

(No Model.)

C. E. SCRIBNER.
ANNUNCIATOR FOR TELEPHONE LINES.

No. 596,627.

Patented Jan. 4, 1898.

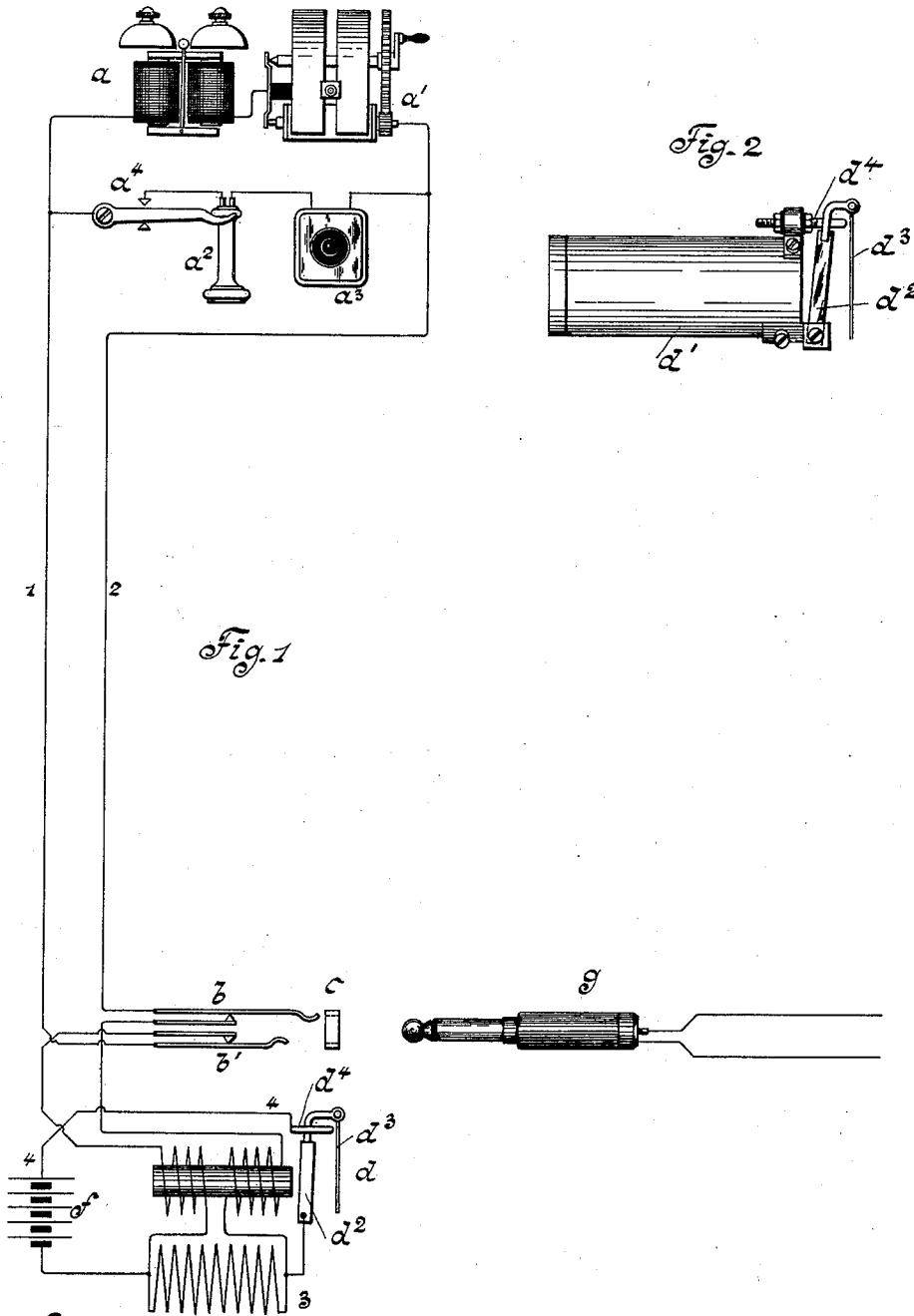
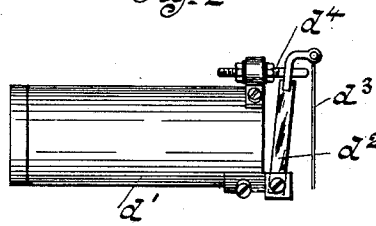


Fig. 2



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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN
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ANNUNCIATOR FOR TELEPHONE-LINES.

