(No Model.)

W. H. LANE & F. S. PERRIN.

VISIBLE SIGNAL DEVICE.

No. 520,365. Patented May 22, 1894.

Fig. 1.

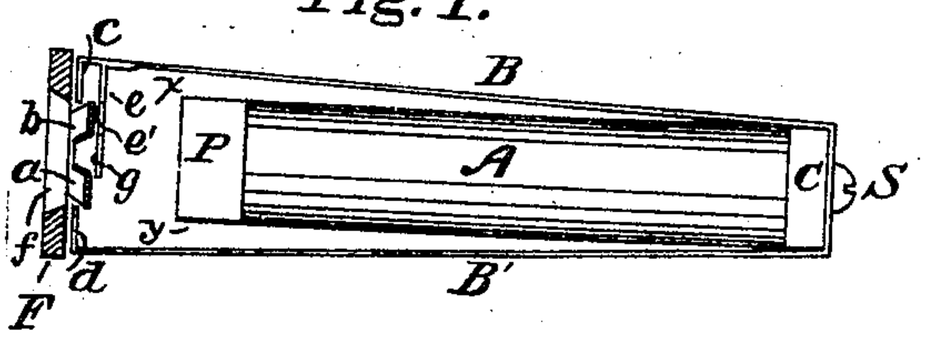


Fig. 2.

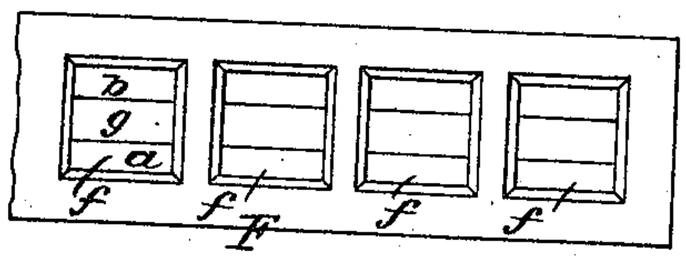


Fig. 3.

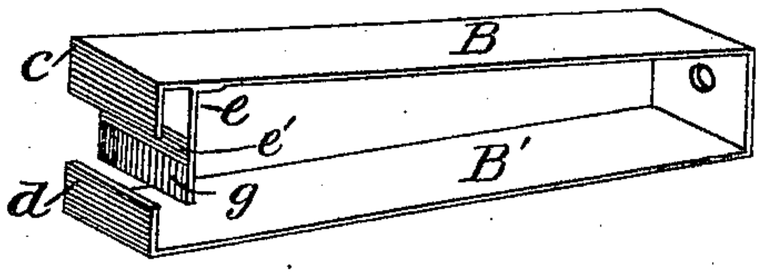


Fig. 4.

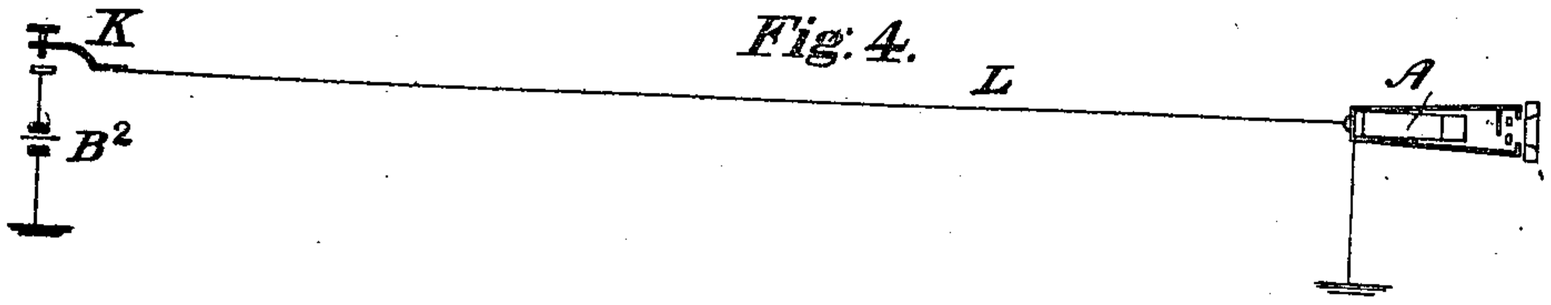
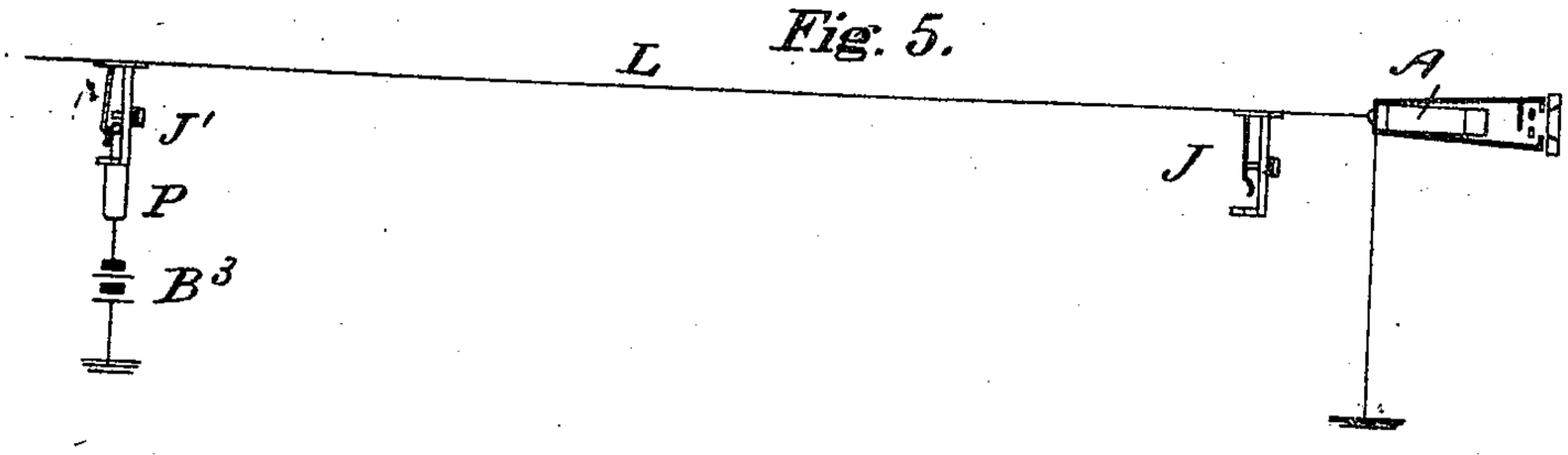


