desired,			35
6-room Brick,	89	65	75
6 " " with larger rooms,			90
Village School, Library and Public Hall,	90	66	45
Kindergarten,	90	66	25
8 room Brick,	91	67	90
8 " " with rooms enlarged,			115
Collegiate School,	92	68	100
" " enlarged,			150
Indian "	93	69	120
Industrial "	94	70	45
College,	95	71	175
Old house made into Boys' Boarding School,	96	72–73	200
Parochial School of Brick,	98	74–75	125
8-room Model Brick Grammar School House, rooms 23x32 feet in size, fireproof stairs, entrances on sides similar to Parochial School,			125
Brick Convent,	100	76–77	200
Stone "	102	78 to 80	350
Brick " and Church combined,	105	81	450
School Houses of various sizes made to suit modern ideas, with best hygienic results in light, air, warming, plumbing—practical and economical,	106	82	25 to 400
Brick School House, but made to conform to all proper requirements,	107	83	125
High School, (English) but changed to meet American wants in arrangement of plan, etc., etc.,	108	84–85	550
Two-story Suburban Brick School House, but with a pleasing exterior and a proper arrangement and sanitary construction of the interior,	110	86	450

We have no interest in a system merely to make money out of it, like unto a manufacturer or contractor who protects his wares by letters patent, making for himself as nearly as possible a monopoly to get rich out of the taxpayer's pocket, and we have therefore no reason to try and influence Boards of Education to adopt our ideas and plans, other than strictly on their merits. Our endeavor is to make everything simple and practicable by adopting natural methods and by avoiding humbugs, deception and complication.

Our method of warming and ventilation cannot burn down the building like some others have done, and continue to do. We waste no school room space by furring out ducts and flues on the walls or by furring up the floors for air space. We conceal nothing. Our tests extend over twelve years in the largest and best buildings in the United States. Economy is an important point to be gained when practicable, and any ordinarily intelligent mechanic can put up the work, and therefore the exorbitant prices usually charged by patentees are avoided. We, however, plan for any system of warming and ventilating known and desired, and we are familiar with all, and in fact, several have been worked up to a more or less extent from that represented in this book and all are undergoing constant improvement at our hands.

Members of School Boards, etc., interested in the subject and visiting in the vicinity of New York, will do well to call at our office, and we will see that they can inspect some of the finest buildings where perfection has been sought in the construction of Public Schools, which leads the world for safety, health, convenience and utility, where ventilation is scientifically attained and dangers from fire and panic greatly reduced.

School Trustees, Boards of Education, etc., who have charge of the erection of such buildings can arrive at their exact requirements and order from above, and all changes are included at the prices quoted.

OFFICE OF

Palliser, Palliser & Co.,

ARCHITECTS,

ESTABLISHED 1877
AT BRIDGEPORT, CONN.

24 East 42d St., between Madison and 5th Avenues,
NEW YORK.

DEAR SIR,—If you have selected a design from some book or other publication that about meets your wants, we shall be pleased to furnish you for a reasonable compensation working plans and specifications for the same with any changes desired, but if you wish a specially prepared design and plans to meet your requirements we would refer you to the following:

It is desirable for parties who contemplate building to obtain the greatest amount of room, with the best architectural effect, for the amount of money expended, and to accomplish this they should secure the services of a competent architect, one who has made such things a study and pursuit for years, and has used every means to become familiar with it in all its detail. The parties for whom the building is to be erected should carefully study their wants, and give their ideas to the architect, to be worked out by him; he can then prepare a complete set of drawings, details and specifications. The proprietor knows just what he is going to have before the building is commenced, and he feels the assurance that there can be no misunderstanding with his contractor, as the architect's drawings and specifications serve as a mediator between the owner and contractor, to remind the former what to require, and the latter what his agreement is to perform.

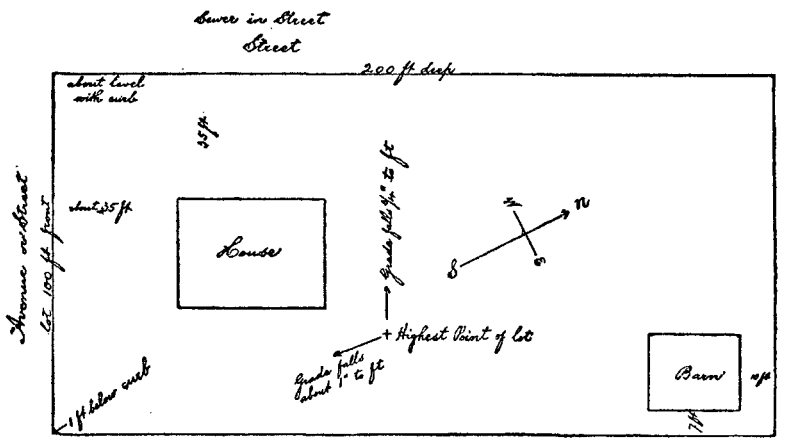
Care should be taken by clients not to place too many restrictions on the architect—how he shall do this or that, and make a mere draughtsman of him; but after stating the price, it would be well to say what room is required, and give him your ideas on the matter; and you may be sure that everything will be added to the building which can be, internally and externally, that will enhance its beauty and usefulness.

When parties communicate with us with a view to obtain our services in preparing plans, etc., they will please give the following particulars, and any and all the ideas they have on the subject which they may deem of importance.

1. The amount you will expend on the building to make it complete in every particular. Do not state an amount less than you really intend to spend, as by so doing you may be disappointed, as some of our clients have been heretofore on account of their understating the amount they were willing to expend, with the idea that it was sure to run up above the amount they named. A lady client of ours instructed us that her house and barn must not exceed $10,000 in cost, and the actual cost by contract was $9,500, and she was disappointed and would have been glad to have had it better finished and more elaborate work and would willingly have paid $15,000, and believed at the start that it would run up to that figure before it was finished, her friends having informed her that architects' estimates were always increased in actual execution by about one-half.

2. Prices of labor and material in your locality for cash; also state how you intend to have your work done, by contract or how, or would you give it proper personal attention yourself, and sharp business management in buying the material and getting the work done according to advice and suggestions that we could give as to purchase of some of the materials and doing the work; give character and ability of contractors in your locality that you are likely to employ; are they mechanics and workers, thorough, pushing, wide-awake business men and close buyers for cash, or are they bound to buy in the local market and pay whatever some one chooses to ask, who gives them credit, and are unable to buy elsewhere?

3. Nature of ground, size and shape of lot, grade of ground and in which direction the building will front, also principal side. The best way is to send a rough draft of the lot, with points of compass, and indicate roughly where building is to be placed, something like this:



4. What material will be used in construction? Wood, brick or stone? Give full particulars where material can be obtained, and state which can be had most conveniently and economically for the several purposes. What is your preference for foundations and also for underpinning?

5. Particulars of other buildings near it, if any.

6. Number and what rooms are required on each floor; heights of ceilings and number of floors; also give particulars of any special disposition to be made of any of the rooms on account of scenery, views, or otherwise.

7. What the building and rooms are to be used for.

8. From which direction are your most severe winds and storms.

9. Give particulars of locality and character of the grounds and surroundings, and any special circumstances to be considered in the design, and in the location and arrangement of rooms.

10. What improvements are required, such as heating, hot and cold water, bath, gas, water closets, etc.

11. Outside finish—porches, tower, bay-window, verandas, etc., etc.

12. Have you any public water works? Do you require cisterns to receive water from roof, or what provision must be made for water service? Also give full particulars of drainage. Can yours connect with a sewer in the street or must a cesspool be provided, and state whether the ground has a bottom of sand, gravel, hard-pan or clay.

13. What fence and outbuildings are required?

14. Name any work and materials you wish to do or supply, so that they may be mentioned in specifications.

Write your name and address legibly, giving your post-office, county and State, and write your own name at the bottom of your letters.

After receiving particulars, anything that will interfere with the proper arrangement of the rooms, and the carrying out of a suitable design, will be brought to your notice, and we shall correspond with you until everything will harmonize. We do not wish to send out designs when we think they will not give satisfaction.

Correspondence invited from those who contemplate building, which will always receive our prompt and careful attention.

When we are employed by parties at a distance we make preliminary sketches of floor plans, and usually with this we send a small free hand sketch of the elevations. These we send to the client, and they are returned with whatever alterations, corrections and suggestions he makes. Then we make the changes suggested as far as proper and send again to the client for final approval if necessary, and when our sketches show just what is wanted by our client to meet his necessities and desires, we make the working plans, detail drawings and specifications, etc., as required for the builders to work from. Parties who wish to employ us should not wait until the last moment, but should open correspondence with us two or three months, or even more, before they wish to commence building.

Our charges for services are for full working plans, all detail drawings for exterior and interior work and fittings, specifications and forms of contract, two and a half per cent on cost of erecting and completing building, and, where parties are unknown to us, one-quarter of said charges usually accompanying the order for preliminary sketches, and as a guarantee of good faith.

