

No. 634,095.

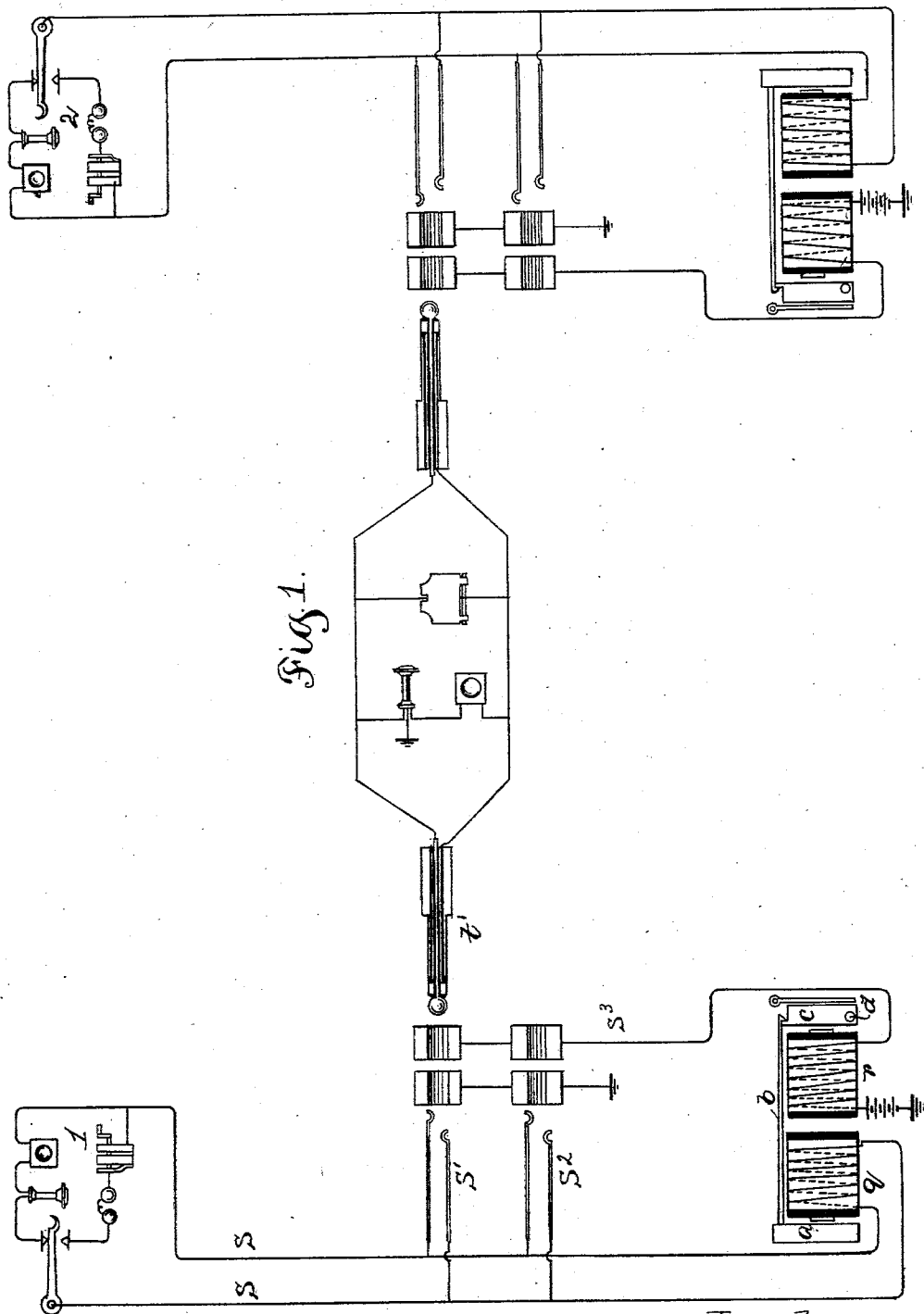
Patented Oct. 3, 1899.

C. E. SCRIBNER.
ELECTRIC ANNUNCIATOR.

(Application filed Feb. 4, 1892.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
George L. Cragg
George Mc Mahon

Inventor
Charles E. Scribner
By Barton & Brown
attys

No. 634,095.

