

(No Model.)

F. R. COLVIN.
TELEPHONY.

No. 552,865.

Patented Jan. 7, 1896.

Fig. 1.

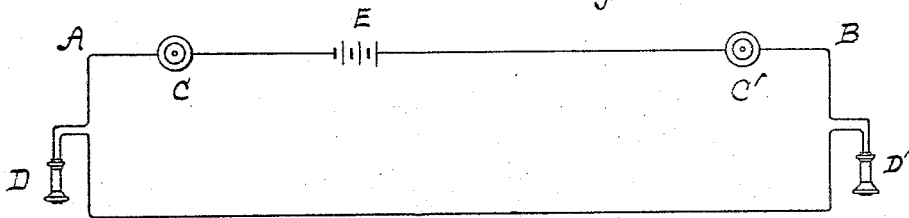


Fig. 2.

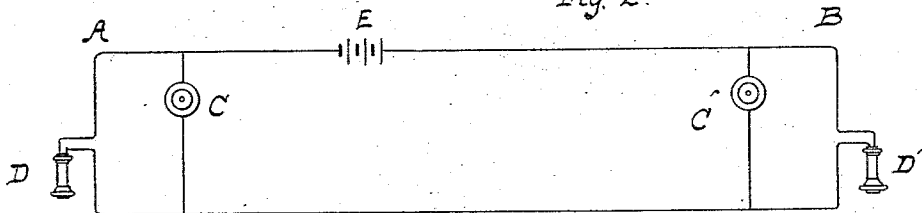


Fig. 3.

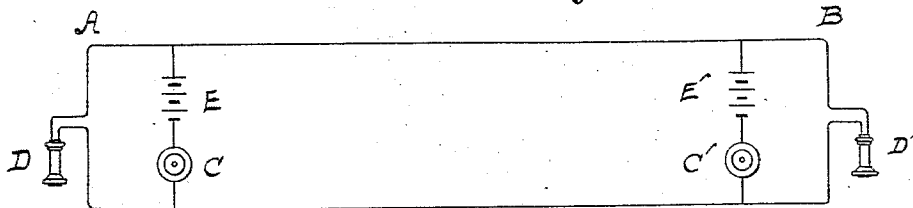
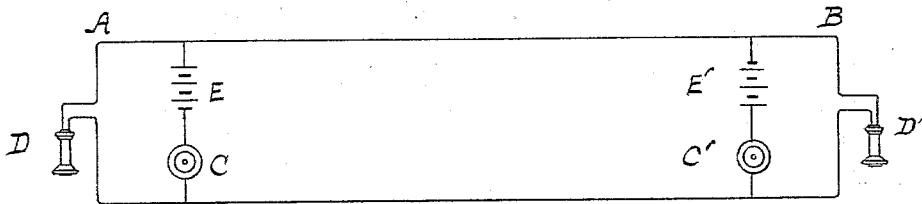


Fig. 4.



Inventor

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Witnesses

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UNITED STATES PATENT OFFICE.

FRANK R. COLVIN, OF NEW YORK, N. Y., ASSIGNOR TO THE INTERIOR
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TELEPHONY.

SPECIFICATION forming part of Letters Patent No. 552,865, dated January 7, 1896.

Application filed January 14, 1895. Serial No. 534,843. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. COLVIN, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Telephony, of which the following is a specification.

The object of this invention is to improve telephone transmission in systems employing battery-transmitters and to avoid failures in transmission due to errors in connecting two circuits in such a system and opposing the electromotive forces of the batteries.

I carry out my invention by placing the receiving-telephone and the battery-transmitter in parallel branches of the circuit. The entire energy of the battery thus passes through the transmitter and a much greater fluctuation of current-strength is developed during transmission than in organizations where the battery is inserted in the line.

The several features of novelty will be more particularly hereinafter described, and will be specifically indicated in the claims appended to this specification.

In the accompanying drawings, which illustrate my improvements, Figure 1 is a diagram of a circuit employing direct-current transmitters in which all instruments are in simple series relation, which is the organization commonly adopted. Fig. 2 is a diagram of a system having the transmitters and receivers in parallel and the battery in the line, and Figs. 3 and 4 illustrate organizations embodying my invention.

In the drawings, A and B represent two stations of a telephone system, and C D C' D' the transmitting and receiving apparatus.

The type of transmitter I prefer to employ is that described in patents issued to me No. 513,305, dated January 23, 1894, and No. 524,524, dated August 14, 1894, wherein is used a body of granular carbon of high resistance.

It is evident that with an organization such as depicted in Fig. 1, where all instruments are in series, the receivers would add together in inductance to cut down the effectiveness of telephone transmission, and what is of still greater practical effect the resistances of the transmitters would add together to cut down

the ampère value of the current, and thereby reduce the degree of fluctuation of the talking-currents. The strength of the battery-currents could in a measure be increased by placing the transmitters and receivers in parallel branches of the circuit, the battery still remaining in line, as shown in Fig. 2. In such an organization, however, by reason of the high resistance of the transmitters, the main body of the current would follow the receiver branch and the strength of current in the transmitter branch would be low, thereby lowering the degree of current fluctuation under the voice-waves.

The best results are attained when the battery and the transmitter are both in the same branch and the receiver and transmitter branches are in parallel, as shown in Figs. 3 and 4. In such an organization it will be seen that the entire strength of the battery is exerted in the transmitter branch, the home and distant receiver receiving current in parallel, and therefore combining to lower the resistance of the circuit. The high resistance of the transmitter at the receiving end of line diverts most of the current through the receiver branch. For example, suppose the transmitters have each a resistance of six hundred ohms and the receivers a resistance of seventy-five ohms. The strength of incoming current in the receiving branch at the distant station would be about eight times as great as in the transmitter branch.

It will be noted upon examination that the transmitting-batteries in Fig. 3 have similar poles to line, whereas those in Fig. 4 have opposite poles to line. I find that the transmission is substantially of the same intensity in the two organizations, a feature of considerable importance in practice where a number of circuits are to be interconnected through the instrumentality of a central station, since it makes no practical difference how the two stations desiring communication have their circuits connected. Moreover, in installing or repairing a system no testing is required to determine the polarities of the wires, and therefore a great saving of time and expense is effected.

It will of course be understood that more than two stations may be used on the same

line, the instruments always being placed in parallel relation with the battery interposed in the transmitter branch.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a telephone circuit, the combination with two limbs or lines extending between two telephone sets, of two branches or bridges, each containing a battery and a microphone or battery transmitter, and two parallel branches each containing a receiver, whereby the battery current through each transmitter finds path over the two receiver branches in parallel to thus decrease the resistance of the battery circuit through the microphone, while incoming currents traverse the receiver instead of the branch containing the transmitter; substantially as described.

2. In a telephone circuit, the combination

with two lines or limbs extending between two sub-stations, of two branches or bridges at one of said sub-stations, one containing a battery and a microphone or battery transmitter, and the other containing a receiver, and a receiver at the other of said sub-stations, whereby the battery current through the microphone finds path through the two receivers in parallel to thus decrease the resistance of the battery circuit, while incoming currents to the first sub-station traverse the receiver instead of the transmitter; substantially as described.

In testimony whereof I have hereunto subscribed my name this 9th day of January, A. D. 1895.

FRANK R. COLVIN.

Witnesses:

ROBT. H. READ,

GEO. M. PHELPS.