In addition to above rates, one per cent is charged when elaborate sketches and perspective in line or color are required to be made previous to making full working plans; also one per cent additional when there is a large amount and variety of elaborate interior wood work and fittings to design in detail for first-class dwellings, mansions, etc.

For preparing complete bills of quantities of materials, a charge of three-quarters per cent is made.

For superintendence, one and one-half to three per cent, according to the requirements, or by the visit by special agreement for inspecting the work to see whether contractor's payments are due or not, and that he is fulfilling the conditions of the contract.

When required, we furnish our client with a competent and reliable clerk of works to be constantly on the ground superintending the construction, and which is very necessary in the case of large or intricate buildings.

For designs in detail of Furniture and Interior Decorations, ten per cent on cost.

For buying material and appliances required in building and furnishing, such goods in all cases being bought at the best wholesale trade rates, a charge of five per cent is made.

For appraising and valuing, charges are made according to time occupied and circumstances.

Traveling expenses and surveying in all cases are charged in addition to above rates.

Charges are based on the total cost of actual execution and payment of full value, but previous to ability to arrive at the proper and full cost, the approximate intended cost is used as the base on which to reckon charges.

It is our constant aim to please our clients, and we usually succeed. Our long practice has convinced us that it is quite as easy to satisfy parties with our designs when we never see them, as in any other way. When parties correspond with us in regard to procuring designs, we are always prompt in answering their inquiries: but ofttimes people have written us simply to get our ideas and not pay for them. To all such we would say that our time is valuable, and we sincerely wish they would not trouble us. We mention this fact because we have received scores of letters, and answered them, when the parties really never intended to employ us, but simply steal our ideas. Now our ideas are for sale, and by this means we live, and it is a pleasure as well as a livelihood to assist people to build artistic, convenient and comfortable homes. Perhaps if architects were rich—they seldom are—it would be sufficient compensation to them to assist people as far as possible with ideas; but as they are not, they are obliged to combine pleasure and profit in a way it is seldom done except in architecture.

When you want a lawyer, do you ask all the attorneys you know to make a "bid," and then employ the cheapest? Do you not rather look for the attorney whose skill, knowledge of the law and personal character insure thorough and honest effort in your interest? Level-headed business men seek the best legal talent; in their judgment the best is the cheapest, and it should be just the same in regard to the employment of architects, yet many think that the least they can get a design for is so much made. This is a great mistake, and is admitted by all intelligent men. It is impossible to get anything for less than its value, and at the same time have it prove satisfactory. It is but a very small design that will occupy a week's time in its study, and the proper preparation of the drawings and specifications.

We shall be very glad to hear from all persons who intend to build, and wish our services, and we will serve them faithfully.

Our aim is to please our clients, and to give just as much for their money as possible.

It may seem a curious fact, but to design a small cottage, and get the most for a limited cost, is a much harder study than to design a house to contain so many rooms, and have this and that, where we are not limited to cost.

Our drawings are made on vellum, so that they will stand wear and tear; are thoroughly lettered, figured, and made plain as daylight. Also, any one can understand our full-size working drawings. The specifications are always made complete in every particular, and are furnished in duplicate, for builder and proprietor, as are also our forms of contract; and all instructions are given our clients in the most complete way to enable them to have the design properly executed, and their building affairs satisfactorily conducted.

To those who need our services, we would say that our aim at all times is to produce what will in every way give satisfaction, and our services, advice, etc., are rendered in full confidence that they will do so.

You will do us a favor by showing this book, or speaking of it to your friends and any one in your locality who intends to build or is otherwise interested. We have the honor to be yours most respectfully,

PALLISER, PALLISER & CO.,
ARCHITECTS.

DESCRIPTIVE PRICE LIST.

For full Working Plans, Detail Drawings and Specifications, with any changes and alterations to suit local requirements, for each of the designs contained and illustrated in **"Palliser's Court Houses, City Halls, Jails, and Public Buildings of every Description, for Villages, Towns, Cities, Counties, etc."** *Specifications are furnished in duplicate and properly arranged for Committee and Builder. A full supply of Contract Blanks with Bond, so as to fill out and make proper agreement with builder, furnished free.*

Description.	Page.	Plate.	Prices of Plans, Etc.
Court House,	7 to 38	1 to 29	$350
A $50,000 Court House adapted for Southern States, tower in center of main front,			450
County Record Office,	39	30	75
Court House,	39	30	55
Court House,	40 to 45	31 to 36	750
Court House,	46 to 51	37 to 42	1,400
Court House,	52 to 54	43 to 45	750
Court House,	55 to 57	46 to 48	400
Western Court House, basement and 2 stories, for center of block, cost $50,000,			450
Court House,	58 and 59	49 and 50	200
Court House,	60 and 61	51 and 52	200
Jail,	61	52	55
Court House,	62	53	150
Prison Buildings,	63 to 65	54 to 56	300
Jail,	66	57	125
Small Village Hall,	67	58	15
Model Village Hall,	67	58	$50
Hall for Societies,	68 and 69	59 to 60	150
City Hall,	70 and 71	61 and 62	450
Town Hall,	72 and 73	63 and 64	250
City Hall,	74	65	200
Public Hall,	75 to 77	66 to 68	75
Town Hall,	78	69	125
Stores and Town Hall,	79	70	55
Exhibition Hall and Rink,	80	71	100
Village Hook and Ladder and Trustees' Offices,	81	72	45
Town or Village Offices,	81	72	60
Lunatic Asylum,	82 and 83	73 and 74	750
Capitol Building,	84 to 91	75 to 80	1,650
Library Hall,	92	81	115
Armory,	93	82	165
Armory,	94 and 95	83 and 84	325
Band Stand,	96	85	25

Mr. F. A. Hopkins, Prestonsburg, Ky., writes as follows, regarding Floyd Co., Ky., Court House, for which we furnished working plans, detail drawings and specifications:—

MESSRS. PALLISER, PALLISER & CO.:

Gents—Our Court House contract was let as a whole for $15,100, and is progressing nicely. All who have seen plans, etc., say it will be a better house than the county of Pike, adjoining us, has, which was just completed at cost of $25,000, under plans of ———, Architects, of Louisville, Ky.

Yours, etc., F. A. HOPKINS.

A Few Opinions of the Press.

Palliser's Court Houses, City Halls, Jails, etc., is a volume eminently useful to a large class of county and municipal officials in all parts of the country. New buildings of the description referred to are constantly being erected or projected, especially in the newer States; and the authorities who have charge of such enterprises are called upon to determine, in a very large measure, the standing of their respective communities in the matter of public architecture. A new court house or city hall, by virtue of its prominence as a feature of the town where it is built, and of the fact that it must remain and characterize the locality for many years, ought to be a structure of which neither the county commissioner, the city councilman, nor the public-spirited taxpayer need be ashamed. The book here mentioned is a valuable aid in arriving at satisfactory results in these undertakings. It is a large and handsomely printed volume, containing nearly 100 plates.—*Mechanical News.*

Palliser's Court Houses, City Halls, Jails, etc., is a welcome addition to the *Register's* library. The Builders' Series, No. 2, is a neatly bound volume of 108 pages, containing a number of finely engraved plates of court houses which have been designed by Palliser, Palliser & Co. A most valuable feature of the publications are the elevations, scaled details, specifications and estimates, which may be used to great advantage by the practical builder.—*Building Register.*

We have received a copy of Palliser's latest publication, designs and plates for court houses, city halls, jails, etc. This volume is in line with the "Standard Works on Architecture," and very valuable to those interested in this class of buildings: the subject is exhaustively treated, and the information contained in a small space, making it a valuable guide to officials or communities contemplating the erection of public buildings.—*Builder and Woodworker.*

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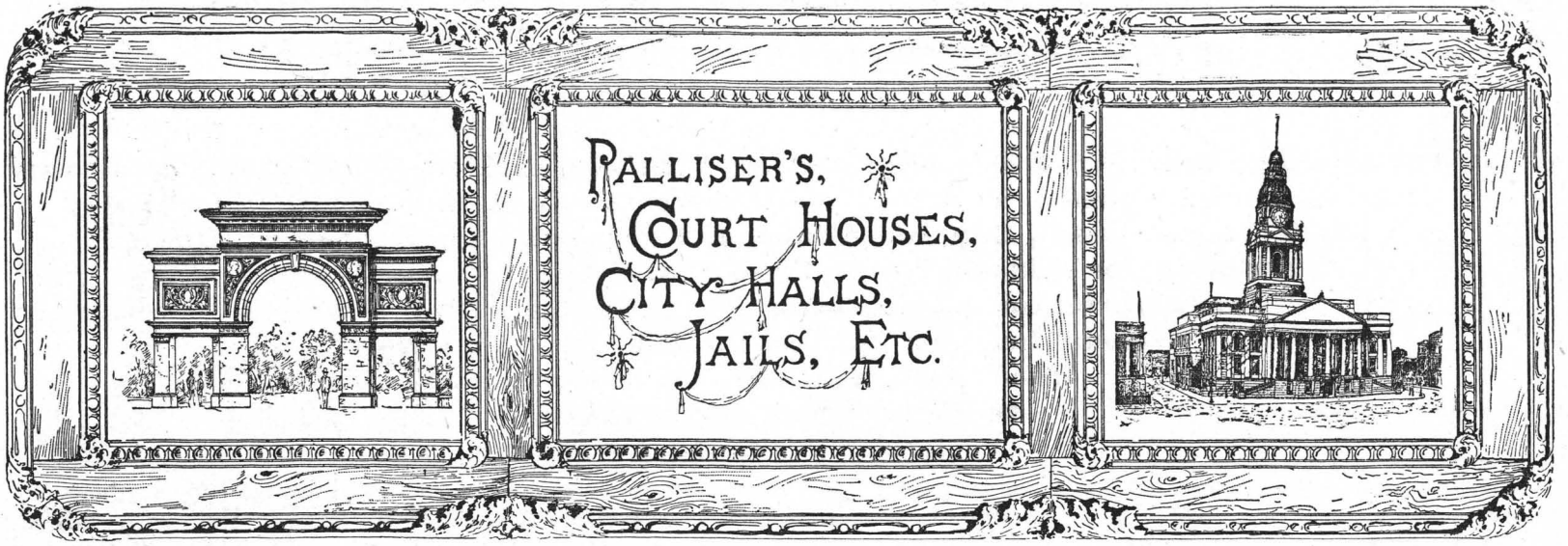

