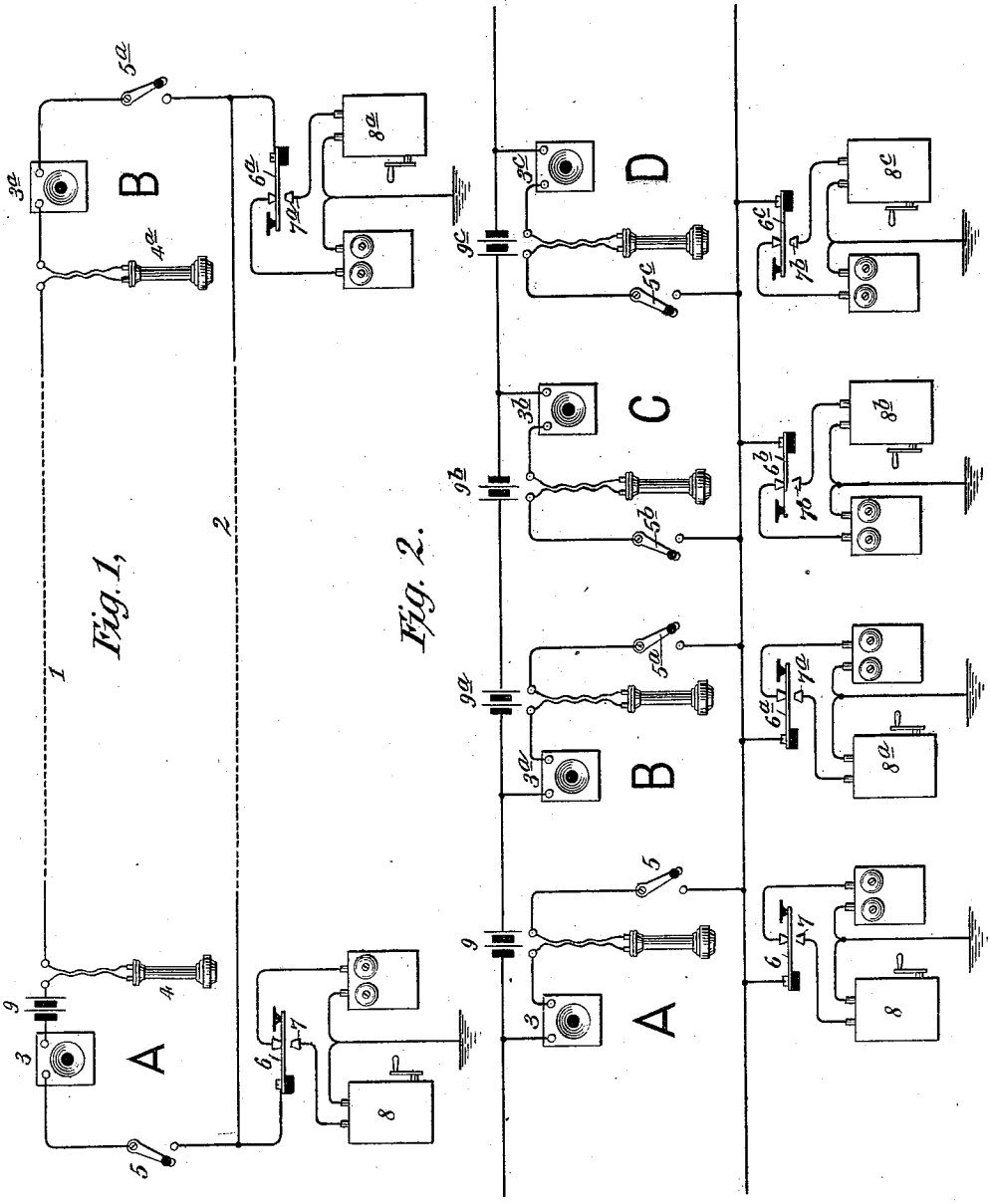
(No Model.)

F. R. COLVIN.

TELEPHONY.

No. 554,656. Patented Feb. 18, 1896.



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FRANK R. COLVIN, OF NEW YORK, N. Y., ASSIGNOR TO THE INTERIOR TELEPHONE COMPANY, OF SAME PLACE.

TELEPHONY.

SPECIFICATION forming part of Letters Patent No. 554,656, dated February 18, 1896.

Application filed November 24, 1894. Serial No. 529,788. (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.

This invention relates to telephony. Its object is to provide a system of intercommunication for a plurality of subscribers, by which the advantages of a round metallic circuit with a minimum amount of self-induction may be afforded any desired number of subscribers, and yet each subscriber may be able to call up any other with a calling apparatus of adequate power.

In carrying out my invention I provide two line-wires extending throughout the district occupied by the several subscribers and connect the talking-instruments of the several subscribers in multiple-arc relation to this pair of line-wires, thus affording a round metallic circuit over which conversation may be held. I utilize one of the line-wires as a signaling-wire, providing at the several subscribers' stations normally-grounded branches, including signaling-instruments. Thus any subscriber of the system may call up any other subscriber over the calling-wire, the calling impulses passing over the circuit independent of the talking-instruments, and when conversation is being held the advantage of a round metallic circuit unaffected by the self-induction of the calling-instruments is afforded. The system is preferably operated with a battery-transmitter, and a battery is interposed in one line-wire at each station, so that the electromotive force of the talking-current increases with the distance between conversing subscribers. The multiple-arc branches of the talking-circuit in which the talking-instruments are interposed are provided each with a switch, so that they are normally open, thus confining the voice-currents to the instruments connected for the time being in circuit.

