

ELISHA GRAY,

220 KINZIE STREET,

Chicago, March 7, 1878.

Dear Pope:

An idea just occurs to me in connection with the re: issue, which I wish to present to you for your consideration.

Early in my experiments with reference to transmitting telephonic vibrations electrically, I discovered, that there was a great advantage, in the matter of receiving vibrations, to have the receiving magnet partially charged from an extra battery or from extraneous force other than the electrical vibrations themselves.

For instance in 1876, I made an experiment on two hundred miles circuit as follows: I put a transmitter at one end, tuned to vibrate at a given rate per second, and a receiver at the other end tuned at the same pitch. I then ^{inserted} ~~connected~~ twenty-five cells of battery in

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in the circuit, putting a shunt wire around it, in which was placed the transmitter, in the manner shown in my multiple circuit patent.

I set the vibrator in action and then adjusted the receiver as nicely as possible, but could get no perceptible effects. I then added in the circuit an additional battery of fifty cells, as shown as A in the diagram, which I enclose, still vibrating the twenty five cells only. Immediately the receiver was thrown into strong vibrations.

You will perceive that I had a permanent charge of fifty cells in my receiving magnet, while the twenty five cells were broken in vibration as before.

This fact I have observed frequently from time to time, but it did not occur to me to claim it

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until now, although you will see that the conditions are shown in the patents we propose to re-issue.

This phenomenon was noticed in a marked degree in my first pair of battery telephones, known as the supplemental magnet telephone.

You will remember, that in these instruments no battery is connected to line, and that locals are only used at each end to charge the magnet.

When I first connected them up, I put a battery on the transmitting instrument only, it not then occurring to me that it would be necessary to charge the receiving ^{magnet.} ~~instrument.~~ But in this position we could get nothing through the circuit and it was only when we put a battery on the receiving end that we could hear the voice of the transmitter. After an instrument has had

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battery through it, it retains a slight charge; and a slight effect can be produced without the battery, but is very feeble.

The loudness increases as the charge increases to within certain limits.

This experiment I have tried repeatedly with the same results each time. From all this I argue that the permanent charge of the receiving magnet in the speaking telephone system is a vital point.

This as you will know may be obtained in two ways - by means of a battery and by permanent magnetism.

Why cannot we claim an electric magnet, for receiving telephonic vibrations, permanently charged. If such a claim can be had and made to hold, it

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will control all the speaking telephones that we now know any thing about.

I can date back at least for this experiment to May, 1874.

Please give this your earnest consideration and report.

I send a copy of this letter to Mr. Baldwin of Washington.

I suppose it will have to be claimed in some of the patents issued; or can we get it under head of new patent?

I do not know just what "public use" means, and whether we should be barred from making a new application on the ground that it had been in public use more than two years.

Yours truly,
Elisha Gray