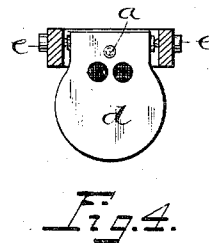
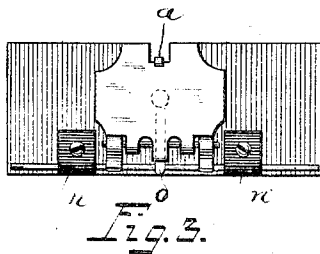
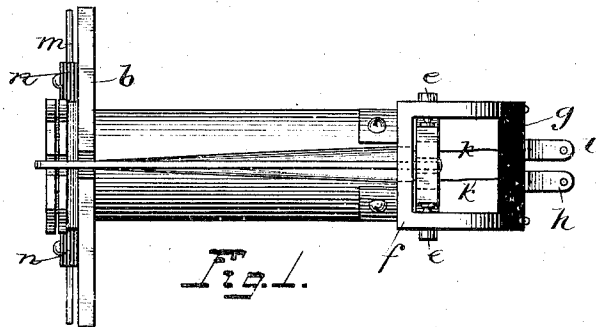
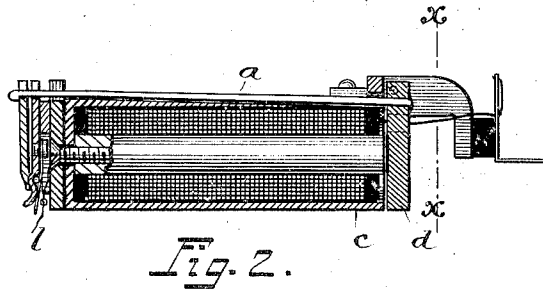


(No Model.)

J. C. WARNER.
ELECTRIC ANNUNCIATOR DROP.

No. 477,616.

Patented June 21, 1892.



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES C. WARNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN
ELECTRIC COMPANY, OF SAME PLACE.

ELECTRIC-ANNUNCIATOR DROP.

SPECIFICATION forming part of Letters Patent No. 477,616, dated June 21, 1892.

Application filed June 17, 1889. Serial No. 314,612. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. WARNER, 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-Annunciator Drops, (Case No. 3,) 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 of the class usually employed as individual signaling devices in telephone-exchange systems; and its objects are, first, to provide a soft-iron shield about the coil, so as to prevent as far as possible inductive effects between the coils of the different magnets when placed near each other; second, to provide for moving the hook which holds the shutter forward slightly at the same time the hook is lifted, so as to make the action of the annunciator more delicate or sensitive; third, to provide a special wire independent of the heel-plate as a common return-wire for the local circuits of several shutters or a group of shutters; fourth, to make the different electro-magnets, together with their armatures, readily removable, and, fifth, to provide for carrying out the ends of the wires of the coil of each annunciator to separate connecting-pieces at the rear, so that they may be readily accessible.

With these objects in view my invention consists, first, in providing a soft-iron cylinder about the coil of each magnet; second, in mounting the hook which extends forward from the armature at a point below the axis or pivotal support of said armature, so that the hook will be moved forward slightly when the armature is attracted; third, in mounting a wire upon the iron plate in position to be in the path of the local contact-spring of the annunciator when the same is forced backward by the falling of the shutter; fourth, in the manner of mounting the annunciators upon the supporting-plate, and, fifth, in providing an opening or openings in the armature and an insulated support at the rear of the same, upon which are mounted connecting-pieces, the different ends of the coil be-

ing carried back to said connecting-pieces to make the connections readily accessible at the rear.

My invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of an annunciator embodying my improvements. Fig. 2 is a vertical longitudinal central sectional view thereof. Fig. 3 is a front elevation thereof. Fig. 4 is a rear elevation as seen from line *x x* of Fig. 2.

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

The armature-lever *a* extends forward through a slot provided in the iron plate *b* after the manner described in my patent, No. 266,405, dated October 24, 1882, for electric annunciators, the soft-iron cylinder or shield *c* being cut away, as shown, so as to give room for this lever or hook.

The armature *d* is pivoted at pivots *e* above the rear end of the lever. Thus movement of the armature toward its pole tends to thrust the lever forward at the same time it is lifted, very slight movement of the armature and slight attractive force thus being sufficient to release the shutter, so as to cause it to fall.

The frame or fork *f* is secured, as shown, to the shield *c*, its arms or prongs extending backward and serving as a support for the block of rubber *g*, upon which are mounted the connecting-pieces *h i*. The wires *k*, forming the terminals or ends of the helix, are carried back through the armature *d* and connected, as shown, respectively, with contact-pieces *h* and *i*. In this manner the terminals of the coils are made accessible at the rear of the annunciator for connection with the circuit into which the annunciator is to be introduced. This frame *f* may be made conveniently of brass. The pivots *e* may be inserted through the arms of this frame, as shown. The screw *l* is inserted from the front through the plate *b*, and the end of the soft-iron shield into the core, this single screw serving to hold the electro-magnet of the annunciator in proper position at the rear of the plate, while at the same time the core is held in proper relation to the shield. By simply removing this screw

any electro-magnet, together with its armature and lever, may be taken off for inspection or repair.

Upon the front of the plate *b* and under each annunciator I mount a wire *m*, the rubber pieces *n* being secured to the plate and the wire being supported thereby and insulated from the plate, as shown. When the shutter falls, the local-circuit closer is brought into contact with the wire *m*.

Annunciators thus constructed are specially designed to be used in close proximity one to another and are found to be more sensitive and reliable and more convenient for connection of the wires than any heretofore used, magnetic induction between the cores being prevented by the soft-iron shields which are placed over the different coils.

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

1. The combination, with the coil or helix, of a soft-iron shield surrounding the same, the armature at the rear of the core of said helix, and the armature-lever extending forward through a slot or opening in the plate *b*, and the drop with which said lever is adapted to be engaged when the drop is lifted and to be disengaged therefrom when the armature is attracted, substantially as and for the purpose specified.

2. The combination, with the coil or helix,

of a soft-iron shield surrounding the same, the armature at the rear of the core of said helix, and the armature-lever secured to the armature below the pivotal support thereof and extending forward through a slot or opening in the plate *b*, and the drop with which said lever is adapted to be engaged when the drop is lifted and to be disengaged therefrom when the armature is attracted, substantially as and for the purpose specified.

3. The combination, with the soft-iron shield about the helix of an annunciator, of the frame *f*, mounted thereon and extending to the rear, the armature pivoted to said frame, and the connecting-pieces mounted thereon at the rear, and the different ends of the wire of the helix being connected, respectively, with said connecting-pieces, substantially as and for the purpose specified.

4. The annunciator provided with the armature *d*, provided with openings, the ends of the wire of the helix being carried back through said openings in said armature and connected with insulated connecting-pieces *h* *i*, respectively, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 11th day of June, A. D. 1889.

JAMES C. WARNER.

Witnesses:

ELLA EDLER,
GEORGE P. BARTON.