SPECIFICATION forming part of Letters Patent No. 596,627, dated January 4, 1898.

Application filed May 14, 1896. Serial No. 591,524. (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 Annunciators for Telephone-Lines, (Case No. 421,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention applies to telephone-lines equipped with line-annunciators and with means for making connection with the lines in a telephone-switchboard and with generators of signaling-current at the substations for causing the display of the line-annunciators.

The purpose of the invention is to provide means for causing the continued display of the annunciator after the transmission of a momentary signaling-current through it and for effacing the signal or concealing the indicator of the annunciator when connection is made with the line. To this end I have provided a signaling instrument or annunciator constructed to display its indicator when excited by current in its magnet-coil, an electromagnetically-actuated switch responsive to the calling-current, switch-contacts in the spring-jack or connection-socket of the line, which are separated when connection is made with the line, and a system of circuits uniting this apparatus such that the transmission of a momentary signaling-current from the substation causes the display of the indicator and at the same time closes a circuit of a local source of current through the annunciator to insure its continuous excitement, and that the insertion of a connecting-plug in the spring-jack to make connection with the line interrupts the current from the local source and permits the return of the annunciator and of the switch to their normal positions.

In practice I prefer that the electromagnetically-operated switch-contacts should be controlled by the armature of the annunciator itself, thus dispensing with unnecessary mechanism.

In a commercial form of the invention the electromagnet of the annunciator is provided

with an armature which when attracted operates a shutter or indicator and simultaneously closes a pair of switch-contacts. This annunciator is included in a bridge of the line-circuit, which may be interrupted at the switch-contacts of the usual spring-jack in the switchboard, together with a resistance-coil, which should preferably be interposed in the circuit between equal portions of the winding of the magnet, the magnet being divided into two equal helices for this purpose. In a conductor controlled by the switch-contacts of the annunciator and connected in shunt or parallel circuit with the resistance-coil is placed a local battery or other source of current.

In the normal condition of this apparatus the circuit of the local source of current is interrupted at the switch-contacts of the annunciator, while the line connection with the annunciator is closed in the spring-jack. When a momentary calling-current is transmitted in the line from the substation—as, for example, by means of the usual magneto-generator—the armature of the annunciator is attracted, displaying or actuating the indicator of the instrument and also closing the circuit of the local battery. After the cessation of the calling-current a current still flows through the annunciator to the line from the local source of current, which maintains the excitement of the annunciator and effects the continued display of its indicator. When, however, a plug is inserted into the spring-jack of the line in response to a call, this current from the local source is interrupted and the annunciator restored to its normal inert condition.

Thus by the use of well-known apparatus of very simple and inexpensive construction I am enabled to obtain substantially the same results as have heretofore been reached with the aid of complicated mechanism and involved circuits.

Of the accompanying drawings illustrative of the invention, Figure 1 is a diagram of the circuits which constitute the invention in combination with well-known apparatus of telephone-switchboards. The apparatus of a single substation is represented connected

through line-wires with a spring-jack and an annunciator in the switchboard. Fig. 2 is an elevation of a form of annunciator which I have found suitable for use in the system.

5 The apparatus at the substation may comprise a polarized signal-bell *a* and a generator of signaling-current *a'*, permanently connected in the line-circuit, a receiving-telephone *a*², transmitting-telephone *a*³, and a switch *a*⁴ for closing the line-circuit through these telephonic instruments when the telephone is brought into position for use. The line-wires 1 and 2 are connected in the switchboard with the switch-springs *b* and *b'* of a spring-jack *c*, from which they are normally extended, through the medium of the contact-anvils of the spring-jack, to the terminals of the line-annunciator *d*. The magnetizing-coil of this annunciator is constructed in two separate windings, whose inner terminals are connected together through a resistance-coil *e*.

The annunciator, as shown in Fig 2, has a tubular electromagnet *d'*, an armature *d*², pivoted at its lower edge, a shutter or shield *d*³, hung on brackets carried by the armature and normally concealing its face, and a fixed stud or pin *d*⁴, which impinges upon the shield below its pivotal point when the armature moves toward the magnet. The pivots or trunnions of the armature *d*² are carried in brackets fixed to the shell of the tubular magnet. The pin *d*⁴ is likewise carried by a bracket secured to the shell, but is insulated from the other parts of the apparatus by a bushing surrounding the pin.