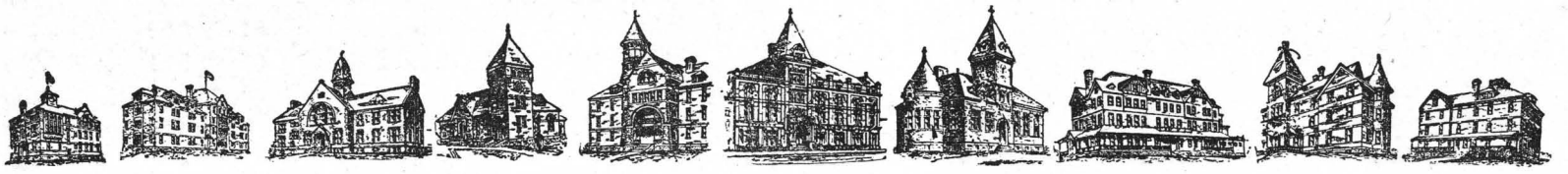

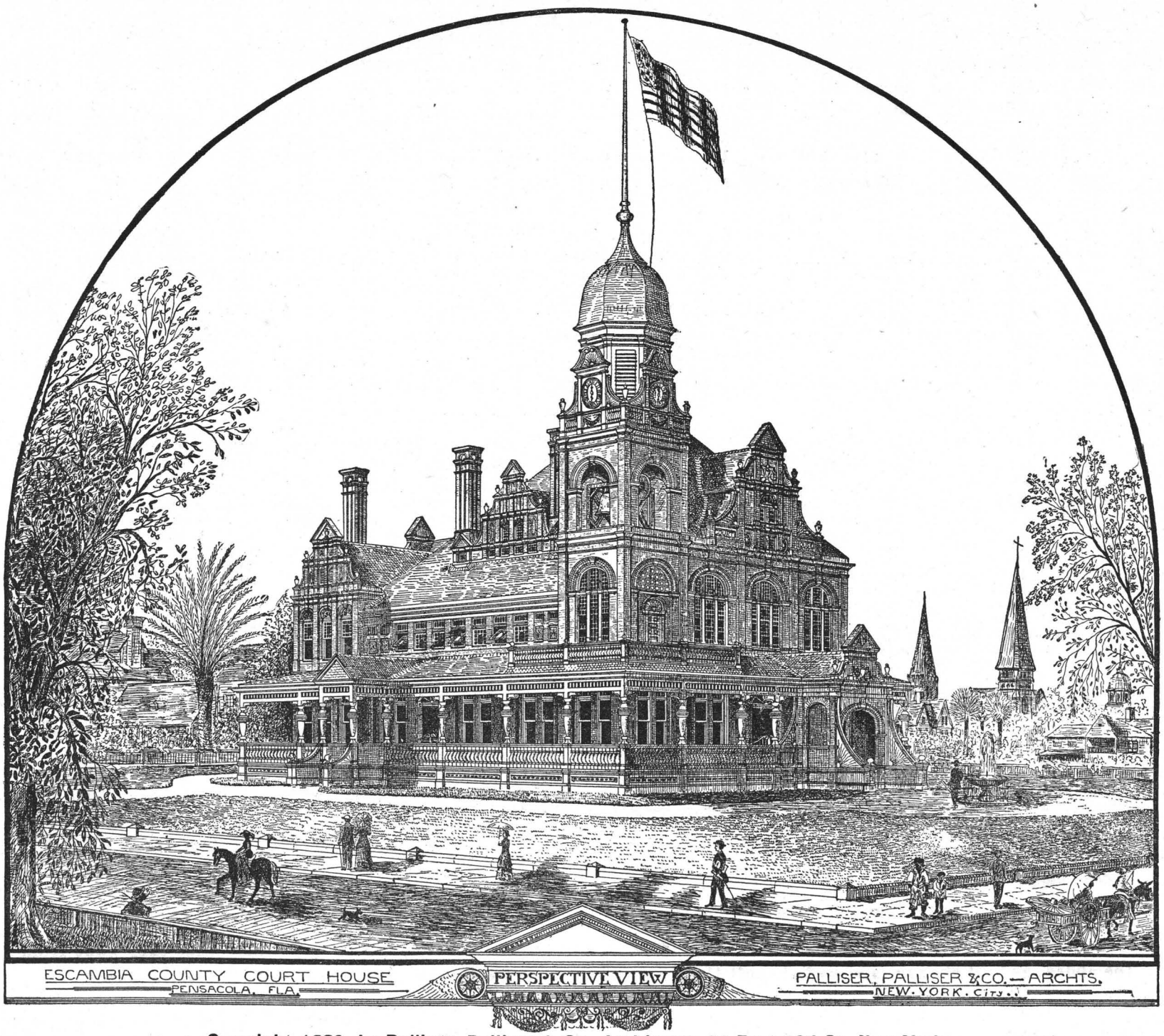

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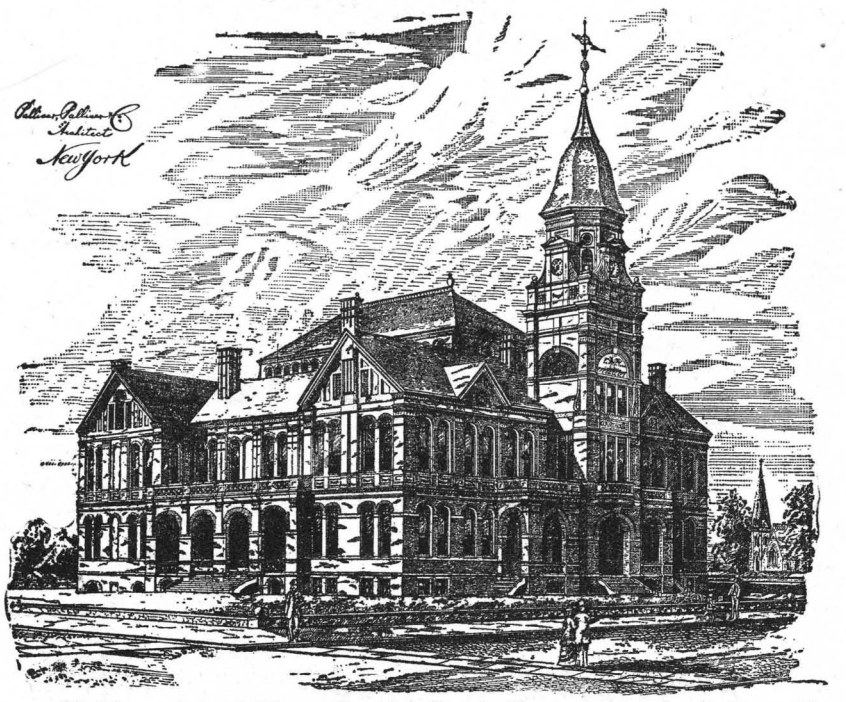

