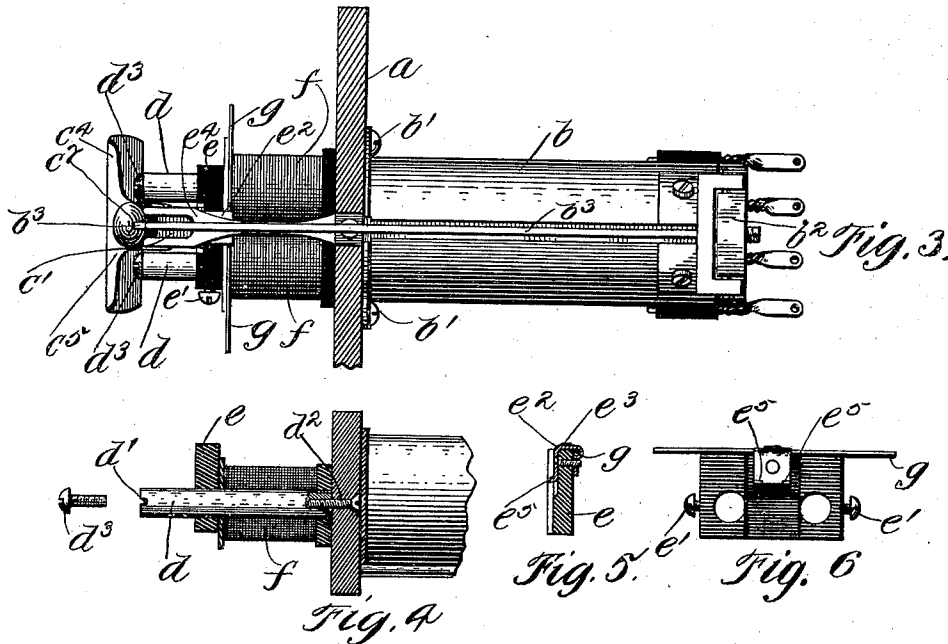
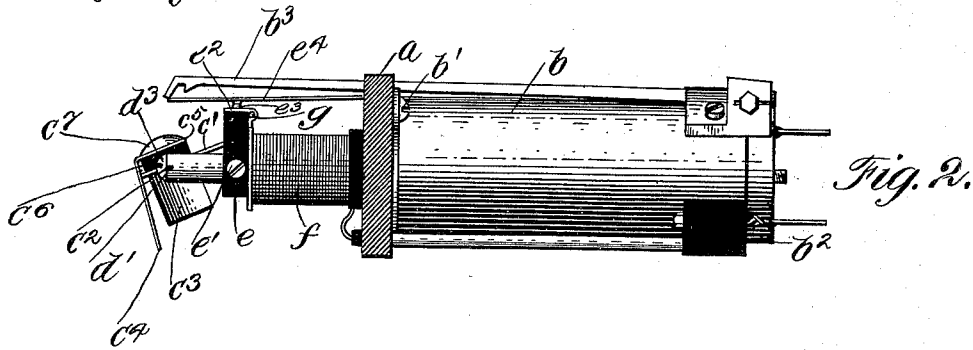
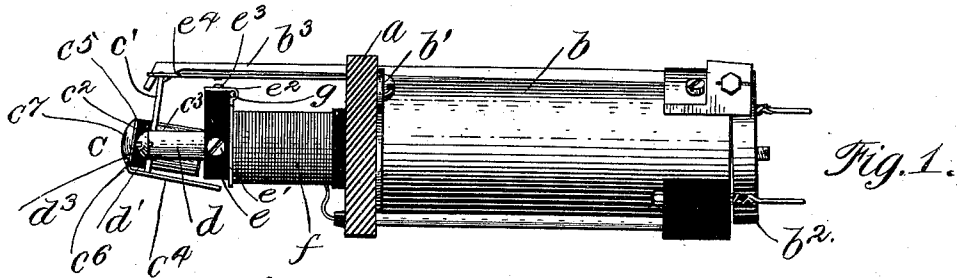


(No Model.)

J. STEINER.
SELF RESTORING ANNUNCIATOR.

No. 598,276.

Patented Feb. 1, 1898.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEF STEINER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE WESTERN
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SELF-RESTORING ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 598,276, dated February 1, 1898.

Application filed May 23, 1896. Serial No. 592,860. (No model.)

To all whom it may concern:

Be it known that I, JOSEF STEINER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Self-Restoring Annunciators, (Case No. 9,) 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 a self-restoring annunciator more particularly for employment in connection with telephone-switchboards.

The object of my invention is to provide an annunciator which shall be effective in operation, while the mechanical construction is such that the annunciator may be made at a minimum cost.

