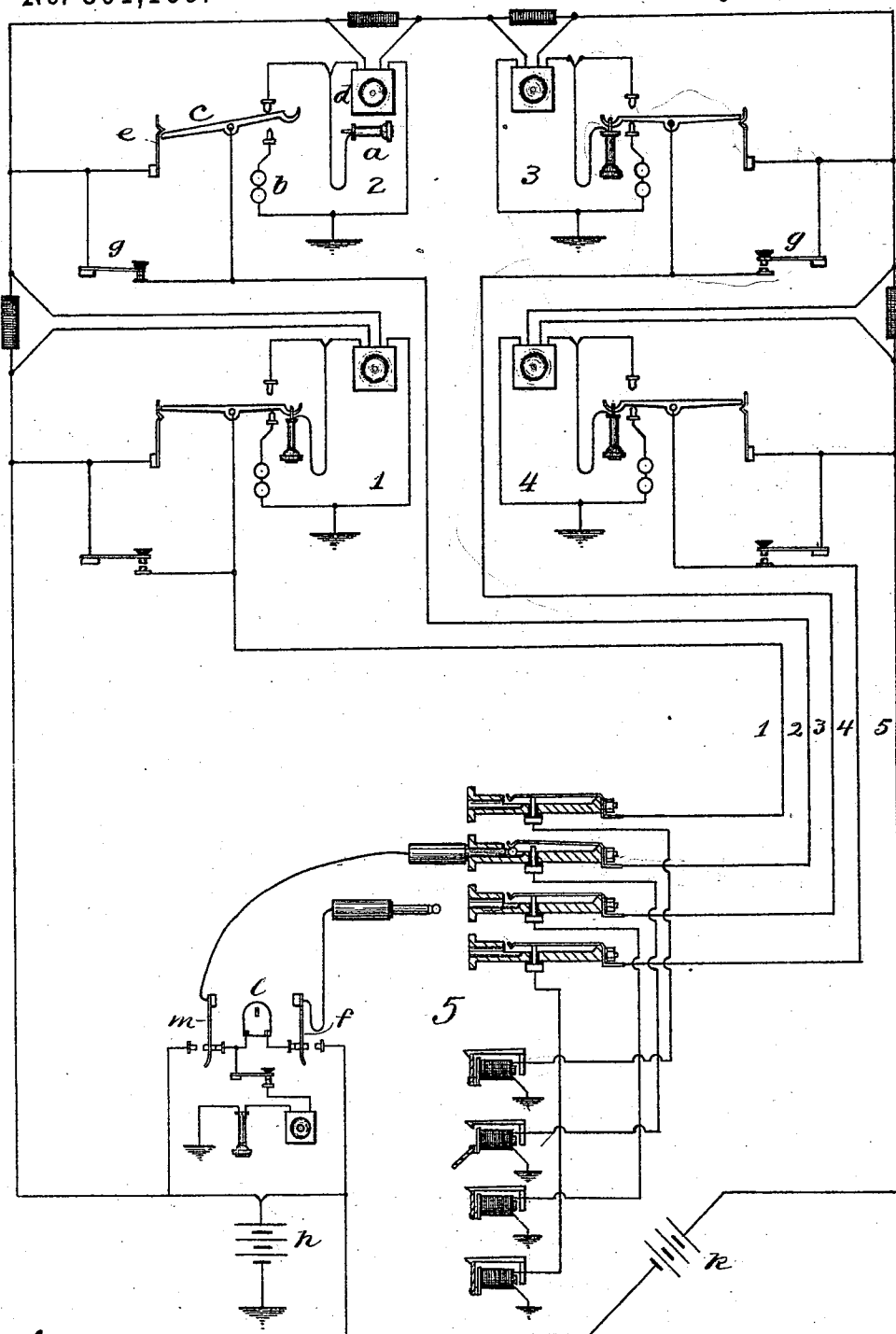


(No Model.)

C. E. SCRIBNER.
TELEPHONE EXCHANGE APPARATUS.

No. 501,169.

Patented July 11, 1893.



Witnesses:

Chas. G. Hawley.

Chas. C. Woodworth

Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN
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TELEPHONE-EXCHANGE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 501,169, dated July 11, 1893.

Application filed June 6, 1888. Serial No. 276,209. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen 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 Apparatus, (Case No. 58,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to telephone exchange apparatus and circuits, and its objects are, first, to provide a means of signaling from each subscriber's station to the central office and from the central office to each of the stations by the employment of a single source of current; and, second, to provide an arrangement of circuits, whereby a single battery at one point is made to supply different subscribers' transmitters over the same wire with which the signaling battery or generator is connected. The battery which furnishes current to several subscribers' stations is connected into a metallic circuit while another battery which is used for signaling the different subscribers is connected in a ground branch with the same metallic circuit. The transmitter of any subscriber, who is talking, is connected into this metallic circuit and any subscriber, by simply taking down his telephone, automatically closes the signaling battery through his annunciator at the central office. I provide in addition to the telephone switch, a key by which the subscriber may repeat the signal. The operator at the central office, by means of suitable switching apparatus, may send current from the same signal battery over any individual telephone line.