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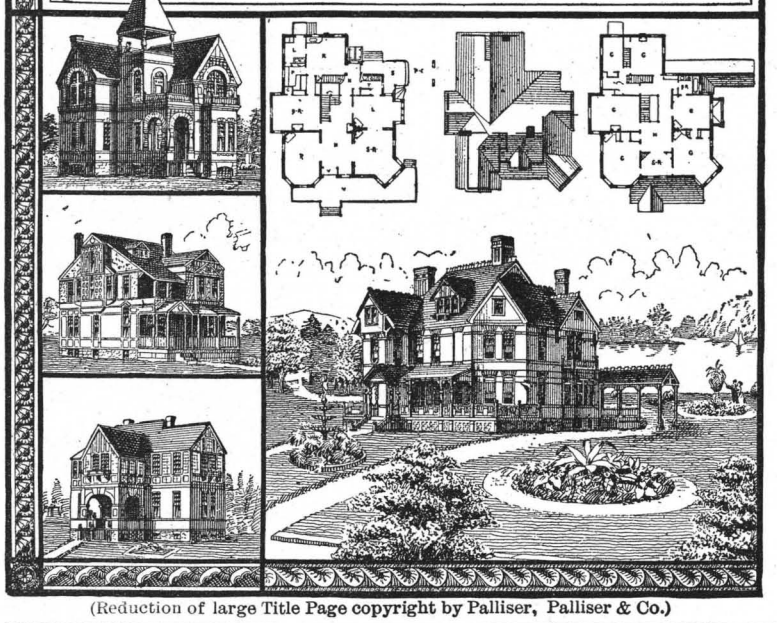

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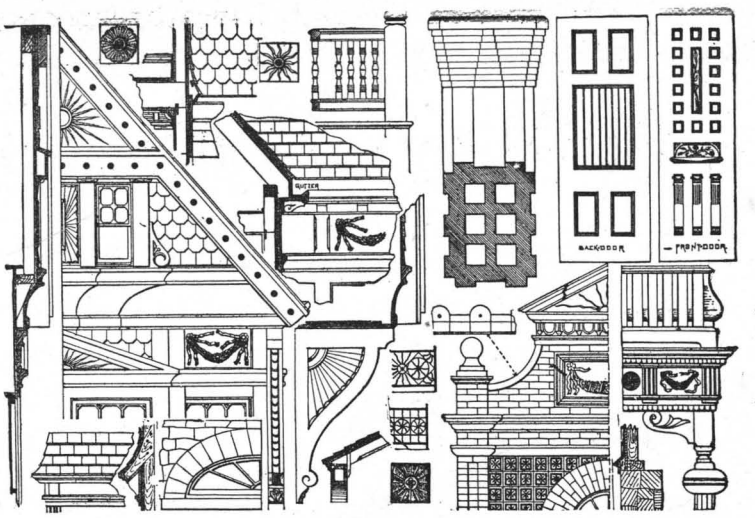

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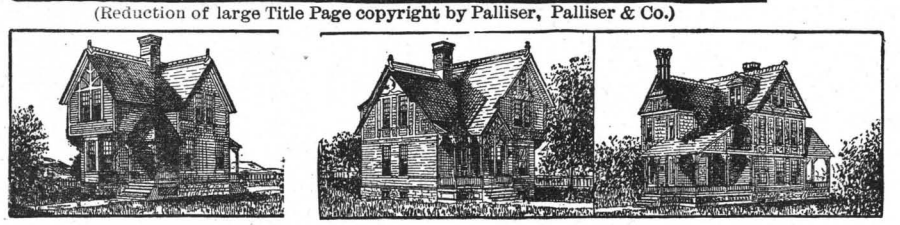

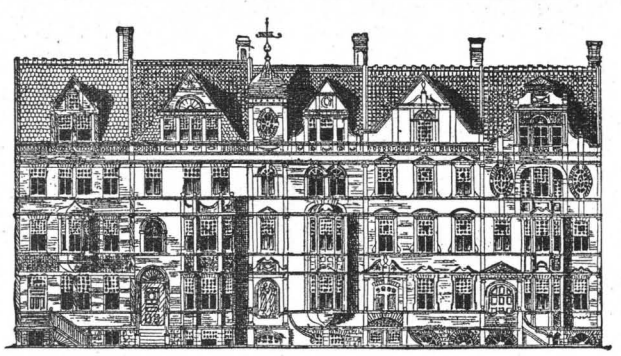

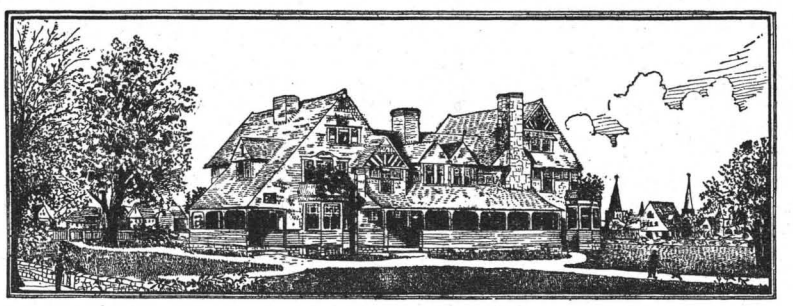

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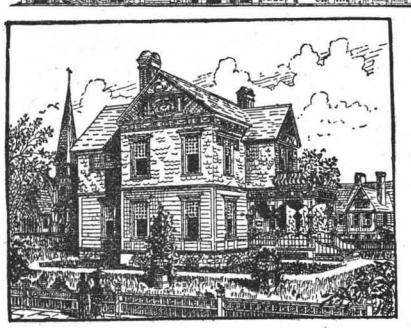

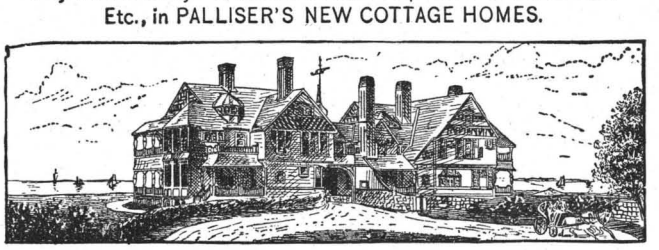

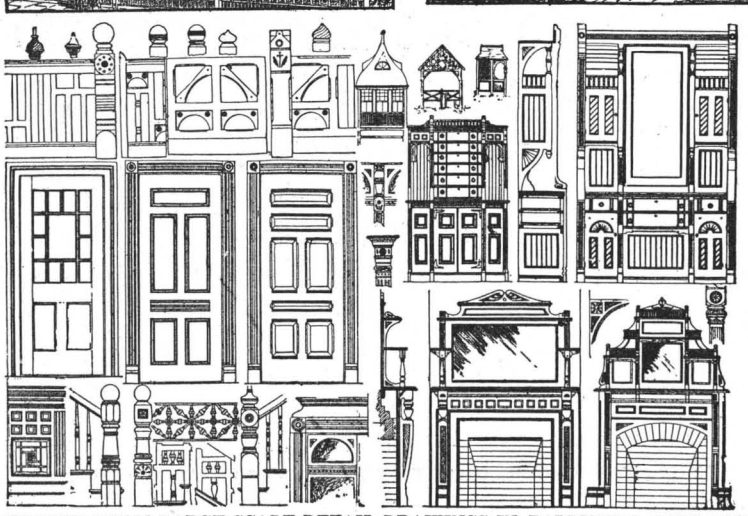

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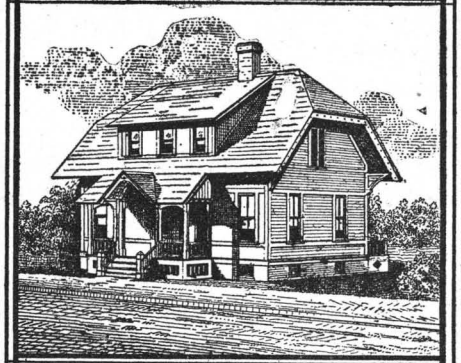

