

Letter from Alexander Graham Bell to Gardiner Greene Hubbard, January 21, 1877, with transcript

18 Beacon St — Boston. Jan. 21st, 1877. Dear Mr. Hubbard,

I cannot help writing just to tell you how fast we are progressing with the new for of Telephone.

By increasing the resistance of the coils — by converting the cover into a sounding-box — and by supporting the magnet upon rubber — we have increased the loudness of the sounds so much — that they are audible all over my experimental room.

The articulation can be distinguished with the ear two feet away from the instrument. Last night two Japanese gentlemen held a conversation in Japanese through the instrument — and this morning Mr. Watson went to Salem and conversed with me through the wire — without any battery.

Not only was the articulation intelligible — but the tones of the voice were audible all over the Telegraph office.

I was able to understand the articulation — at a distance of six feet from the instrument by placing my ear against the table upon which the telephone stood. The power we obtain from these instruments is marvellous beyond belief. — We were able to hold conversation this morning between Boston and Salem with wires of only four ohms resistance ! The resistance of the line and relays upon it must have been not less than 500 or 600 ohms.

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In spite of there being no battery we were annoyed by sounds of operating and made experiments to determine the cause of such sounds.

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Fearing that some current from another line was leaking on to ours by the earth connections — we made a metallic circuit to Salem without any ground wires — by using two lines as shown in the diagram — and still we heard the sounds of operating upon other lines. The cause is therefore evident. The other wires were carried on the same poles with ours and parallel to them — so that an inductive action was exerted by one wire upon the other.

I was glad to notice that as we increased the resistance of our Telephone-coils — the vocal sounds became louder and the sound of operating feebler. I believe we can make the vocal sounds of almost any loudness we desire by increasing the resistance of the coils of the Telephone sufficiently.

My foot is almost well although I am afraid to use it much — I shall be careful.

I was able to go to Cambridge this afternoon to see May. Miss Blatchford's arm seems to be progressing satisfactorily.

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With much love to you and Mrs. Hubbard, Yours respectfully, A. Graham Bell. Hon. Gardiner G. Hubbard, 711 Fourteenth St — Washington.