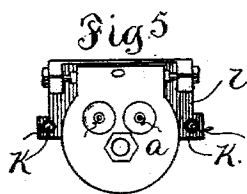
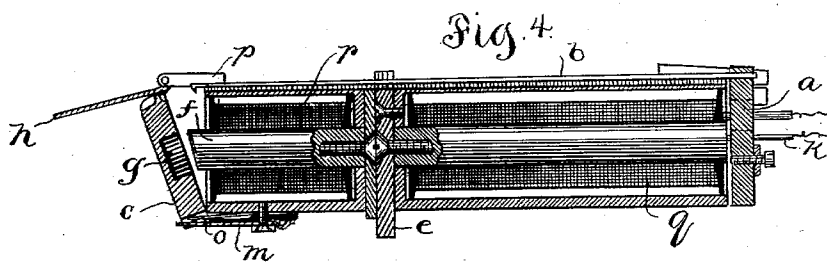
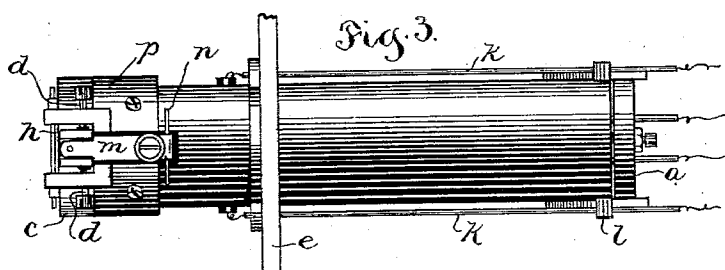
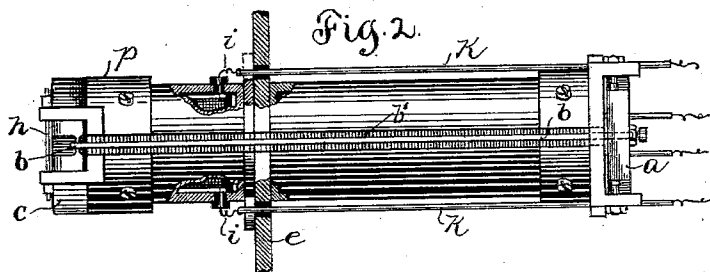
Patented Oct. 3, 1899.

C. E. SCRIBNER.
ELECTRIC ANNUNCIATOR.

(Application filed Feb. 4, 1892.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

George L. Cragg
George Mc Mahon

Inventor:
Charles E. Scribner
By Barton & Brown
Attys

UNITED STATES PATENT OFFICE.

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

ELECTRIC ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 634,095, dated October 3, 1899.

Application filed February 4, 1892. Serial No. 420,310. (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 Electric Annunciators, (Case No. 252,) 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 relates to electric annunciators; and in general its object is to improve the construction and action of such annunciators as are adapted to be used as individual annunciators in connection with telephone-exchange circuits.

Heretofore self-restoring annunciators have not been practically employed in telephone-exchange systems, the operators at the exchange being required to restore the shutters to their normal positions by hand after the calls have been received. Circuits, however, have been devised more especially for multiple-switchboard systems which contemplate the employment of self-restoring annunciators—that is to say, the call is sent by the subscriber and his individual annunciator or shutter thrown down. The operator at the central office by the act of plugging into the switch of the calling-subscriber's line automatically closes a circuit through a special coil provided on the annunciator, which excites the said magnet, so as to restore the shutter. In some instances the extra magnet or coil has acted in opposition to the main operating-coil upon the same armature, and sometimes a special armature has been provided in connection with the extra coil.

One feature of my invention consists in making the drop or indicating-piece of the annunciator of soft iron and combining therewith a curtain or shield, which is thrown up to disclose the face of the drop by the slight movement of the drop itself when released. This apron or shield when thus thrown up serves also as a target to readily catch the eye of the operator, so that her attention may be at once attracted to the particular annunciator that has been operated. When the operator plugs in the line of a subscriber who has thus operated his individual annunciator,

the drop is restored, since current is automatically sent through the extra coil.

Another feature of my invention consists in placing the main operating-electromagnet and the extra magnet of the annunciator end to end, the armature lever or hook of the main magnet being extended forward to normally engage with and hold up the armature of the extra electromagnet, which armature when released causes the indication or signal.

I preferably employ tubular magnets, and the two magnets of each annunciator are preferably mounted on opposite sides of a plate, which may be common to a large number of individual annunciators. Usually fifteen are mounted on a single plate. The shell of the restoring-magnet may be perforated on opposite sides near the plate, and the ends of the coil may be taken out through these openings, suitable bushings being provided in these openings to insulate the ends of the wire from the shield. These ends I solder, respectively, to rods passing back to the rear of the drop, one on each side thereof, said rods being insulated from the other parts of the annunciator. These rods are designed simply to carry the connections of the wires back to the rear of the annunciator, where it is most convenient to make the connections with the circuit-wires. A contact-piece is placed under the drop in such position that when the drop is released this contact will be closed to ground. Such contact-pieces have been heretofore employed in connection with individual annunciator-drops to close a night-signal circuit.