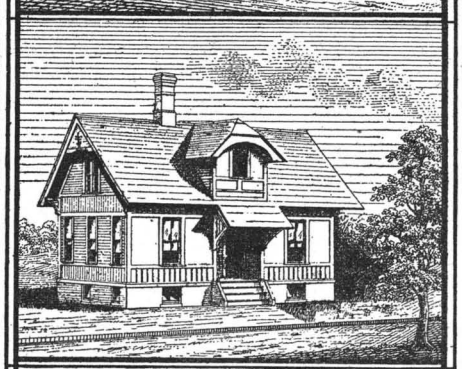

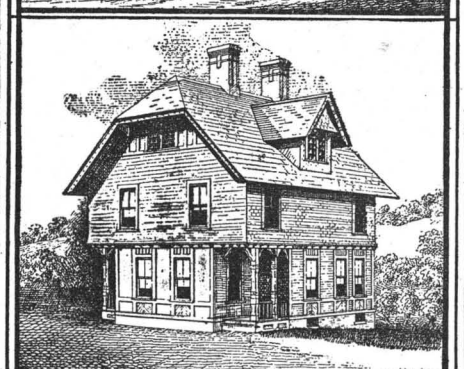

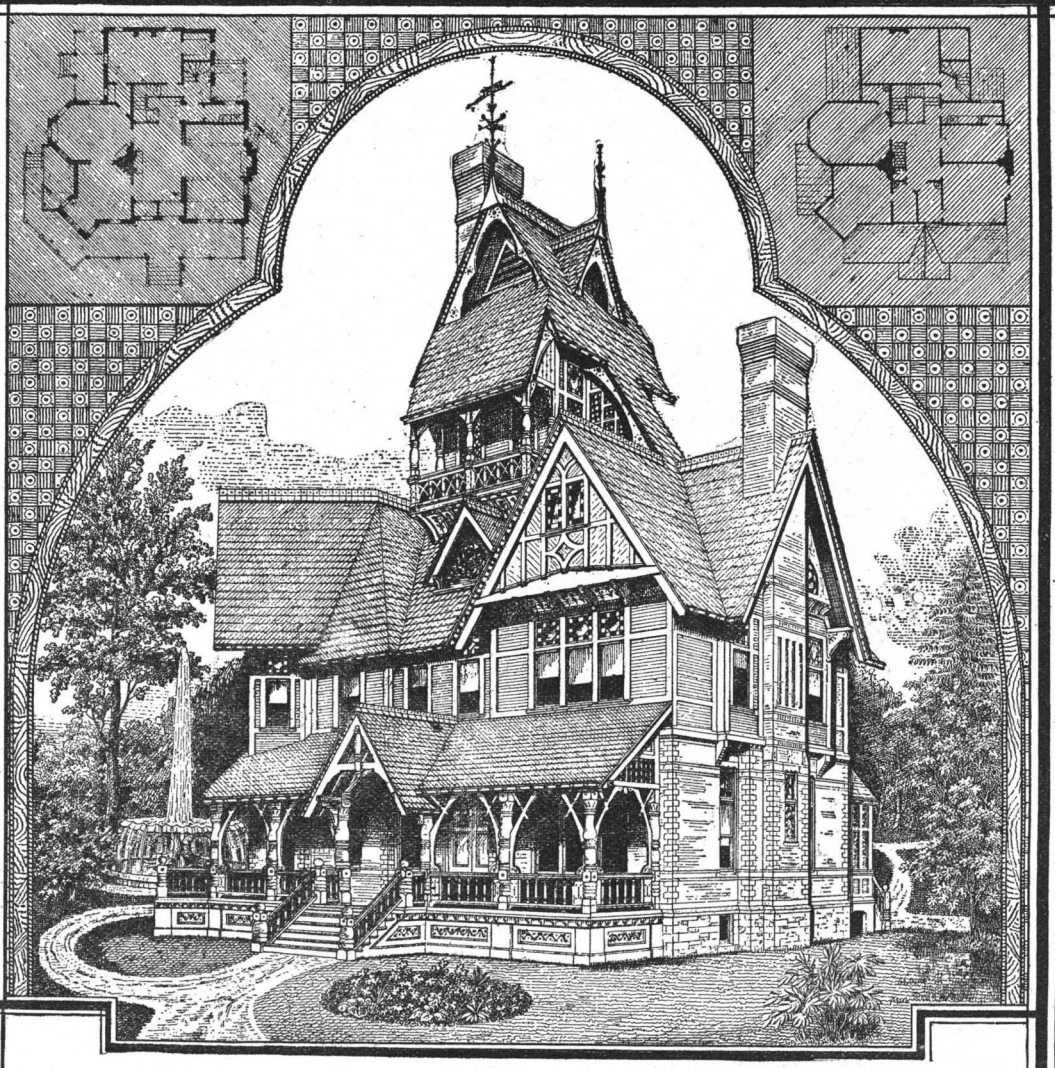

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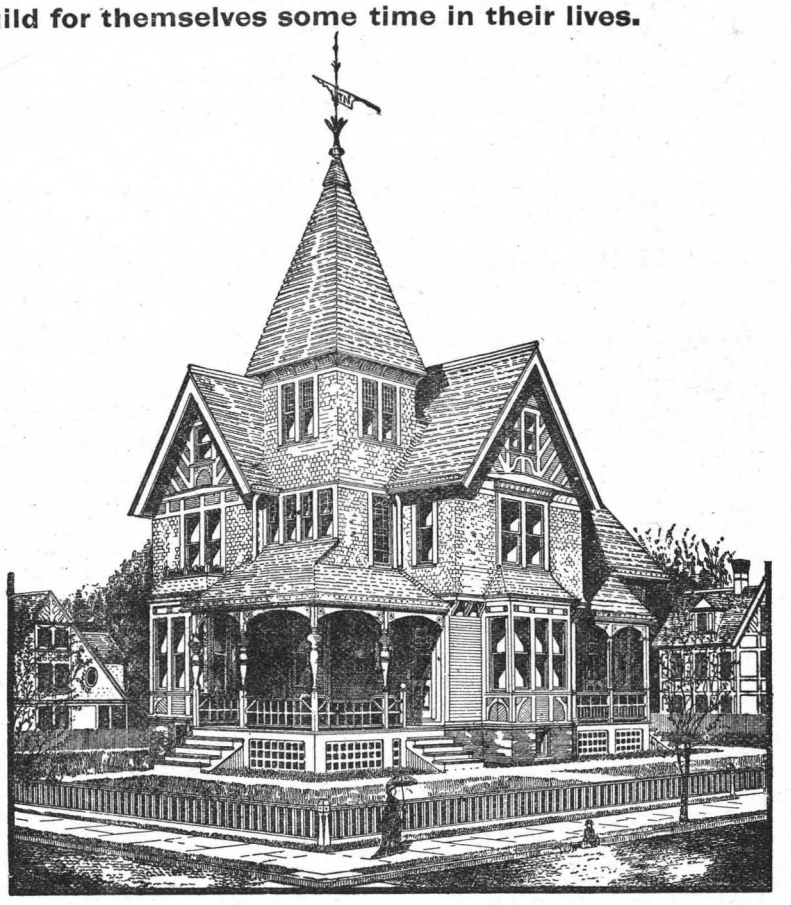

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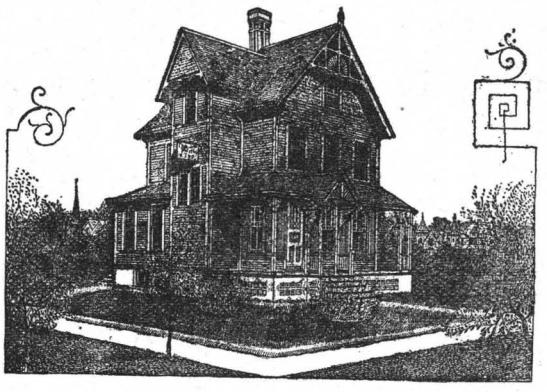

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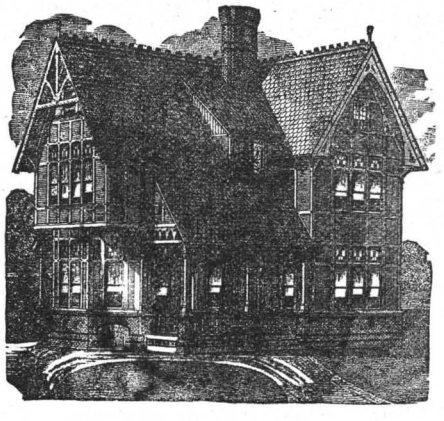

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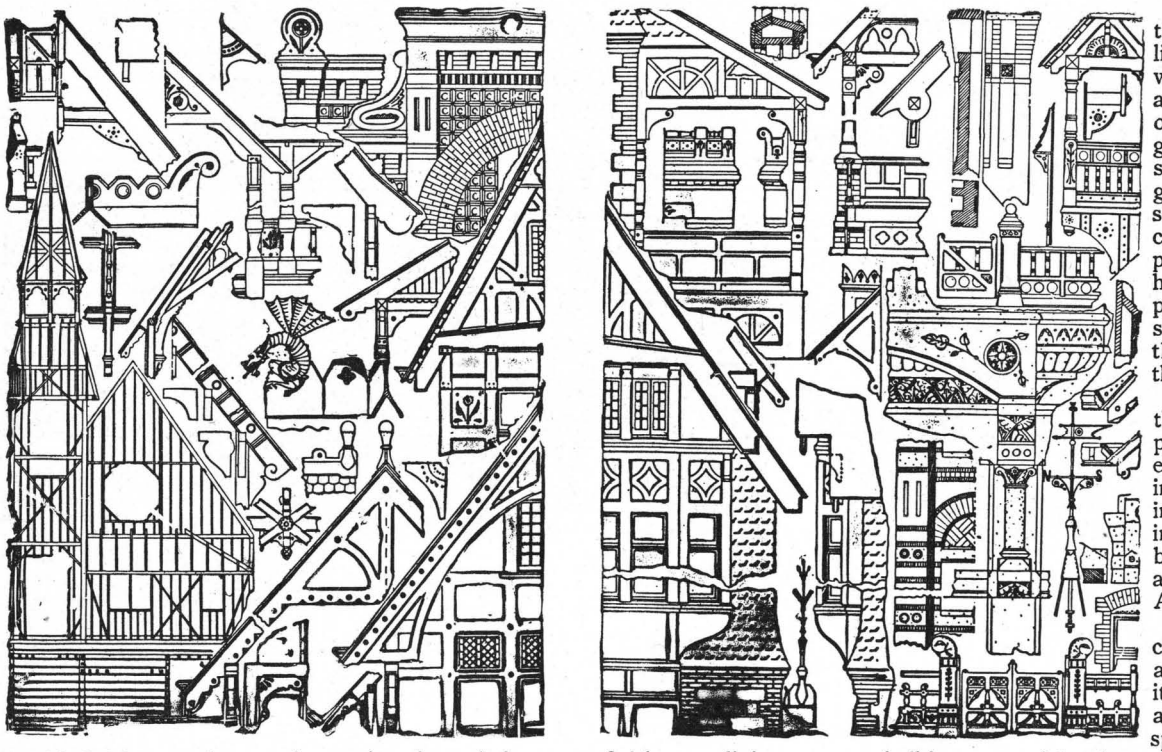

