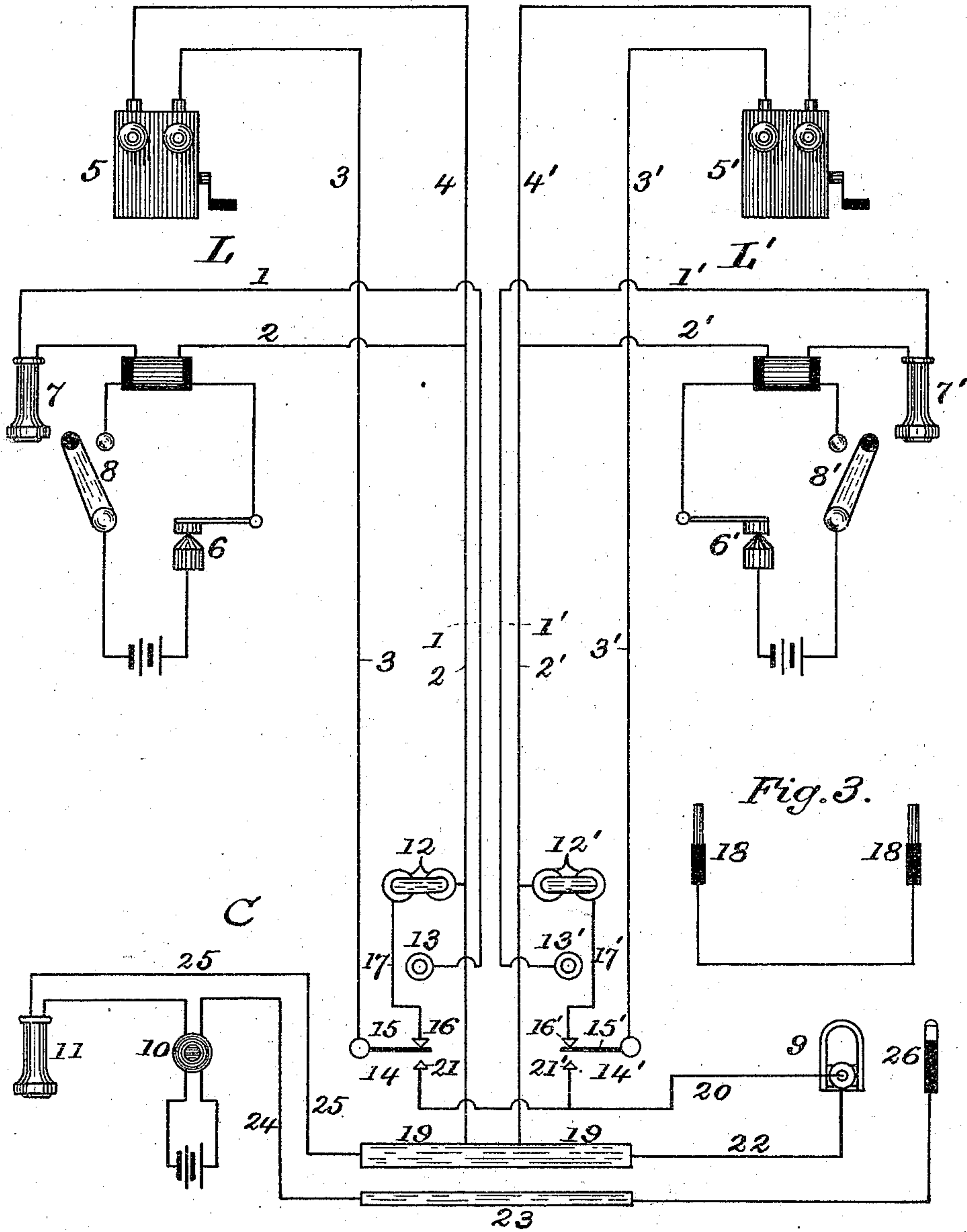


E. E. YAXLEY & J. H. RILEY.
TELEPHONE EXCHANGE SYSTEM.

No. 547,388.

Patented Oct. 1, 1895.

Fig. 1.



Witnesses.