Upon the rear of a supporting-plate is mounted the usual annunciator-casing inclosing the core and the actuating-coil of the annunciator, the armature being mounted upon the rear end of the casing and carrying a lever or rod which extends through an opening provided in the supporting-plate and carries upon its end a hook which is adapted to engage and retain the annunciator-drop in its elevated position. Mounted upon the front of the supporting-plate and extending perpendicular thereto is provided a pair of cores for the restoring-electromagnet, an electromagnetic coil being mounted upon each of the cores. The cores are provided in their ends with slots, in which pins carried upon the annunciator-drop are adapted to rest, the slots serving as bearings in which the pins may rotate. The pins are maintained in the slots by means of screws passing into the ends of the cores. The annunciator-drop carries a retaining-arm adapted to be engaged by the hook upon the longitudinally-extending arm or lever carried upon the annunciator-armature. A plate or block of insulating material is slipped over the ends of the cores of the restoring-electromagnet and occupies a position between the coils of the magnet and the drop. A contact-anvil is mounted upon the block of insulating material, with which a spring is adapted to make contact when the annunciator-drop is released, to thus close a night-bell circuit. When the

annunciator is in its elevated position, the retaining-arm carried thereon engages the spring and moves the same out of contact with its contact-anvil to thus open the night-bell circuit. The annunciator-drop comprises a cylindrical armature upon which are mounted the target of the drop and the retaining-arm, the axis of the armature being adapted to lie in a position more or less parallel with the cores of the restoring-electromagnet when the drop is in its elevated position, the armature moving into an angular position, due to its own weight, when the drop is released. Upon closing circuit through the coils of the restoring-electromagnet the annunciator is moved into a position to restore the drop, due to the tendency of the lines of force to shorten their path through the armature.

I will describe my invention by reference to the accompanying drawings, in which—

Figure 1 is a view in elevation of the annunciator of my invention, the annunciator-drop being shown in its elevated position—that is, with the target in its undisplayed position. Fig. 2 is a similar view showing the annunciator-drop moved into position to display the target. Fig. 3 is a plan view of the annunciator. Fig. 4 is a sectional view showing the annunciator-drop in a detached position. Fig. 5 is a sectional view of the insulating-block and the contact-anvil supported thereon. Fig. 6 is a plan view thereof.

Like letters refer to like parts in the several figures.

Upon the rear of the supporting-plate *a* is mounted the annunciator-casing *b*, the casing being secured to the rear of the supporting-plate by means of screws *b'* *b'*. The core and the actuating-coil of the annunciator are inclosed within the casing *b*, and the armature *b²* is pivoted to the rear end of the casing. Mounted upon the armature *b²* is the retaining-lever *b³*, which extends longitudinally and passes through an opening or slot provided in the supporting-plate *a*. The retaining-lever carries upon its end a hook adapted to engage the retaining-arm *c'* of the annunciator-drop *c* to maintain the annunciator-drop in its elevated position. Upon the edges of the plate *c'*, comprising the retaining-arm, are provided pins *c²*, adapted to rest in slots *d'*, provided

in the ends of the cores $d d$ of the restoring-electromagnet, the cores $d d$ being mounted upon the front of the supporting-plate a through the agency of screws d^2 , passing into the ends of said cores from the rear of the supporting-plate. Screws d^3 screw into the forward ends of the cores to maintain the pins c^2 within the slots d' . Upon the under face of the plate c' is mounted the cylindrical armature c^3 . The target c^4 is formed of a thin plate of metal, preferably aluminium, and carries an angular portion c^5 , between which and the plate c' a washer c^6 is interposed, the several parts of the drop being secured together by means of a screw c^7 , the head of which rests against the angular portion c^5 of the target and the threaded shank of which engages a tapped hole provided in the armature c^3 . A block e of insulating material is provided with holes through which the cores $d d$ may pass, the block being slipped over the ends of the cores before the annunciator-drop is placed in position and is maintained in position against the ends of the coils $f f$ of the restoring-electromagnet through the agency of set-screws e' . Upon the upper end of the block e is mounted a plate e^2 , carrying a contact-anvil e^3 , adapted to be engaged by the spring e^4 , which is secured by its end to the supporting-plate a .

