No. 699,140. Patented May 6, 1902.

C. C. BLAKE.

ELECTRICAL ANNUNCIATOR.

(Application filed Sept. 26, 1901.)

(No Model.)

Fig. 1.

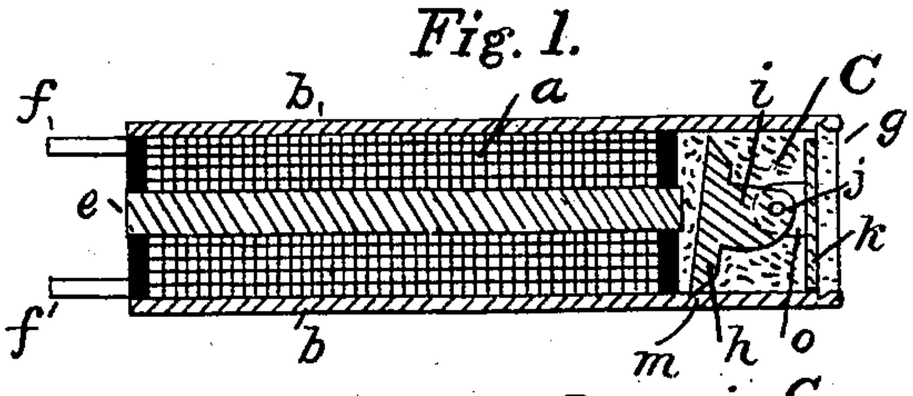
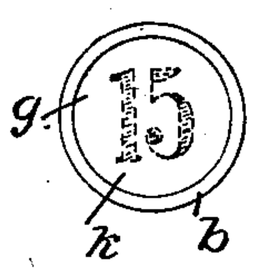


Fig. 2.



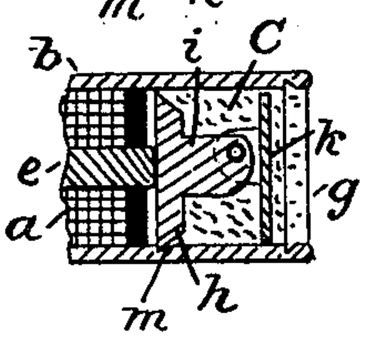


Fig. 3.

Fig. 4.

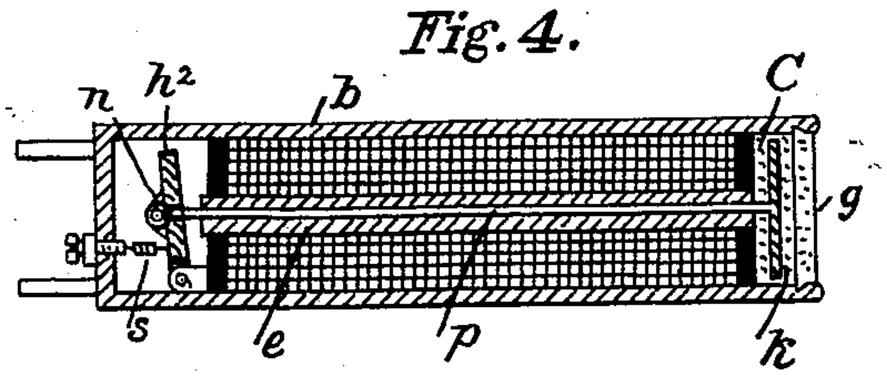


Fig. 5.

Fig. 6.

WITNESSES:

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ELECTRICAL ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 699,140, dated May 6, 1902.

Application filed September 26, 1901. Serial No. 76,646. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CHANDLER BLAKE, residing at Brookline, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Electrical Annunciators, of which the following is a specification.

The present invention relates to electric annunciators such as are employed in elevators, hotels, and especially at the operators' tables of telephone-switchboards. In such annunciators it has become a *sine qua non* that the signal shall not only be made or displayed quickly, but that means must be provided for resetting or erasing the signal automatically and without manual manipulation, in order that the operator's time may be entirely devoted to making connections between the terminal sockets of the substation-circuits associated with the section of the switchboard in her charge.

The invention is preferably described in connection with an annunciator of the tubular type, in which an electromagnet is inclosed in an iron sheath, the terminals of the helices being brought out to pins on one end of the electromagnet, to which the line conductors are soldered. Upon the opposite end of the electromagnet is arranged a chamber whose walls are prolongations of the tube inclosing the electromagnet, into the end of which is hermetically sealed a window of glass. Within the chamber in proximity to the end of the electromagnet is an armature, preferably in the form of a truncated cone, whose resting edge is secured in a depression in the floor of the chamber, although an armature pivoted to the said floor is quite sufficient. Attached to a forwardly-projecting arm of the armature is the signal-target, having a white face so arranged with the armature that when the latter is not attracted to the pole of the electromagnet the target will be pressed against the inner surface of the glass window and its white face will be visible there, and when it is attracted to the said pole the target will be withdrawn from the said window. The chamber containing the armature and target is filled with a dark-colored fluid of about the same mobility as water, and when the target is pressed against the window the fluid is displaced and the target-face is visible; but when the target is withdrawn the liquid flows in between the face of the same and the inner surface of the glass window, and owing to its dark color it conceals the face of the target, so that it is not visible, the color of the fluid forming what may be termed a "signal of color."

Any suitable coloring-matter which will conceal the face of the target (which may be of any shade than white, if preferred) may be employed.

Although I describe herein two constructions of annunciators embodying the invention, I do not confine myself to any special form of the annunciation, as I conceive the invention to consist, broadly, of an annunciator composed of an electromagnet whose armature is adapted to operate a target in a colored fluid toward and from a transparent window, to be visible when in proximity to said window and to be concealed by said colored fluid when away from the window.