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Geo. H. Arthur

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By their Attorney

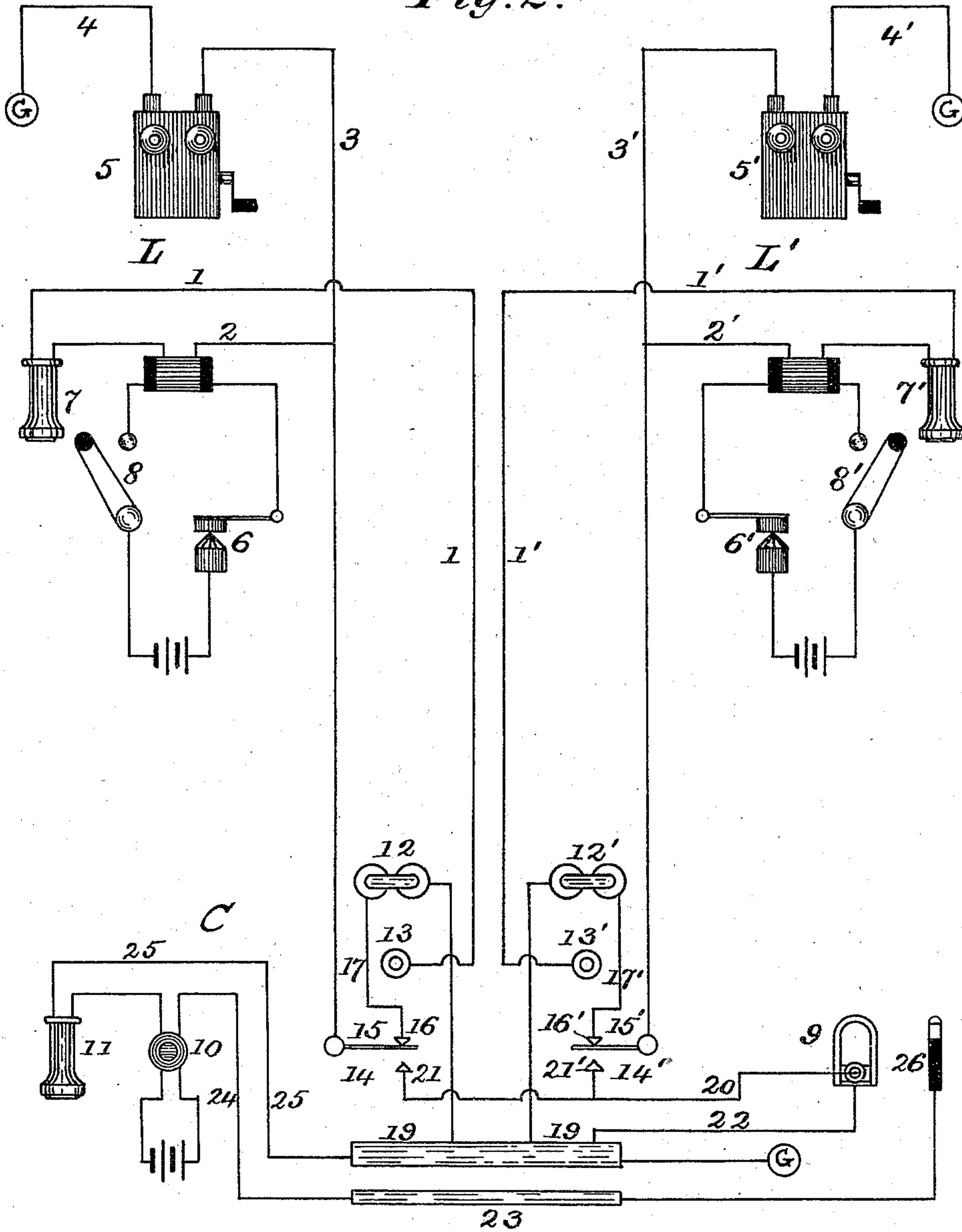
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Fig. 2.



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UNITED STATES PATENT OFFICE.

ERNEST E. YAXLEY AND JOHN H. RILEY, OF CHICAGO, ILLINOIS, ASSIGNORS
OF ONE-HALF TO LE ROY BROWN, OF SAME PLACE.

TELEPHONE-EXCHANGE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 547,388, dated October 1, 1895.

Application filed January 14, 1895, Serial No. 534,860. (No model.)