While the magnet is inert the armature *d*² falls outward to a slight distance. The shield *d*³ depends in front of the armature and conceals it. When the magnet becomes excited and the armature is attracted to it, the shield *d*³ strikes the projecting extremity of the pin *d*⁴ and is thrust into a horizontal position, sliding or rolling over the curved extremity of the pin. As soon as the exciting-current in the magnet is interrupted the armature falls outward and permits the shield to return to its first position.

In the switchboard the frame or armature *d*² of the annunciator is connected by a wire 3 with one terminal of the resistance-coil *e*, while the pin *d*⁴ is connected by another conductor 4 with the other terminal of the same coil, a battery *f* or other generator of current being interposed in this wire.

The function of the resistance-coil *e* is to provide a circuit through which the signaling-current for operating the annunciator may be transmitted, while at the same time serving to divert current from the battery *f*, which is in parallel circuit with it, through the windings of the annunciator. When the circuit 3 4 is closed, the resistance-coil *e* produces a sufficient difference of potential between its terminals as respects the current from battery *f* to produce a flow of current through the windings of the annunciator.

In sending a call from the substation to the central station by means of this apparatus the subscriber operates his generator *a'* as usual, producing for a short time an alternating current in the line 1 2, which finds circuit through the spring-jack *c*, through the two windings of the annunciator *d*, and through the resistance-coil *e*. The magnet of the annunciator is excited by this current and attracts its armature, bringing the shield *d*³ into contact with the pin *d*⁴, thus throwing the shutter into position to disclose the face of the armature and at the same time to complete the connection of battery *f* with the line. When the circuit of the battery is thus closed, a current therefrom flows through wire 4 to wire 3, thence through one winding of the annunciator to line conductor 2, through the apparatus at the substation, returning by line conductor 1, traversing the other winding of the annunciator-magnet, and thence finding its return to battery *f*. This current continues to flow after the operation of the generator *a'* has ceased and holds the shutter of the armature in its raised position. In response to this signal the operator may insert the usual connecting-plug *g* into the spring-jack *c* of the line, whereby the connection of the annunciator with the line is broken. The breaking of this circuit interrupts the current from battery *f*, the magnet of the annunciator loses its magnetization, and the shutter falls into its normal position, concealing the face of the armature. The annunciator is thus automatically restored in the act of inserting a plug into the spring-jack.

Any of several well-known types of annunciator or visible signal may be used in place of the one herein described. Several minor variations in the circuit may also be made without departing from the mode of operation which constitutes the essence of my invention.

I claim as new and desire to secure by Letters Patent—

1. The combination with a closed signaling-circuit, of an annunciator having its winding together with a resistance-coil in the signaling-circuit, a source of current in a normally open shunt about the resistance-coil, switch-contacts in the annunciator actuated by the excitement thereof to close the said shunt and a switch adapted to break the circuit of the battery through the annunciator as described.

2. The combination with a telephone-line having at its substation means for producing in the line a momentary signaling-current, and at a central station an annunciator in the line-circuit and a spring-jack connected with the line, of switch-contacts controlled by an electromagnet responsive to such momentary signaling-currents, a local source of current, circuit connections controlled by the switch-contacts adapted to bring the local source of current into circuit with the annunciator, and other switch-contacts in the spring-jack

adapted to interrupt the circuit of said local source of current when a plug is inserted into the spring-jack, substantially as described.

3. The combination with a telephone-line
5 having a generator of momentary signaling-current at its substation, and an annunciator and a spring-jack switch in the line at the central station, of switch-contacts controlled by the armature of the annunciator, a local
10 source of current and circuit connections including said switch-contacts adapted to bring said local source of current into the line-circuit when the switch-contacts are closed, whereby the indicator of the annunciator is
15 displayed when the substation-generator is operated and remains displayed until a plug is inserted in the spring-jack, as described.

4. The combination with a telephone-line

having at its substation a generator of signaling-current and at its central station a spring- 20
jack switch and an annunciator in the line, of a resistance-coil interposed in the line between two windings of the annunciator, a local source of current in a normally open shunt or parallel circuit with the resistance-coil, and 25
switch-contacts controlled by the armature of said annunciator adapted to close the break in the normally open circuit, substantially as described.

In witness whereof I hereunto subscribe my 30
name this 7th day of April, A. D. 1896.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,

LUCILE RUSSELL.