In the accompanying drawings, which are illustrative of my invention, Figure 1, Sheet 1, is a diagram illustrative of the circuits of two telephone-lines of multiple-switchboard system in connection with my self-restoring annunciators. Fig. 2, Sheet 2, is a plan view from above of one of my self-restoring annunciators, portions of the supporting-plate and of the shell surrounding the front or restoring-electromagnet coil being broken away to show the insulation of the connections with the wire of the coil of said magnet. Fig. 3 is a view of the same from below. Fig. 4 is a detailed longitudinal sectional view of the same, the armature form-

ing the drop and the curtain operated thereby being in position to indicate a call. Fig. 5 is a rear view.

Like parts are indicated by similar letters of reference throughout the different figures.

The armature *a* is provided with the hook *b*, which extends forward and normally engages with the drop *c*, pivoted at *d* to hold said drop *c* in the position shown most clearly in Fig. 2. The main operating-electromagnet is secured to the supporting-plate *e*, as best shown in Fig. 4, and directly opposite thereto is secured the restoring-electromagnet. The core *f* of the restoring-magnet is preferably extended so as to project into the recess or opening *g* provided in the drop *c*, in order that the drop *c*, which is of soft iron to act as an armature, may have a considerable range of movement within the influence of the said core *f*. Figures indicating the number of the annunciator are preferably provided upon the face of the drop *c*. I have found it especially desirable to provide a target having a greater range of movement than can be advantageously obtained with a drop *c* which is to be restored by magnetic attraction. I have therefore constructed the drop *c* to have only such a moderate range of movement when it is released that it will when it comes to rest be within the range of the restoring-magnet when the magnet is excited, and have provided additional to this drop the apron or target *h*, which is made quite light and pivoted, as shown, within the path of the beveled upper end of the drop, so that the curtain *h* will be thrown up, as shown in Fig. 4, when the drop is actuated. Thus the visual signal is made pronounced. I preferably make the apron *h* of aluminium, in order that it may be as light as possible.

The ends *i i* of the coil of the restoring-magnet are brought out, as shown most clearly in Fig. 2, through insulating-bushings inserted through the shell of said magnet. The rods *k k*, insulated from the plate *e*, as shown in Fig. 2, are connected with these wires *i i*. These rods *k k* extend back to the rear of the annunciator through bushings of insulating material provided in the frame *l*, which frame *l* carries also the pivots of the armature *a*. Thus all the connections with the annunciator may be made at the rear thereof.

The contact-piece *m* upon the lower side of the drop may be connected with any circuit—as, for example, circuit *n*—which it may be desired to ground. When the annunciator-drop *c* is released and falls to the position shown in Fig. 4, the spring *o* under the same is forced against the contact *m*, as shown. This spring *o* being connected with the main frame of the annunciator will serve as a ground connection for the contact *m*, as shown in Figs. 2 and 4. It will be observed that the latch or hook *b* passes forward through a notch provided in the plate *e* and between the different halves of the support *p* upon which the apron is hung. The shells of the magnet are

provided with a groove *b'* for the armature lever or hook *b*, thus permitting the same to lie close to the magnets. The annunciator 70 as a whole is made thus compact, and it will be understood that several will be mounted side by side quite near together upon a single strip *e*.

When my annunciator is used in telephone-exchange systems, the coil *q* of the operating-electromagnet will be included in the circuit of the telephone-line, while the coil *r* of the restoring-electromagnet will be included in a circuit-containing battery, which circuit will be automatically closed when connection is made with the line to which the annunciator belongs, and thus current being closed through said coil *r* the drop *c* will be attracted and thus automatically restored—that is to say the subscriber will send current through the coil *q* of the operating-electromagnet, thus operating armature *a* and the latch or armature-lever *b* carried thereby. The shutter *c*, which is normally held by said latch, is thus released and the apron thrown up to the position shown in Fig. 4. The operator at the board where the annunciator is placed seeing the signal answers the call by inserting a plug into the switch of the line containing the annunciator at her board, and the circuits are so arranged that the act of plugging into this switch closes circuit through the coil *r* of the restoring-electromagnet, and thus the said magnet is excited and the drop *c* is immediately restored.

I do not limit my invention to any particular circuit or systems of circuits; but for the purpose of illustrating the utility of my invention when applied to telephone-exchange systems I will briefly describe the circuits of Fig. 1.