Of the accompanying drawings, Figures 1 and 3 are sectional views, and Fig. 2 is an end view, of a preferred form of annunciator. Fig. 4 is a horizontal sectional view of a modification, and Figs. 5 and 6 are respectively a horizontal and a cross-section of another modification.

Referring to the first three figures, *a* is an electromagnet inclosed in an iron sheath *b*, which projects beyond the end of the electromagnet at one end thereof and is provided with an internal groove, in which is secured a glass disk *g* to serve as a transparent window and to form and close a hermetically-sealed chamber C. Within this chamber is a tilting armature *h* in the form of a truncated cone and having an arm *i* extending from its end pivoted at *j* to the arm *o*, projecting from the rear of the disk-target *k*. In the unattracted position of the armature, as indicated in Fig. 1, the target presses against the inner surface of the glass window *g*. The front or face of the target is of some distinctive color, as white, and may bear upon its face a letter or numeral to individualize the annunciator. The letter or numeral may be placed upon the glass *g*, if preferred. The chamber C is filled with a liquid, as water, having in solution some coloring-matter which will form a contrast with the color of the face of the target. If the target-face is white, the water may have in solution nigrosine, a blue-

black coal-tar dye, or some other substance which will render the water black. The helices of the electromagnet are connected to the line conductors of a circuit by the pins *f f*, and when a current of electricity passes through the electromagnet its core *e* becomes magnetized and *a* attracts the armature *h* to its pole, and the target *k* is withdrawn from contact with the glass window *g* into the position shown in Fig. 2. While the target is in the position shown in Fig. 1, the fluid is forced away, so that the symbol on the face of the target is plainly seen through the window; but when the target is in the attracted position (shown in Fig. 2) the fluid passes between the face of the target and the window and conceals the said face, the window then presenting a black aspect. I may arrange the connections between the armature and the target to reverse the indications, so that when the armature is unattracted the window will be black, and when it is attracted the target will be seen, and in Fig. 4 I have shown that this may be done by a modification in construction. In this case the target is attached to a rod *p*, which passes through a hole in the center of the core *e* to the opposite end of the annunciator, where it is pivoted to the armature h^2, the armature itself being hung in the ordinary manner and held retracted by a spring *s*. When the armature h^2 is attracted, the target is held against the inner face of the winding *g*, and when it is attracted the target *a* is pulled away by the spring *s*.

In Figs. 5 and 6, the latter being a section on line *x x* of the former, the armature *h* is cut away, as indicated at *t*, and a hole *u* is made at the apex or central part, into which rests the end *w* of the tilting support *s*, whose lower end is held in the groove *m* in the floor of the tube *b*. The target *k* is preferably a disk of white glass secured to the face of the armature. In its unattracted position the armature and target rest against the window *g*, as shown in Fig. 5, and when attracted to the pole of the electromagnet they are carried over thereto by the tilting lever or support *s*.

As has been indicated, many forms may be devised to embody the invention without departing from the spirit thereof.

I claim as my invention—

1. The combination in an annunciator, of an electromagnet, an armature, and a hermetically-sealed chamber, a colored or opaque fluid inclosed therein, the walls of the chamber provided with a transparent window and inclosing a signal-target adapted to be visible when in proximity to said window and to be concealed by the said fluid when away from the window.

2. The combination in an annunciator of an electromagnet, an armature, and a hermetically-sealed chamber, colored or opaque fluid inclosed therein, the walls of the chamber provided with a transparent window and inclosing a signal-target adapted to be influenced by the electromagnet to approach and recede from the said window.

3. The combination in an annunciator of an electromagnet, a self-retracting armature, a hermetically-sealed chamber, colored or opaque liquid inclosed therein, the walls of the chamber provided with a transparent window and inclosing a signal-target, the said armature operatively connected with the signal-target.

4. The combination in an annunciator, of an iron sheath, an electromagnet, a self-retracting armature, a hermetically-sealed chamber, colored or opaque liquid inclosed therein, the walls of the chamber provided with a transparent window and inclosing a signal-target, the said armature mechanically and operatively connected with the signal-target.

5. The combination in an annunciator, of an electromagnet, having a tilting or self-retracting truncated cone-shaped armature, a hermetically-sealed chamber, colored or opaque liquid inclosed therein, the walls of the chamber provided with a transparent window and inclosing a signal-target, the said armature mechanically and operatively connected with the signal-target.

6. The combination in an annunciator, of an iron sheath, an electromagnet within the said sheath, a self-retracting armature, a hermetically-sealed chamber whose walls consist of a prolongation of said sheath, colored or opaque fluid inclosed therein, the walls of the chamber provided with a transparent window, and a signal-target within said chamber.

7. The combination in an annunciator, of an electromagnet, an armature, a hermetically-sealed chamber, colored or opaque liquid inclosed therein, the walls of the chamber provided with a transparent window, a signal-target operated by said armature to displace the liquid from the said window and to permit the same to flow between its face and the window.

8. The combination in an annunciator of an iron sheath, an electromagnet in the said sheath, a hermetically-sealed chamber at one end of the said magnet whose walls are prolongations of the sheath, provided with a transparent window and opaque liquid inclosed therein, an armature pivoted to a target in said chamber adapted to displace the liquid between the face of the target and the window and permit the said liquid to flow between the said face and the window.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of September, 1901.

CHAS. CHANDLER BLAKE.

Witnesses:
STRAFFORD WENTWORTH,
CHAS. H. HOBBS.