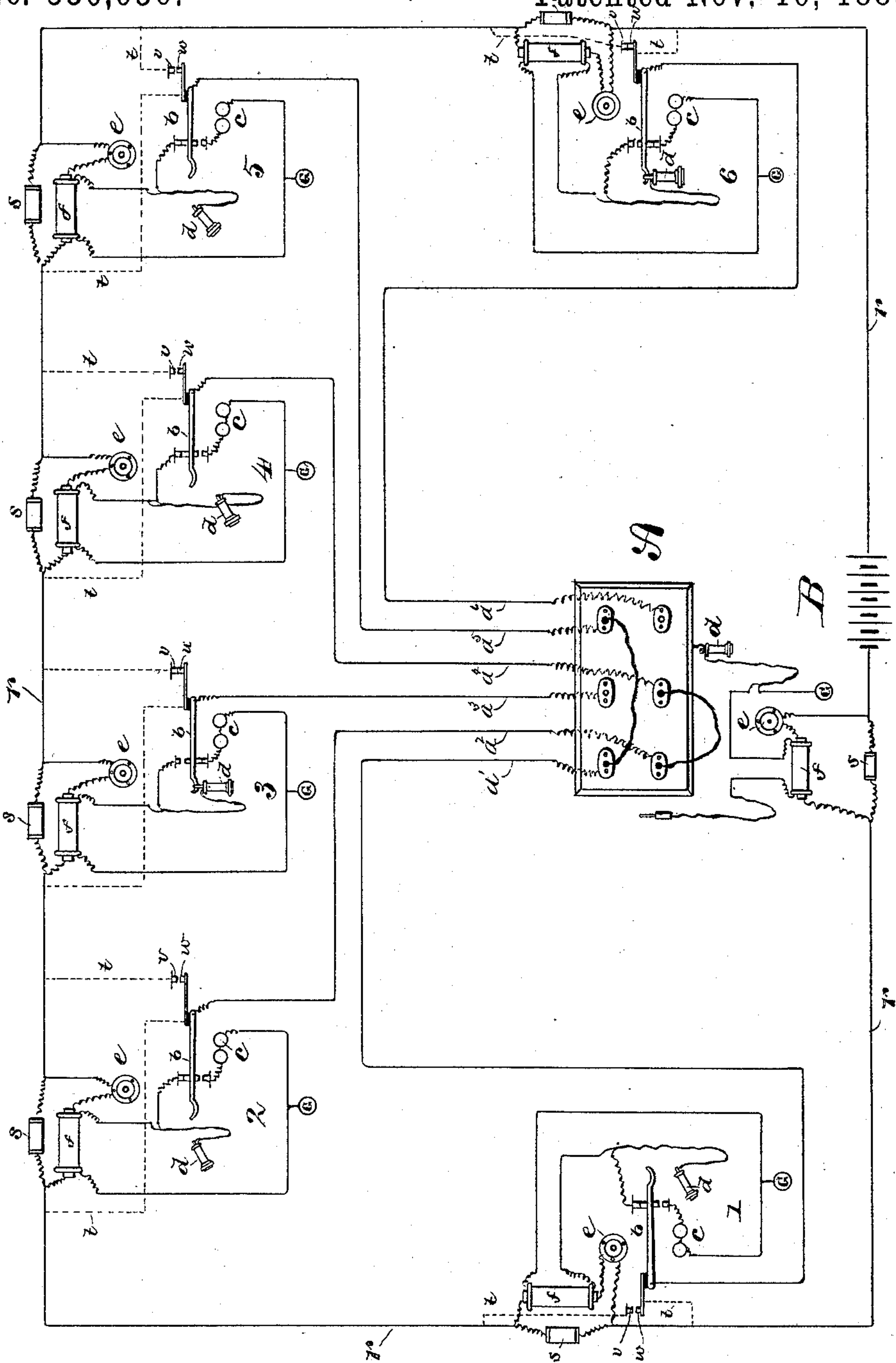


(No Model.)

C. E. SCRIBNER.  
BATTERY CIRCUIT FOR TELEPHONE EXCHANGES.

No. 330,056.

Patented Nov. 10, 1885.



Attest  
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# UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

## BATTERY-CIRCUIT FOR TELEPHONE-EXCHANGES.

SPECIFICATION forming part of Letters Patent No. 330,056, dated November 10, 1885.

Application filed February 14, 1883. Serial No. 85,073. (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 Battery-Circuits for Telephone-Exchanges, 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 circuits and means whereby a central battery may be utilized for charging the induction-coils and furnishing current for the operation of the transmitters of many subscribers of a telephone-exchange. Heretofore this has been accomplished as set forth in my Letters Patent No. 243,165, dated June 21, 1881, by means of a Wheatstone bridge placed in circuit at each subscriber's station for the purpose of localizing the voice-current vibrations produced by the transmitter.

By my invention herein set forth I have sought to simplify the circuits and means heretofore employed for this purpose; and my invention consists in the circuits and combinations hereinafter described and claimed.

In the accompanying drawing, which is a diagram illustrative of my invention, I have shown six subscribers' stations, connected by their individual wires to a central office in the ordinary manner, said stations all being located on a single battery-circuit having its source of supply at the central office.