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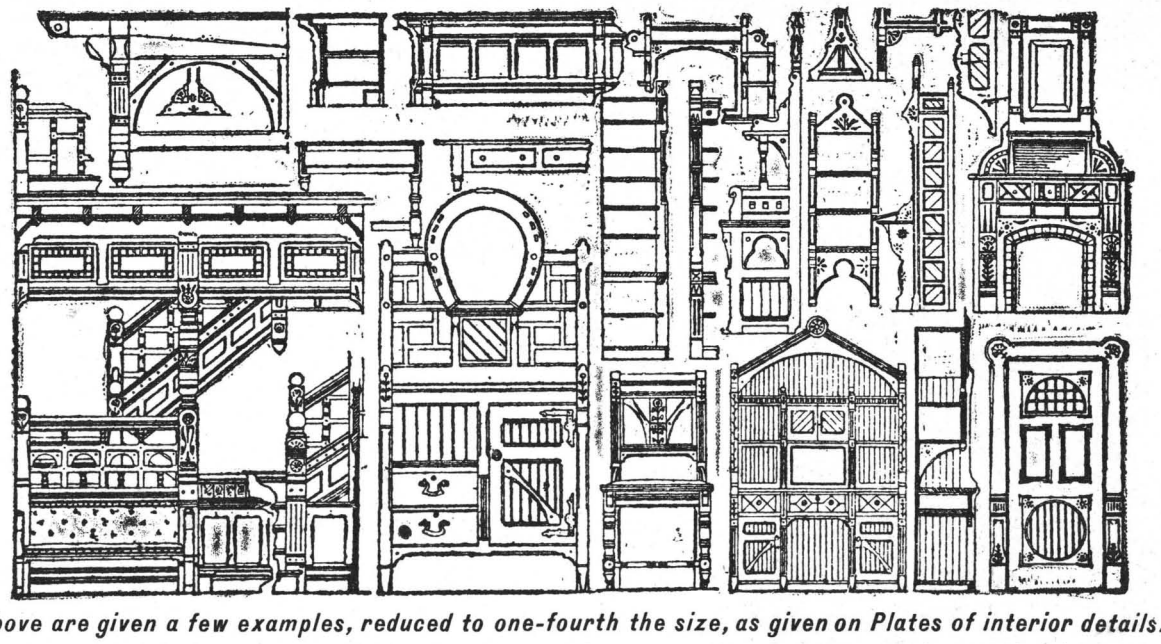

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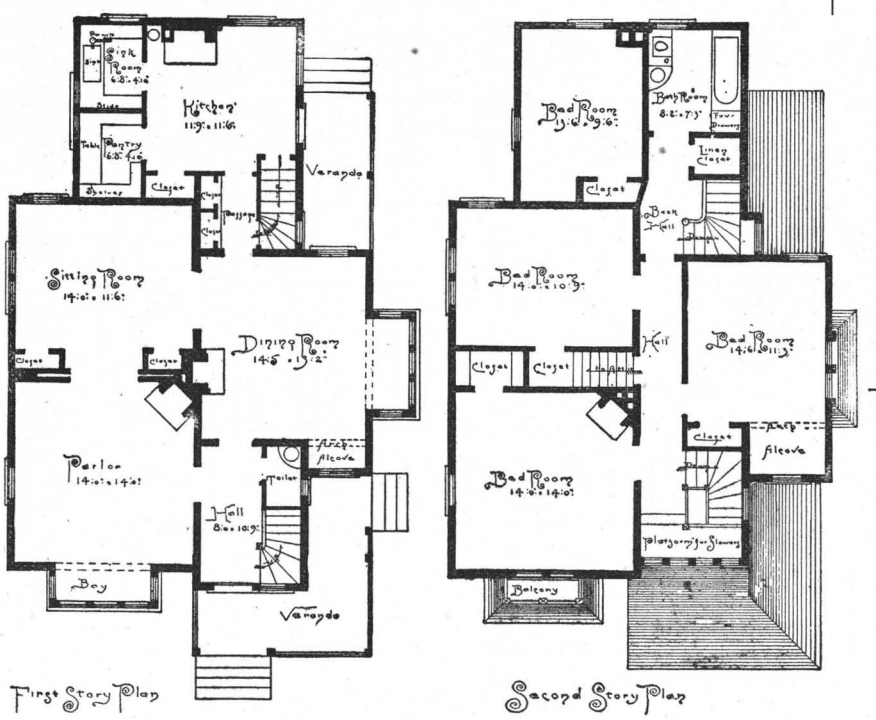

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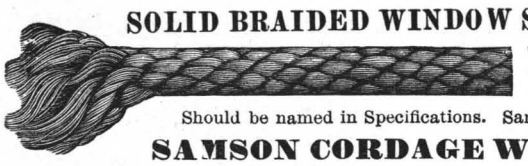

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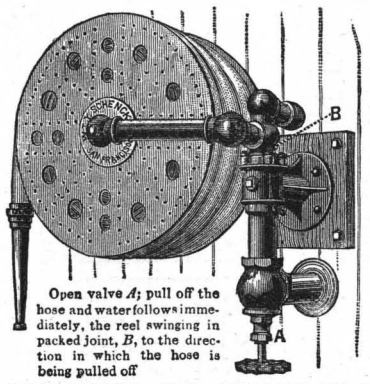

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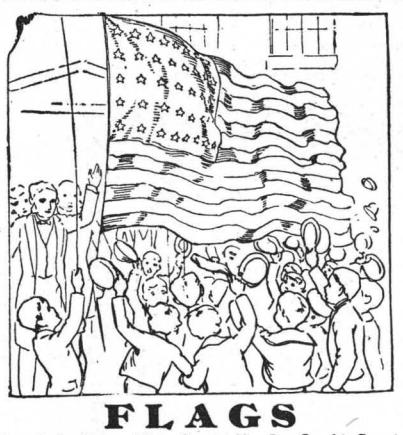

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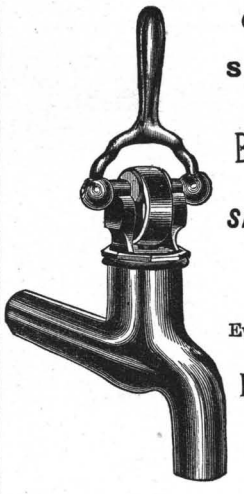

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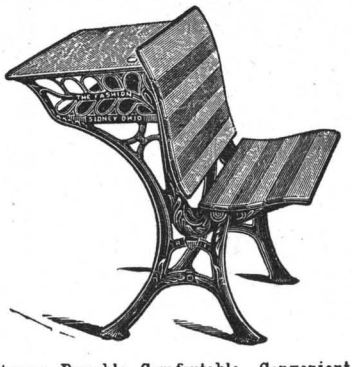

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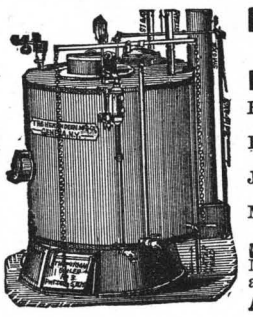

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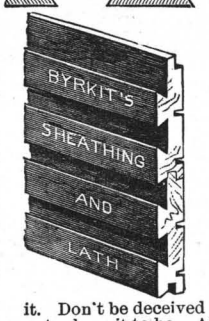

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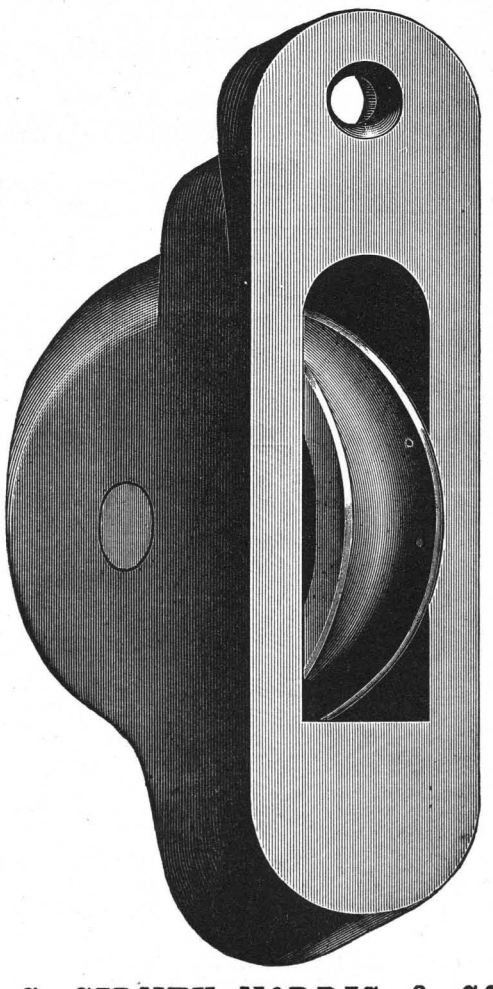

