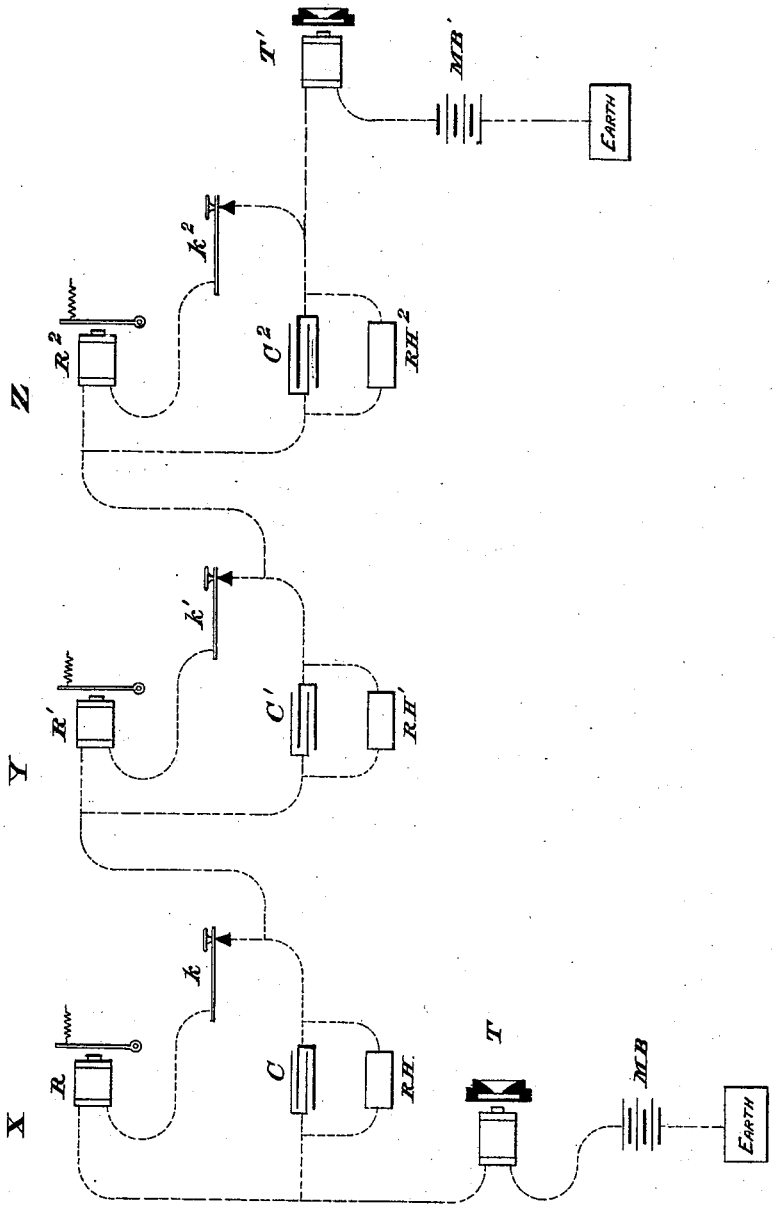
E. GRAY.

Speaking-Telephone Apparatus.

No. 212,373. Patented Feb. 18, 1879.



WITNESSES

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UNITED STATES PATENT OFFICE.

ELISHA GRAY, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN SPEAKING-TELEPHONE APPARATUS.

Specification forming part of Letters Patent No. **212,373**, dated February 18, 1879; application filed April 24, 1878.

To all whom it may concern:

Be it known that I, ELISHA GRAY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in the art of transmitting telegraphically vocal sounds or articulate speech, and in apparatus for so transmitting such sounds or spoken words, of which improvements the following is a specification:

In Letters Patent No. 198,738, granted to me January 1, 1878, for improvements in Morse telephonic telegraphy, I have shown an apparatus for simultaneously transmitting through the same electric circuit ordinary Morse signals and telephonic or vibratory signals or rhythmical undulations.

My present invention relates to and constitutes an improvement in the art, system or method, and apparatus described in the aforesaid patent; and its object is to transmit spoken works or articulate sounds through an electric circuit upon which Morse messages are simultaneously being transmitted, which ends I attain by substituting for the vibrating-reed transmitters shown in said patent a speaking telephone or telephones, as hereinafter more fully set forth.

The subject-matter claimed will hereinafter specifically be designated.

The arrangement of apparatus at the way stations under my improved system is precisely the same as that shown in the Letters Patent above mentioned, the line being divided into branch circuits, with a Morse relay in one branch, and a resistance-coil and condenser in the other, the resistance shunting the condenser, and the Morse key shunting both the resistance and condenser, as fully described in said patent.

The telephone transmitting apparatus at the way stations is removed and speaking-telephones (placed directly in the circuit) substituted therefor. The Morse relays are worked precisely as in the patent above mentioned, while at the same time the speaking-telephones may be used between any two or more points in the line, which line is worked on the closed-circuit plan—that is to say, with a continuous current from the main battery flowing through the line and keeping the magnet permanently charged. When any key is open in the line the telephonic vibrations pass through the condenser and resistance-coil, so that there is always a passage for the vibrations, whether the Morse apparatus be worked or not.

The accompanying diagram represents a convenient arrangement on circuit for carrying out the objects of my invention in the best way now known to me; the details of construction and arrangement of the apparatus obviously, however, may be varied, in various well-known ways without departing from the spirit of my invention.

In this instance but two terminal and three intermediate stations are shown; but it is obvious that the same system may be applied to any number of stations, and the details of arrangement be greatly varied, so long as the gist or principle of the invention is preserved, which is that of a branch circuit, with the Morse apparatus in one branch, and a condenser and resistance-coil or rheostat in the other.

MB MB′ represent main batteries, which may be used either at one or both ends of the line. T T′ represent telephone transmitters and receivers, through the magnets of which a continuous current constantly flows from the main-line battery, thus keeping them permanently charged.

The arrangement of apparatus at each intermediate station X Y Z is the same, the line dividing into branch circuits, as shown in the diagram, one of which includes a condenser, C C^1 C^2, and a rheostat or resistance-coil, RH RH^1 RH^2, while the other includes a common Morse relay, R R^1 R^2, and Morse key *k* k^1 k^2.

The operation of my improved apparatus will readily be understood from the foregoing description: Spoken words or sounds articulated into the telephone will induce rhythmical vibrations upon the line, which will be transmitted to the receiving-stations and reproduced as audible vibrations in a way now well understood. The Morse messages are sent in the usual way without interruption; but in case any key is open the rhythmical vibrations pass through the condensers, and are thus reproduced without interruption or interference.

What I claim as of my own invention, and desire to secure by Letters Patent, is—

1. The hereinbefore-described improvement in the art of telegraphically transmitting articulate sounds or spoken words, which consists in transmitting, without interruption, rhythmical vibrations representing said vocal sounds through a condenser and rheostat arranged in a branch of the same circuit on which messages on the Morse system are being transmitted.

2. The combination, substantially as hereinbefore set forth, on one wire or circuit, of Morse apparatus, speaking-telephone apparatus, rheostats, and condensers, whereby the two types of messages may simultaneously be transmitted without interference.

3. The combination, substantially as hereinbefore set forth, in an electric circuit, of one or more speaking-telephones with a branch circuit, having Morse apparatus in one branch, and a resistance-coil and rheostat in the other, whereby the resistance is cut out while the Morse key is closed, and the circuit remains unbroken when the Morse key is open, thus allowing the speaking-telephone to work regardless of the Morse instrument.

In testimony whereof I have hereunto subscribed my name.

ELISHA GRAY.

Witnesses:
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