The telephone-line *s* extends in metallic circuit from subscriber's station 1 to the series of switches *s' s'* on different switchboards and thence through the coil *q* of the operating-magnet of my individual annunciator. The test circuit or wire *s* connects from the front or insulated portions of switches *s' s'* through the coil *r* of the restoring electromagnet-battery to ground. The circuit of the subscriber of station 2 may be precisely the same as that of station 1. The subscriber on operating his generator sends current through coil *q* and so operates the annunciator. The operator seeing the signal inserts plug *t* into switch *s'*. Now it will be observed that the inner portion of the ring of this switch is provided with a ground connection and that the metallic sleeve upon the shank of the plug serves as a medium of electrical connection between the two parts of the ring or tube of the switch. Thus when the plug *t* is inserted the shorter spring of the switch is closed to the tip which is connected, as shown, with the tip-strand of the pair of cords, while the longer spring is connected to the insulated sleeve near the tip, which insulated sleeve is connected with the sleeve-strand of the cords.

I do not deem it necessary to further illustrate or further describe the operation of a telephone-exchange, since the foregoing description will be sufficient to make clear the best mode of using my invention.

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

1. The combination, with a supporting-plate, of two electromagnets mounted heel to heel on opposite sides thereof, the armatures of said magnets and the hook or latch extending from one armature to normally engage with the armature of the other to hold the same from falling, and circuits through the different magnets; whereby when current is sent through the magnet having the latch or hook, the armature of the other magnet is released, said armature being restored when current is sent through the electromagnet thereof.

2. The combination with a pivoted weight whose center of gravity falls without the axis of support, of an electromagnet whose armature when attracted is adapted to release said pivoted weight, said weight serving as the drop of an annunciator, of a curtain or target pivoted in front of the weight and being of less weight than the same, whereby the pivoted weight when released falls against the curtain near the pivoted axis thereof, to move the curtain a greater distance than the pivoted weight, substantially as specified.

3. The combination, with the operating-electromagnet, its armature and armature-lever hook, of the restoring-electromagnet and its armature provided with a latch, with which latch the hook is adapted to engage, circuits through the different magnets and switching devices, whereby on closing the circuit through the operating-magnet, the armature of the restoring-magnet is released to act as an annunciator-drop, said armature being attracted and restored to its engagement with the hook when circuit is closed through the restoring-magnet, substantially as specified.

4. The combination, with the operating-magnet and the restoring-magnet mounted end to end, of the rods $\frac{1}{2}$ $\frac{1}{2}$, with which the ends of the coils of the restoring-magnet are connected, said ends of the wire of the coils being insulated from the shell, and the rods being carried back to the rear of the annunciator, substantially as and for the purpose specified.

5. The combination, with a drop-shutter of soft iron pivoted below and to one side of its center of gravity, of a shield or apron placed near to and parallel with said drop-shutter pivoted at its upper edge, the upper edge of said drop-shutter engaging with said shield near its pivotal point, whereby said apron is pushed outwardly by the movement of said drop-shutter, substantially as described.

6. The combination, with the iron gravity-drop normally held by the hooked lever of the operating-magnet, of said lever, the retaining-magnet having its pole-piece extended, and the drop being provided with a recess corresponding to said extended pole, substantially as specified.

7. The combination, with the iron gravity-drop and the operating electromagnetic device for releasing the same, of the contact-closing spring closed by the drop when the drop is released, and the magnet with its pole presented to said drop and adapted to act directly thereon for restoring the drop and thereby permitting the circuit-closing spring to open, substantially as specified.

8. The combination in an annunciator, with the tubular electromagnetic devices, of the plate upon which they are mounted, the ends of the wire of the coils of one magnet being carried out through insulating-bushings in the shell thereof, said ends being extended by insulated rods through said plate to the rear of the annunciator, substantially as described.

9. The combination, with the tubular electromagnets placed end to end, of the armature lever or hook extending over both the said magnets, the shells of said magnets being provided with a groove for said lever to permit the same to lie close thereto, substantially as shown and described.

10. A self-setting annunciator having an electromagnet organized when excited to release the drop, and an auxiliary electromagnet organized to reset or restore the said drop by shortening or reducing the resistance of a magnetic circuit, including the core and armature of said electromagnet; substantially as described.

In witness whereof I hereunto subscribe my name this 22d day of January, A. D. 1892.

CHARLES E. SCRIBNER.

Witnesses:

M. JEANE TALLETT,
GEORGE L. CRAGG.