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

In the accompanying drawings, which illustrate the invention, Figure 1 is a diagram of a circuit containing two subscribers, embodying the features of my invention; and Fig. 2 is a diagram of a circuit embodying four subscribers.

Referring first to Fig. 1, A and B represent two stations connected by conductors 1 2, between which are interposed at each station a transmitter 3 and a telephone-receiver 4. A switch 5 5^a is preferably provided at each station, though in a system embodying two subscribers only the circuit 1 and 2, including the telephone-instruments, might be maintained continuously closed. By providing a switch as indicated there is no waste of battery power when the subscribers' instruments are not in use. I preferably employ a battery-transmitter of a type described in a patent issued to me, No. 513,305, dated January 23, 1894, so that so long as the switches are closed current is flowing throughout the circuit 1 2, including the transmitter and receiver of the two subscribers.

At each subscriber's station is provided a permanent ground or connection with a third wire to act as a return, including calling-instruments. I prefer to use a polarized bell of high resistance normally preserved in connection with the ground or return by means of a key 6. The key co-operates with a normally-disconnected contact 7 connected with one pole of a magneto-generator 8, the other pole of which is connected to ground. It will thus be seen that the calling-circuit is a separate circuit, including one side of the metallic talking-circuit, and a subscriber may call another without interrupting the conversation being conducted by another pair of subscribers. Moreover, two pairs of subscribers in different parts of the system may carry on conversation at the same time. It will be seen, moreover, that the talking-currents do not traverse the calling-instruments, and in consequence thereof only the self-induction of the telephone-receivers and wire-conductors is encountered.

In Fig. 2 I have shown a diagram accommodating a larger number of subscribers. The principles involved are, however, the same, the talking-instruments of the several stations being placed in multiple-arc branches

between the line-wires, each branch being normally maintained open at a switch 5 5ª, &c., whereas the calling-outfit is connected between one side of the circuit at the several stations and the ground or a separate return-wire. In some portion of the line between each pair of subscribers is interposed a battery 9 9ª, &c., the electromotive force of which is graduated in accordance with the distance between the stations. The battery is preferably located at the subscriber's instrument.

From the organization thus far described it will be seen that if subscriber A is conversing with subscriber B his line will be charged with less battery than when conversing with subscriber C, as should be the case to maintain a uniform standard of strength for the talking-currents, and that whatever be the distance between two communicating subscribers the strength of the talking-currents will be uniform. It will also be seen that any subscriber may call up any other subscriber over a grounded circuit without interfering with any conversation that may be passing on the talking-circuit.

The calling-instruments are preferably wound with high-resistance coils, so that but little leakage of the telephone-currents will occur by way of the two grounds afforded at the stations of conversing subscribers.

The calling-instruments may be of any approved pattern. I preferably employ a polarized bell, as indicated, normally preserving a ground at the several stations through a spring-actuated circuit-closer or key. In calling up another subscriber the key may be depressed and the ground thrown at the calling-station from the bell to a magneto-generator, wound to impose upon line-currents of sufficient potential to actuate the polarized receiving-instruments at any station. It will also be seen that although but two wires are employed any desired number of subscribers may be connected and provided with independent calling and talking circuits.

Obviously, in lieu of the ground return for the calling-circuit, a third wire might be employed without departure from the scope of my invention.

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

1. In a party-telephone line, the combination with a plurality of sub-stations, of a metallic circuit, the two limbs of which extend through all of said sub-stations, a normally-open bridge at each of said sub-stations, a microphone or battery-transmitter directly included in each of said bridges, a battery connected in circuit at each sub-station, means at each sub-station for closing the bridge, whereby two telephone-sets may be looped into circuit for conversation, a signal-transmitting instrument at each sub-station located in a branch extending from one of the metallic limbs to ground, and a signal-receiving instrument at each sub-station located in a branch extending from said metallic limb to ground; substantially as described.

2. In a party-telephone line, the combination with a plurality of sub-stations, of two metallic limbs extending through all of said sub-stations, a normally-open bridge at each sub-station, a microphone or battery-transmitter included in each of said bridges, means at each of said sub-stations for closing the bridge whereby two telephone sets may be looped into circuit for conversation, a signal-transmitting instrument at each sub-station included in a branch conductor extending between one of said metallic limbs and ground, a signal-receiving instrument at each of said sub-stations likewise included in a branch conductor extending from said metallic limb to ground, and a battery at each sub-station located in one of said metallic limbs, whereby, when two sub-stations are looped together for conversation, a number of batteries will be connected in the talking-circuit in series, the number depending upon the distance between the sub-stations; substantially as described.

In testimony whereof I have hereunto subscribed my name this 22d day of November, A. D. 1894.

FRANK R. COLVIN.

Witnesses:
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