Fig. 5.



Attest.
Geo. Lewis.
Samuel N. Fisher

Inventors:
William H. Lane and
Frederic S. Perrin
by Foster Freeman,
their attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM H. LANE, OF BROOKLYN, AND FREDERIC S. PERRIN, OF NEW YORK, N. Y., ASSIGNORS TO THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY, OF NEW YORK.

VISIBLE SIGNAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 520,365, dated May 22, 1894.

Application filed March 12, 1894. Serial No. 503,328. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. LANE, of Brooklyn, and FREDERIC S. PERRIN, of New York, N. Y., have invented certain Improvements in Visible Signal Devices, of which the following is a specification.

Our invention relates to visible signal devices employed in electrical circuits for the purpose of calling attention to the line with which they are associated, and to indicate to an attendant any prearranged signal.

The invention relates to a special form of electro-magnetic visible signals, denominated automatic resetting annunciators or signals, in which the display and also the withdrawal of the signal are controlled by the attraction and retraction of the armature of the magnet.

The special object of our invention is to provide a signal device which will quickly attract the eye by totally changing the appearance of the target, or more specifically by changing the color of the target from a complete surface of one color to a complete surface of another color, the two colors being distinctively different from one another.

The invention also relates to a special form of target without pivots, by means of which all trouble occasioned by dust and friction of parts is obviated.

Our signal device consists of an electro-magnet, preferably of a single helix, one pole of which is enlarged to form active faces parallel with the core, and of armatures of very thin sheet iron secured to the opposite end of the core and extending forward so that when attracted they are substantially parallel with the length thereof. These armatures are in inductive proximity to the enlarged pole piece, and at their free ends are bent inwardly to form signal shutters or targets, in the rear of an apertured face plate, through the aperture of which they are displayed. In the rear of the face plate, and extending across its aperture are bars having their ends secured permanently to the back of the said plate. Normally when the armatures are retracted by their own resiliency from the inductive polar extension or enlargement, a portion of the surface of one of the said signal shutters or targets, which is behind the cross-bars, invisible between them and this portion of the surface of the shutter is colored to correspond with that of the bars, so as to display at the plate aperture a surface or expanse of uniform color. When the armatures are attracted toward the polar extension, other shutters, targets, or bars come into view at the plate aperture and obscure or cover the aforesaid shutter and bars, and the shutters or targets thus brought into view present a distinctively different appearance, or contrasted color. Their several surfaces are painted alike, and the color thus brought into view continues to be displayed as long as the current circulates through the helix; and upon the cessation thereof the armatures are retracted, exhibiting once more the surfaces bearing the normal color, all of which I will now proceed to describe and point out in detail in the claims.