In the drawing are shown four subscribers' stations, 1, 2, 3, 4, and the central office 5. At the central office is shown ordinary switchboard apparatus with annunciators, spring-jacks and means for connecting the different subscribers' wires together. Individual telephone lines, 1, 2, 3, 4, are shown connecting their respective subscribers' stations with the central office. The circuit wire 5 connects from the central office to all of the subscribers' stations in a complete metallic circuit, as shown.

Each of the subscribers' stations is provided with an outfit consisting of the telephone *a*, bell *b*, switch *c* and transmitter *d*. The circuit of the outfit may be traced as follows: First, when the telephone is on the hook, the main line connects with the lever *c*, thence through one of the contact points to bell *b*, thence to ground; second, when the telephone is removed from the hook, the line is switched to the other contact point and thence through the receiver and transmitter coil to ground. Near the end of the switch lever is provided a spring contact *e* to which a connection is made by the switch lever during a portion of the time it is moving from one position to the other. This connection is but momentary and is always broken before the lever is arrested by coming into contact with either of its stops. The spring contact *e* is permanently connected at each station to the circuit wire 5. At the central station, a battery *h* is shown with one pole grounded and the other pole connected to the circuit wire 5.

The circuit of the calling battery *h* at the moment contact is made between the lever *c* and spring *e* at any station—for example, station 2—may be traced as follows: by the two branches of the metallic circuit 5 to the spring *e* and thence to lever *c* and thence by line 2 to the switchboard thence through the annunciator to ground.

The drawing shows the telephone removed at station 2 with the shutter of said station down. A plug is shown inserted at the spring-jack for the purpose of answering the call indicated by the fallen shutter.

The operator upon learning who is wanted inserts the other plug of the pair into the springjack of the desired subscriber and signals him by depressing the key *f* connected to the said plug. Suppose the desired subscriber to be number 3, and the plug inserted in his springjack; now upon the depression of the key *f* the circuit of the battery *h* may be traced to the wire 5, thence to said key *f* and thence by the plug, springjack and wire 3 to station 3, and thence through the bell to ground, thus effecting the desired signal. It will thus be seen that by the use of my improvement a common battery may be

used to signal from the central office to the subscribers' stations and from the different stations to the central office.

Introduced into the metallic circuit 5 is shown a battery *k*, the function of said battery being to supply the different subscribers' transmitters with current. This may be done in any well-known way. I am thus enabled to use the circuit into which is introduced this transmitter battery and the transmitters at the various stations, to convey current from the signaling battery *h* to the various stations. The metallic circuit may thus be used for two purposes in connection with the two batteries, one purpose being for signaling and the other purpose for supplying the transmitters with battery.

At each of the stations in addition to the spring contact *e*, I place a key *g* the depression of which serves to connect the line to the signaling circuit 5, and thus I provide an independent means for the subscriber to signal the central office, when, for any reason, the first automatic signal is not answered.

In the cord between the two connecting plugs is provided a clearing-out annunciator *l* through which the circuit of the signaling battery *h* is completed when either of the connected subscribers replaces his telephone on the hook. The circuit thus formed may be traced from the battery *h* to the circuit wire 5 to the spring *e* and lever *c*, as before described, thence by line 2, springjack, plug, cord, key *m* and annunciator *l* and thence through the plug to the other subscriber's line and to ground. Thus at each motion of the switch lever at the subscriber's station the circuit of the battery *h* is completed through the subscriber's line to the central station and to ground either through the subscriber's individual annunciator—whereby a call is made—or in case they are already connected through the clearing-out annunciator *l*.

The transmitter and induction coil circuit as shown in this application, is described and claimed in an application, Serial No. 85,073, filed February 14, 1883, upon which Letters Patent No. 330,056 were granted November 10, 1885, for battery circuit for telephone exchanges.

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

1. The combination with the metallic cir-

cuit including several subscribers' stations 55 and a central station, of the transmitters at said stations connected therewith, two batteries, one battery being included in the metallic circuit for furnishing current to the transmitters and the primary coils of the induction coils of the transmitters connected therewith, and the battery being included in a wire branched from said metallic circuit to ground, the individual telephone lines of said stations, and switching apparatus; whereby 60 signals may be sent over the metallic circuit, while, at the same time, the transmitters are supplied with battery, substantially as described.

2. The combination in a telephone exchange 70 system of a metallic circuit extending to the different subscribers' stations, a battery included in the circuit of said metallic circuit, a ground branch from said metallic circuit at the central station including battery and individual telephone lines one to each subscriber's station, said individual telephone lines each including a signal device at the central station, a transmitter and the primary coil of the induction coil thereof connected at each 80 subscriber's station with the metallic circuit and supplied with current from the battery included in said metallic circuit, and switching devices one at each subscriber's station for branching the individual lines to the said 85 metallic circuit, whereby transmitters may be supplied with battery and the signal devices operated, substantially as described.

3. In a telephone exchange the combination 90 with telephone lines each connected through a switch and annunciator to ground at the central office and at their outer ends with a subscriber's telephone outfit respectively, of a metallic circuit, a branch circuit to ground containing battery *h*, and switching apparatus at the central office; whereby any subscriber may send current from said battery 95 through his annunciator at the central office while the operator may send current from said battery through the bell of any subscriber wanted, substantially as and for the purpose specified. 100

In witness whereof I hereunto subscribe my name this 23d day of May, A. D. 1888.

CHARLES E. SCRIBNER.

Witnesses:

CHAS. C. WOODWORTH,
GEORGE P. BARTON.