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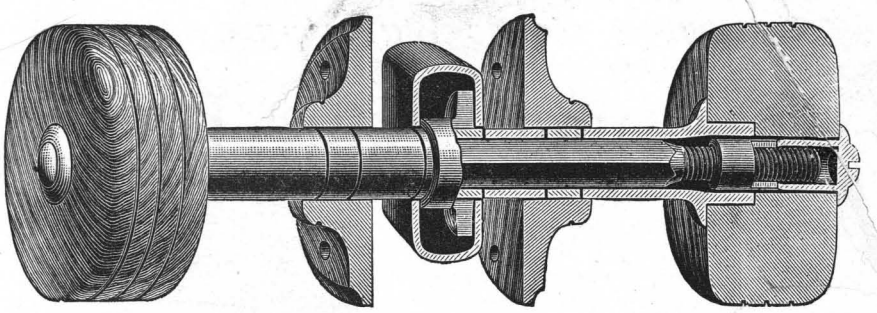

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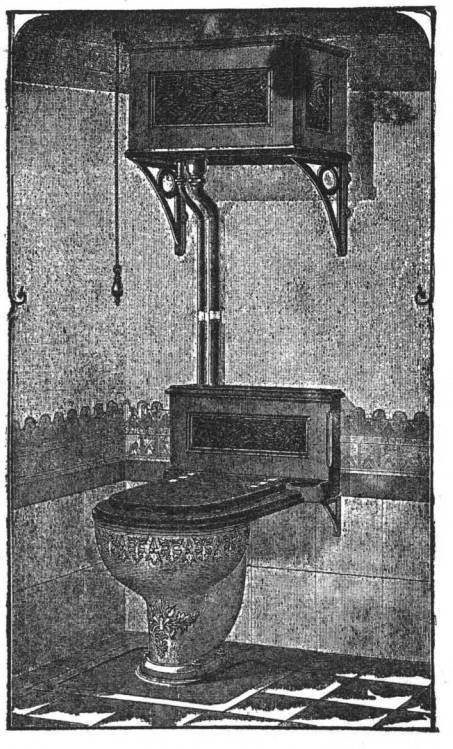

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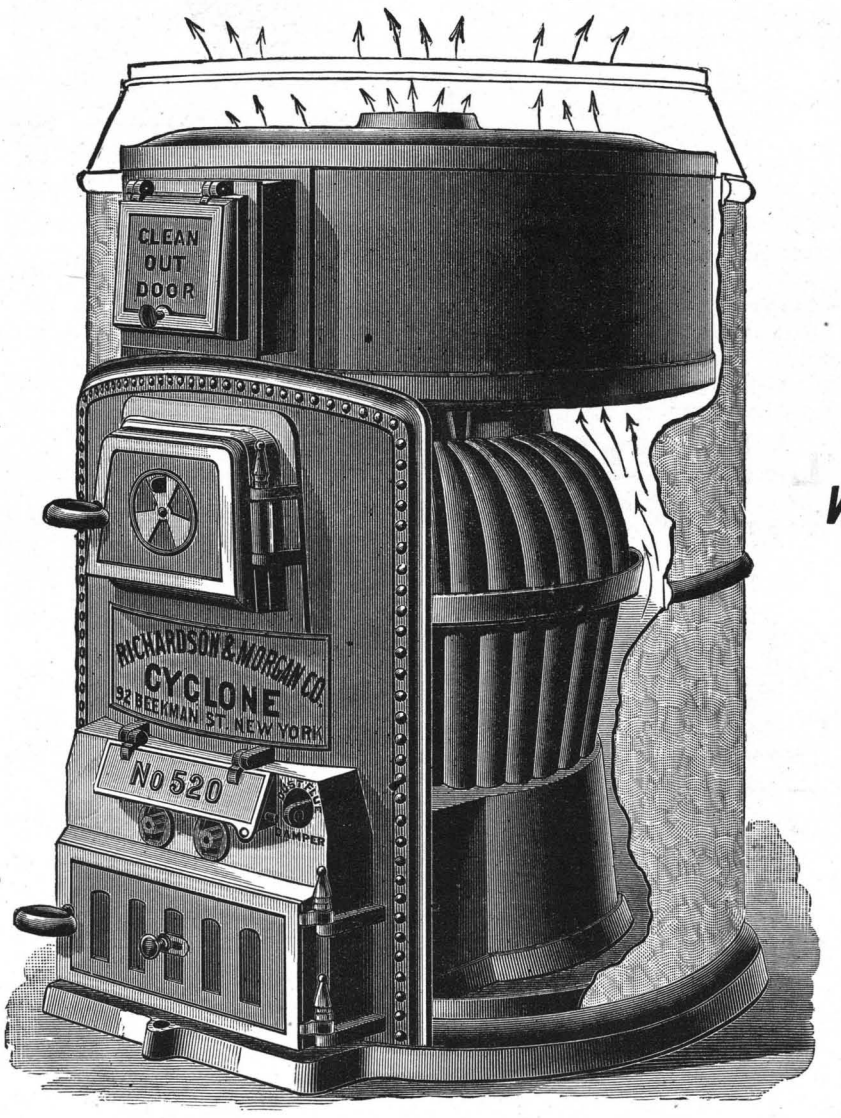

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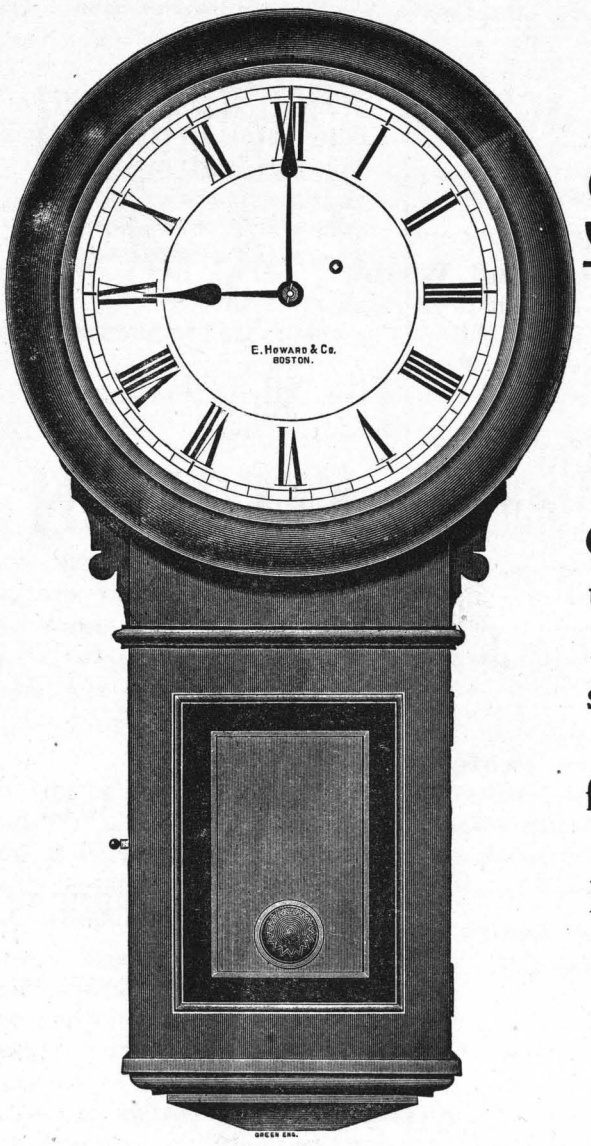

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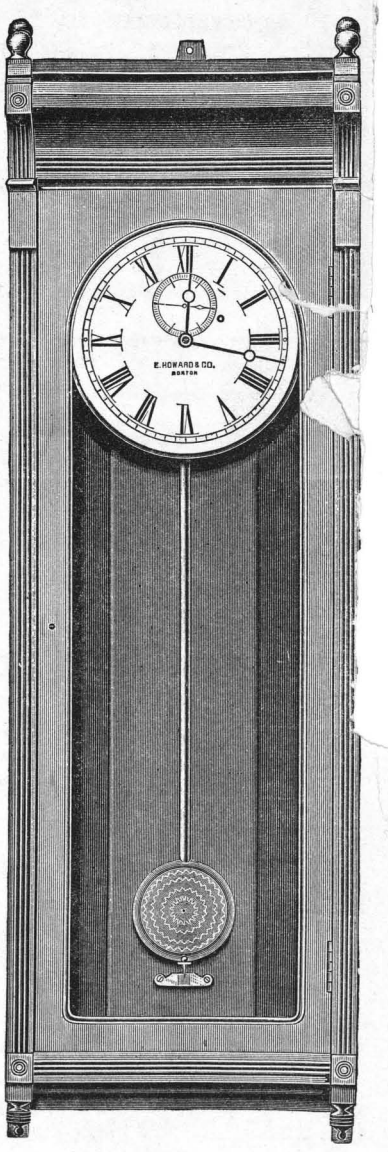