To all whom it may concern:

Be it known that we, ERNEST E. YAXLEY and JOHN H. RILEY, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephone-Exchange Systems; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to a system of circuits for telephone communication in connection with a central exchange or station; and the objects of the present improvement are to provide a simple and efficient system of telephone-circuits, either metallic or ground, in which the telephone or "talking" circuit and the signal or "calling" circuit are arranged as substantially independent circuits, but preferably with a common return, and in which improved construction a direct and metallic talking-circuit of a minimum resistance is provided, and which arrangement has a further advantage in that it avoids in a very simple and efficient manner the usual feature of a shunt circuit around the generator of the subscriber's call or signal, in that in the present system a generator of the required power in the central station is adapted to ring such subscriber's signal through the armature winding of such subscriber's call-generator.

Other features of merit in the present system are as follows: The subscriber's telephone-switch, either opened or closed, does not affect the sending of a call or signal. Again, the subscribers' signals or calls do not signal or call each other, but are rung from the central station by a generator at that point; and, again, in sending a signal from the central station, the annunciator-coil, being out of circuit, will not be actuated to give an annunciation. By this means the labor of resetting the annunciator-drop after such signal is saved. The above objects are attained by a construction and arrangement of parts substantially as shown in the accompanying drawings, in which—

Figure 1 is a diagrammatic view illustrating a pair of subscribers' stations and the connections thereof with the central station or

exchange. Fig. 2 is a similar view illustrating a modified arrangement from that shown in Fig. 1; Fig. 3, a detail view of the flexibly-connected plugs used in the central station.

Similar letters and numerals indicate like parts in the several views.

In the accompanying drawings I have illustrated a pair of subscribers' or local telephone-stations connected by the individual wires or circuits to the central or operative's station. Any desired number of such local or subscribers' stations may be arranged in a similar manner, as the requirements may indicate.

Referring to the drawings, C represents the central station, and L and L' a series of two subscribers' or local stations connected to the central station by their individual wires 1 1', 2 2', and 3 3', 4 4'. Each subscriber's or local station will be provided with the usual signal or call 5 or 5', a transmitter 6 or 6', a receiver 7 or 7', and a switch 8 or 8', controlling the local battery, and which may be either manual or automatic in its operation. The central station C will be provided with a generator 9, a transmitter 10, a receiver 11, and a companion series of annunciators 12 12', sockets or bushings 13 13', and push buttons or switches 14 14', equal in number and connected in an individual manner with the subscribers' stations L L', as hereinafter set forth.

In the present improvement each individual signal or call circuit of a local station L or L', in so far as it relates to sending a signal from a subscriber's or local station to the central station, will be formed by the wires 3 4 or 3' 4', as the case may be, and such circuit will embrace the local signal or call 5 or 5', the annunciator 12 or 12', the switch 14 or 14'. Current starting from a pole of the generator of the local signal or call 5 or 5' passes through wire 3 or 3' to the switch-lever 15 or 15' to upper contact-point 16 or 16', and through wire 17 or 17' to the annunciator 12 or 12' to give a visible signal in the central station, and from thence back through the wire 4 or 4' to the opposite pole of the generator of the local signal or call 5 or 5'. In like manner the individual telephone or talking circuit of a local station L or L', in so far as it relates to talking between two local sta-

tions, will be formed by the wires 1 2 or 1' 2', extending to their respective sockets or bushings 13 13' at the central station. Now with these two bushings 13 13' electrically coupled by the flexibly-connected plugs 18, starting, for example, from one pole of the secondary circuit of the induction-coil of the transmitter 6, the current passes through the receiver 7 and line-wire 1 to the bushing 13 and through the flexible conductor-coupling 18 to the bushing 13', and from thence through the line-wire 1' to the receiver 7', the current returning from thence through the induction-coil of the receiver 7' over line 2' to the general connecting-strip 19 in the central station C, and from thence through, over line-wire 2, completing the circuit.