Referring to the said drawing, A represents the central station; 1, 2, 3, 4, 5, and 6, the different subscribers' stations connected to the central station, A, by their individual wires  $a'$ ,  $a^2$ ,  $a^3$ ,  $a^4$ ,  $a^5$ , and  $a^6$ . The central office and each subscriber's station may be provided with any ordinary telephone-outfit in which a battery is used in circuit with the transmitter and an induction-coil.

The telephone-outfit which I have shown at each subscriber's station is one of the most common forms now in use, consisting of a switch-lever,  $b$ , signal device  $c$ , receiver  $d$ , transmitter  $e$ , and induction-coil  $f$ , the switch-lever  $b$  being adapted to cut out the signal device and cut in the transmitter and receiver by removing the telephone from the hook.

Stations 1 and 5 and 2 and 4 I have shown connected at the central office for conversation-stations, 3 and 6 being shown in normal condition. A subscriber's circuit in the normal condition may be traced from the central office, A, by its individual wire to switch-lever  $b$ , thence through signal device  $c$  to ground, as shown at stations 3 and 6. When the telephone is removed from the hook, the circuit will be from switch-lever  $b$  through receiver  $d$ , and the secondary of the induction-coil  $f$  to ground. From a battery, B, placed preferably at the central office, I run a circuit,  $rrrr$ , which passes through the transmitter  $e$  and the primary of the induction-coil  $f$  of each telephone-outfit. Around each transmitter  $e$  and induction-coil  $f$  in this circuit I provide a shunt containing a resistance-coil,  $s$ , of preferably about one-half the combined resistance of the transmitter and induction-coil. I also provide at each station a short circuit or shunt,  $tt$ , of no appreciable resistance, containing contact-points  $vw$ , adapted to open or close said short circuit or shunt by the movement of the switch-lever  $b$ . This short circuit or shunt  $tt$ , when closed at the contact-points  $vw$ , forms a path for the battery-current entirely around the transmitter, induction-coil, and resistance-coil, whereby their resistance is avoided when not in use. When the telephone is removed from the hook for use, the contact-points  $vw$  are separated, and the battery-current finds circuit through the transmitter and induction-coil, as is desired. Speech directed in the transmitter  $e$  will cause a variation of the current passing through the primary of the induction-coil  $f$ , and a corresponding vibration will be induced in the secondary of said coil, which finds circuit through the receiver  $d$  and out to line.

If the transmitter and primary of the induction-coil were placed directly in the circuit of battery B, the voice-current vibration produced by the transmitter would traverse the entire line  $rrrr$ , and would thus become very much enfeebled, and if two or more subscribers were talking at the same time the vibrations would be conflicting; but, by reason of the shunt containing the resistance-coil  $s$ , which passes around the induction-coil  $f$ , and transmitter  $e$ , thus forming a derived circuit, a



portion of the battery-current is continually flowing by this route. Therefore an increase of resistance in the transmitter merely causes more current to flow through the resistance-coil s and less through the transmitter and induction-coil, a decrease in said resistance producing an opposite result. Thus the variations of the current flowing through the induction-coil and transmitter of a given subscriber are localized and the main-battery current not appreciably affected. By this system a much less battery is required, from thirty to forty cells being sufficient to supply several hundred subscribers. Frequent inspection of the apparatus at the subscribers' stations is also avoided.

For clearness in the drawing I have omitted the ordinary annunciator-connections at the central office and the customary generators at the subscribers' stations. These may be supplied in any well-known manner.

I claim as my invention—

1. At a subscriber's station, a transmitter, an induction-coil, and a resistance-coil, the primary of said induction-coil and the transmitter being included in a battery-circuit, the secondary of said coil in a telephone-line, and the resistance-coil in a shunt around said induction-coil and transmitter, in combination with a short circuit or shunt around said induction-coil, transmitter, and resistance-coil, said short circuit or shunt being adapted to be opened or closed by a switch-lever, substantially as specified.

2. The combination, at a subscriber's station, with a transmitter, and the primary of an induction-coil included in a battery-circuit, the secondary of said induction-coil being included

in a telephone-line, and a resistance-coil in a shunt around said induction-coil and transmitter in the battery-circuit, of a short circuit entirely around the said transmitter, induction-coil, and resistance, said short circuit being adapted to be opened or closed by the telephone-switch which opens or closes the local telephone-circuits, substantially as set forth.

3. In a telephone-exchange, the combination, with a battery in a circuit extending to several subscribers' stations, the transmitter and primary of the induction-coil at the different stations being included in said circuit, of a shunt-circuit at each of said stations around the transmitter and induction-coil and resistance-coils, one in each of said shunt-circuits, whereby circuit from said battery may be directed through the transmitters and their induction-coils, respectively, substantially as and for the purpose specified.

4. A transmitter and induction-coil at subscriber's station, said transmitter and the primary of said induction-coil being connected by circuit *r* with battery B at the central office, in combination with a telephone-line including the secondary of the induction-coil, and a shunt-circuit around said transmitter and primary of the induction-coil, and a resistance-coil included in said shunt, whereby current is directed from the main battery through the transmitter and primary of the induction-coil, as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 12th day of February A. D. 1883.

CHARLES E. SCRIBNER.

Witnesses:

PAUL A. STALEY,  
GEORGE P. BARTON.