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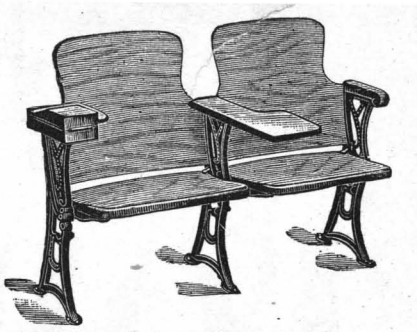

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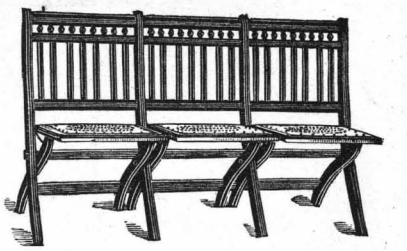

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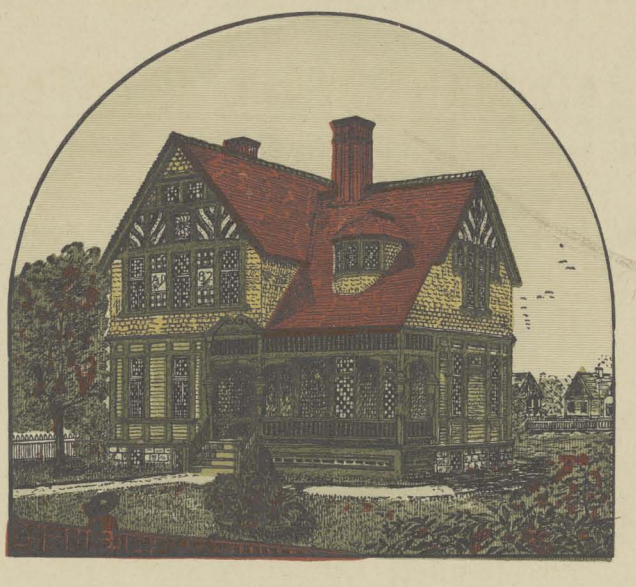

THREE
WHITES-INSIDE
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THE LAST GIVING
A HIGH GLOSS

SEVENTY FOUR HANDSOME COLORS OR TINTS

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LUCAS BRICK COLORS

THREE SHADES OF BRICK RED. **TWO SHADES OF WESTERN BRICK.**

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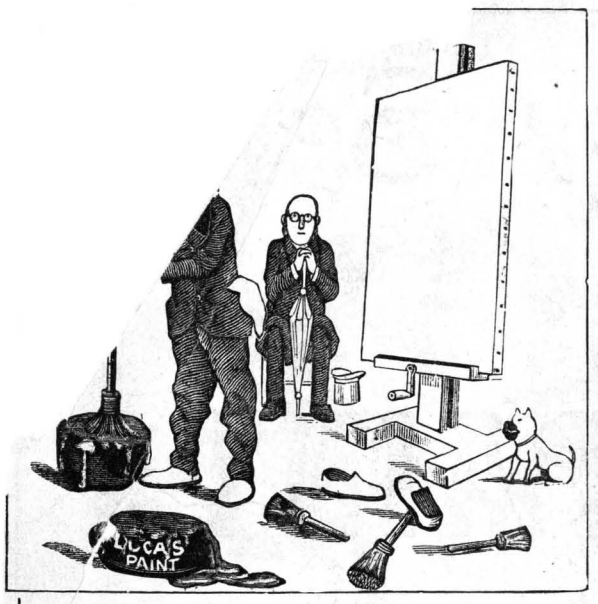

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FILLS, STAINS
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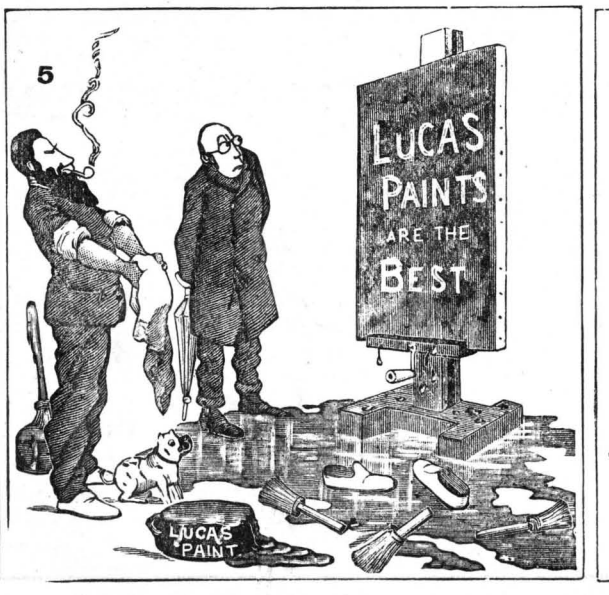

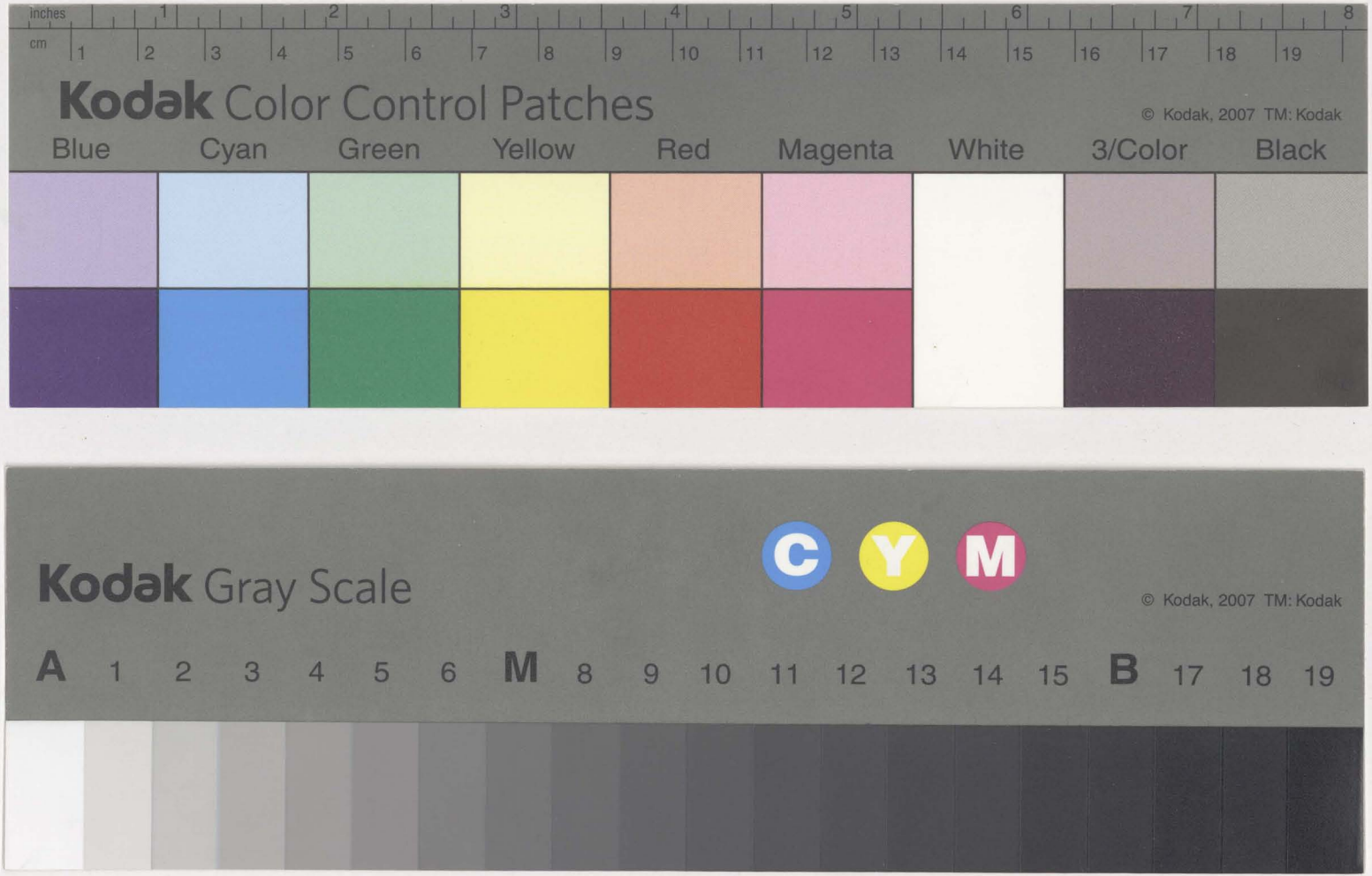
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