In the present improvement the central station or operator's signal-circuit to each subscriber's station will comprise the central generator 9, connected by line 20 with the lower contact-points 21 21' of the switch 14 14' before described, such central generator having a return-connection 22 to the general connecting-strip 19. With the switch-lever 15 in contact with the lower contact-point 21 or 21', the individual annunciator-coil 12 or 12' will be cut out of circuit, and the current passes through line-wire 3 or 3' to the subscriber's call or signal 5 or 5' to sound an alarm, and returns through the line-wire 4 or 4' down to the general connecting-strip 19, to which said lines 4 or 4' are connected by a branch wire extending from the point of connection thereof to annunciators 12 12' down to such general connecting-strip, the current returning thence to the central generator 9 through return-connection 22. The central station or operative's telephone or talking circuit to each subscriber's station will comprise a secondary central station, connecting-strip 23, that is connected by wires 24 25 with the operator's transmitter 10, receiver 11, and the general connecting-strip 19, the opposite end of the secondary connecting-strip 23 being provided with a flexibly-connected contact-point 26, for a purpose hereinafter set forth.

In connecting up the central station with any particular subscriber's station, the individual bushing 13 or 13' thereof is connected to the secondary connecting-strip 23, either by the ordinary flexibly-connected contact-point 18 or by the flexibly-connected contact-point 26. With this connection the central-station talking-circuit formed by the wires 24 and 25 is in communication with the subscriber's talking-circuit, heretofore described, and where two subscribers' talking-circuits are connected together the central-station talking-circuit will be connected thereto in multiple, so that the central station operative can communicate with either of such subscribers. For example, in talking from the central station to subscribers' station L, the current passing from the central transmitter over the line 24, secondary connecting-strip 23, flexibly-connected coupling 18 or 26, bushing 13', line 1,

and subscribers' receiver 7; returning through the induction-coil of the transmitter 6, line 2, general connecting-strip 19, line 25, and receiver 11, back to the transmitter 10.

In ordinary use the flexibly-connected contact-points 18 will be the most convenient and ready means for making connections between any of the individual bushings 13 13' and the secondary connecting-strip 23, and it is only when such flexibly-connected contact-points are in use as a connecting-coupling between a pair of such bushings that the flexibly-connected contact-point 26 need be used to cut in the central-station talking-circuit.

In the modified arrangement of the present system, as illustrated in Fig. 2, the main and essential difference from that shown in Fig. 1 consists in employing a "ground" or common return for lines 4 and 4', the general connecting-strip 19 being also "grounded" or connected to the common return-wire.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a telephone exchange system, the combination of the series of separate and entirely independent talking and call circuits for the subscribers' stations, separate and independent talking and call circuits in the central station, a series of annunciators, switches, and bushings in the central station, that have connection with the subscribers' circuits, a general connecting strip, at the central station, having connection with the central station circuits, and with the returns of the subscribers' circuits, and a connection extending from the central station, talking circuit, and adapted to make connection with any of the series of subscribers' bushings, the talking and call circuits of the subscribers' stations, being capable of simultaneous and independent use, substantially as set forth.

2. In a telephone exchange system, the combination of the series of separate and entirely independent talking and call circuits for the subscribers' stations, separate and independent talking and call circuits in the central station, a series of annunciators, switches, and bushings in the central station, that have connection with the subscribers' circuits, a general connecting strip, at the central station, having connection with the central station circuits, and with the returns of the subscribers' circuits, a secondary connecting strip connected to the central station, talking circuit, and means for connecting the same, with any of the series of subscribers' bushings, the talking and call circuits of the subscribers' stations, being capable of simultaneous and independent use, substantially as set forth.

3. In a telephone exchange system, the combination of the series of separate and entirely independent talking and call circuits for the subscribers' stations, separate and independent talking and call circuits in the central station, a series of annunciators, switches and

bushings, in the central station, that have connection with the subscribers' circuits, a general connecting strip at the central station, having connection with the central station circuit, and with the returns of the subscribers' circuits, a secondary connecting strip connected to the central station talking circuit, and means for connecting the same, with any of the series of subscribers' bushings, such means consisting of a flexibly connected contact point 26, the talking and call circuits of

the subscribers' stations, being capable of simultaneous and independent use, substantially as set forth.

In testimony whereof witness our hands 15
this 11th day of January, 1895.

ERNEST E. YAXLEY.
JOHN H. RILEY.

In presence of—

ROBERT BURNS,
GEO. H. ARTHUR.