Of the accompanying drawings Figure 1 is a side view of the invention, showing the face plate in section. Fig. 2 is a front view of a face plate showing three apertures. Fig. 3 is a perspective view of the armatures detached from the helix, and Figs. 4 and 5 illustrate the operation of the signal device when included in electric circuits.

Referring to Figs. 1, 2 and 3—A is an electro-magnet the core of which is enlarged or extended at one end P, to provide inductive or attractive surfaces *x*, *y*.

B and B′ are armatures preferably made of one piece of thin sheet iron, bent as shown, to embrace the end C of the helix spool, and secured thereto by the screw S. The armatures extend forward over the polar extension P, and flare slightly away therefrom, and at their ends bend inwardly to form targets or shutters; the armature B terminates in target *c*, and armature B′ in target *d*. The armature B is provided with a duplicate target *e*, consisting of a piece of sheet iron secured thereto at a little distance inward from the target *c*.

F, is a face plate, which in a strip or row of visible signals, extends in front of them all, and has apertures *f* through which the targets are displayed; slightly in the rear of this plate are the cross bars *b* and *a*, which may be of metal; these are secured to the

plate, the space between the plate and the bars being sufficient for the targets *c* and *d* to move freely in without touching.

In the position shown in Fig. 1, where the armatures B and B′ are retracted, the surface of the bars *a* and *b* and the lower surface *g* of the target *e* cover the aperture *f*, and these surfaces are painted the same color and constitute a solid or uniform color signal; when the armatures are attracted to the surfaces of the polar extension P, the targets *c* and *d* move in front of and cover the bars *b* and *a* respectively, and the upper surface *e′* of the target *e*, moves down and covers the space between the bars, and as the surfaces of the targets *c* and *d* and the upper surface *e′* of target *e* are painted the same color, a solid color signal is again seen at the aperture *f*. The color signals are sufficiently distinctive in color to readily and quickly catch the eye, as for example the normal solid color may be white, and the abnormal color be red, black or blue.

Fig. 4 illustrates our visual signal in connection with a line L operated by a key K, and serves as a type of hotel or other annunciator systems, and Fig. 5 shows the signal in connection with switchboards.

L represents a trunk wire between two switchboards, J′ being the spring jack of the calling end connected by plug P to ground through battery B^4, and J a connecting spring-jack at the opposite end of the wire.

Of course without departing from the spirit of our invention we may by the same or closely similar means provide that the signal shall be given by changing from a normal solid color to a barred surface formed of two or more colors or vice versa.

Having now fully described our invention, we claim—

1. An annunciator or visible signal indicator consisting of an electro-magnet having armatures provided with signal shutters or targets, as described upon their free ends; and an apertured face plate, provided with bars across its aperture, as set forth; whereby when the armatures are retracted, a normal color is displayed at the aperture, and when the armatures are attracted to the electro-magnet a surface of different color is displayed at the said aperture, as and for the purpose set forth.

2. An annunciator or visible signal indicator, consisting of an electro-magnet having armatures secured to one pole of the electro-magnet and in inductive relation with the other pole thereof, and provided with signal shutters or targets as described, upon their free ends; and an apertured face plate provided with bars across its aperture, as set forth; whereby when the armatures are retracted a normal color is displayed at the aperture, and when the armatures are attracted to the electro-magnet a surface of different color or colors is displayed thereat, as and for the purpose set forth.

3. An annunciator or visible signal indicator, consisting of an electro-magnet with a polar extension, having two armatures of thin elastic iron secured to one pole of the electro-magnet and extending forward in inductive relation with the said polar extension, their ends being provided with signal shutters or targets as described; and an apertured face plate provided with rigid or immovable bars across its aperture as set forth; the said shutters and bars being colored as described; whereby when the armatures are retracted a normal color is displayed at the said aperture, and when the armatures are attracted to the polar extension a different color is displayed thereat.

4. A visible signal device comprising an actuating electro magnet, spring armatures carrying signal targets, and an apertured face plate, and means as indicated, for the display at said face plate of two distinctive signals, said means comprising for one signal rigid bars of given color crossing the aperture of said face plate, and a correspondingly colored section of one of the armature targets normally placed to show itself between the said bars; and for the second signal two other diversely colored targets carried by the two armatures respectively, and arranged to move in front of the said colored bars, and a correspondingly colored separate section of the first named target arranged to replace the first named section thereof, substantially as specified.

5. An annunciator or visual signal indicator, comprising an electro-magnet, an apertured face plate in front of said magnet, a display surface of uniform color normally visible through said aperture, and armatures for said magnet carrying targets or shutters movable toward each other by the attraction of said armatures, and thereby displaying a surface colored in contrast with that of the normal color signal, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 8th day of March, 1894.

WILLIAM H. LANE.
FREDERIC S. PERRIN.

Witnesses:
HENRY W. MAY,
W. H. FREEMAN.