When the annunciator-drop occupies the position illustrated in Fig. 1, the arm c' engages the spring e^4 and moves the same out of engagement with the contact-anvil e^3 . When the annunciator-drop occupies the position illustrated in Fig. 2, the spring e^4 rests in contact with the anvil e^3 , thus closing the circuit through the night-bell, which may be connected in circuit with the spring e^4 and anvil e^3 . The plate e^2 carries projections e^5 upon its end, adapted to be engaged by the retaining-arm c' when the arm occupies the position illustrated in Fig. 2. A transversely-extending wire g is clamped between the block of insulating material e and the plate e^2 , the wire being thus in electrical connection with the contact-anvil e^3 . The wire g may thus be electrically connected with the plates e^2 of all the annunciators arranged in a horizontal row and may be connected with one side of the night-bell circuit, while the metallic retaining-plate a , upon which the spring e^4 is mounted, may be connected with the other side of the night-bell circuit, so that the actuation of any one of the annunciators will act to close the night-bell circuit.

Normally the annunciator-drop occupies the position illustrated in Fig. 1, with the retaining-arm c' in engagement with the hooked end of the retaining-lever d^3 . When the annunciator is actuated, the armature b^2 is rocked upon its pivot, and the lever b^3 is moved to release the retaining-arm c' of the annunciator-drop, thus permitting the drop to assume the position illustrated in Fig. 2, the target c^4 being thus displayed. The axis of the armature c^3 now occupies an angular

position relatively to the cores of the restoring-electromagnet, and when current is sent through the coils $f f$ of the restoring-electromagnet the armature c^3 is attracted and drawn into the position illustrated in Fig. 1, due to the tendency of the lines of force to decrease the reluctance of the magnetic circuit. The retaining-arm c' is thus brought into engagement with the hooked end of the retaining-lever d^3 and the annunciator-drop is locked in its elevated position. When the annunciator-drop is released and the retaining-arm c' removed from beneath the spring e^4 , the spring moves into engagement with the contact-anvil e^3 , thus closing the night-bell circuit, and when the annunciator-drop is moved back to its inactive position the spring e^4 is moved out of engagement with the contact-anvil by means of the retaining-arm c' .

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

1. The combination with the supporting-plate, of the cores of the restoring-electromagnet secured thereto by means of screws passing through the retaining-plate and into the ends of said cores, a drop provided with pins adapted to fit into slots provided in the ends of said cores and screws passing into the ends of said cores to maintain said pins within the slots; substantially as described.

2. The combination with the supporting-plate, of the cores of the restoring-electromagnet mounted thereon, coils provided upon said cores, an annunciator-drop pivoted upon the ends of said cores and provided with a retaining-arm, an insulating-block mounted upon said cores and carrying a contact-anvil, and a contact-spring mounted upon said retaining-plate and adapted to engage said contact-anvil, said spring being raised out of engagement with the contact-anvil by means of said retaining-arm; substantially as described.

3. The combination with the cores mounted upon the retaining-plate, of the annunciator-drop journaled in the ends thereof and comprising the armature c^3 , target c^4 , plate c' and the screw c^7 securing the several parts of the annunciator-drop together; substantially as described.

4. The combination with the supporting-plate a , of the cores $d d$ mounted thereon, coils $f f$ and insulating-block e mounted upon said cores, the annunciator-drop c carrying pins adapted to enter slots provided in the ends of said cores, said annunciator c comprising the armature c^3 , target c^4 , retaining-plate c' , washer c^6 and screw c^7 , and the screws $d^3 d^3$ passing into the ends of the cores $d d$ and maintaining the pins on the annunciator-target in position; substantially as described.

5. In combination in a self-restoring annunciator, an electromagnet having extended pole-pieces, an armature pivoted at one extremity to the ends of said pole-pieces, a tar-

get carried by the armature, another electromagnet, an armature therefor, and a catch controlled thereby adapted to engage the target when the said first-mentioned armature
5 is attracted by its magnet, substantially as described.

6. In a self-restoring annunciator, the combination with an electromagnet having polar extension, of an armature mounted between
10 said polar extensions adapted to be rotated thereby to move approximately into their plane when the electromagnet is energized, a target or signal actuated by said armature, a second electromagnet, an armature therefor
15 and a catch controlled by said armature adapted to withhold the target normally from its position of display, substantially as described.

7. In a self-restoring annunciator, a rotatably-mounted armature and a target actuated

20 thereby in combination with a retaining-lever adapted normally to withhold said target from its position of display, an electromagnet, an armature therefor actuating said lever to release the target when the electromagnet is
25 energized, and a restoring-electromagnet provided with extended pole-pieces between which the first-named armature is rotatably mounted, whereby the target is moved from
its displayed position when said restoring-
30 electromagnet is energized, substantially as described.

In witness whereof I hereunto subscribe my name this 4th day of November, A. D. 1895.

JOSEF STEINER.

Witnesses:

W. T. CARLETON,

A. C. GRAY.