(No Model.) 2 Sheets—Sheet 1.

A. BRADFORD.

Automatic Electric Annunciator.

No. 238,756. **Patented March 15, 1881.**

FIG. 2.

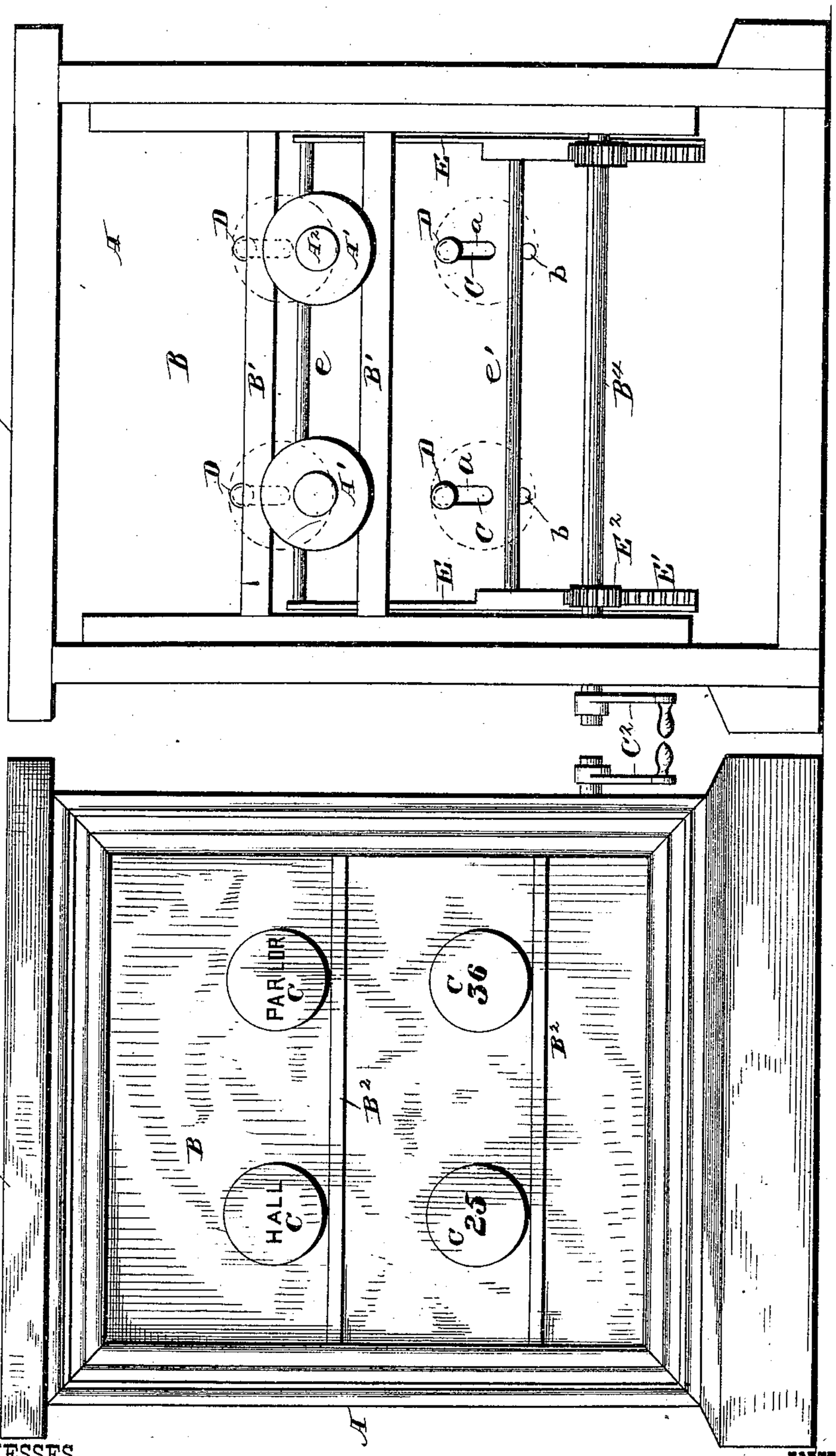

FIG. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

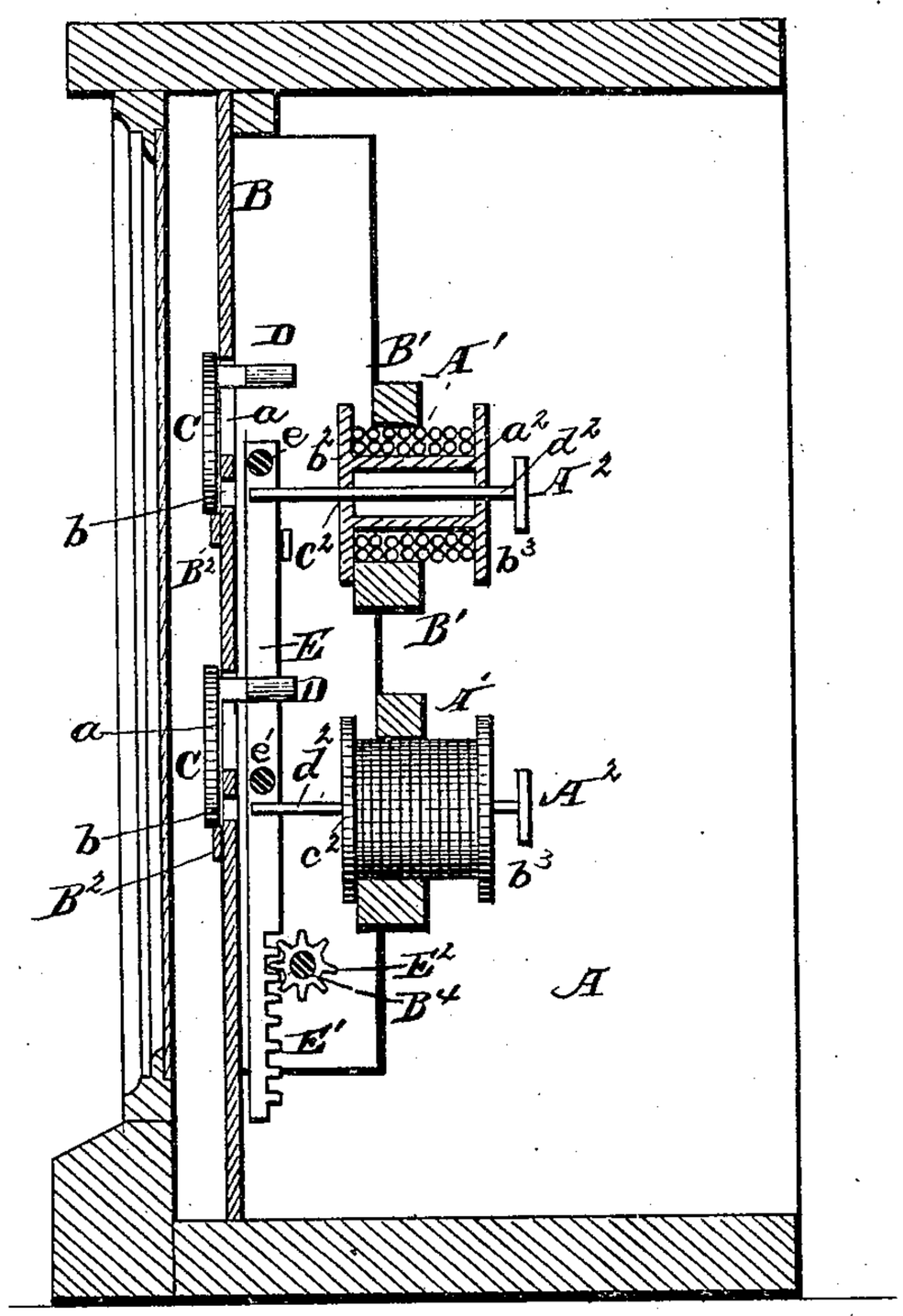
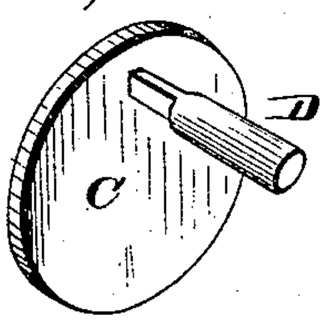


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

ADDISON BRADFORD, OF BROOKLYN, NEW YORK.

AUTOMATIC ELECTRIC ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 238,756, dated March 15, 1881.

Application filed December 29, 1880. (No model.)

To all whom it may concern:

Be it known that I, ADDISON BRADFORD, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Automatic Electric Annunciators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in automatic electric annunciators.

Heretofore annunciators of the class indicated have been of very complicated construction, and hence have required great nicety of adjustment to their successful operation. Such devices have also demanded a great amount of electrical force, for, in addition to moving the train and performing their indicating or annunciating function, considerable force is necessary to overcome the friction of the component parts. Train mechanism actuated by weights or springs has been employed in connection with some forms of annunciators; but the benefits of their presence is more than outweighed by the additional expense of first cost and repair which they incur.

The object of my invention is to obviate these difficulties by providing an annunciator of extreme simplicity of construction and operation, composed of few parts, and requiring a minimum of electrical energy to its successful operation.

With these ends in view my invention consists, first, in the combination, with a dial, of indicating-disks secured to the dial and electro-magnets having hollow cores and perforated heads, through which rods having armatures attached to their inner ends are passed, the outer ends of the said rods being adapted to change the position of the indicators on the dial-face when the circuit is closed.

My invention further consists in the combination, with a dial and a lateral bar or ledge, of an indicating-disk secured to the dial by a pin passing through and having vertical movement in a slot in the dial, and a rod reciprocating in a hollow-core magnet, the outer end of said rod being adapted to impinge on the indicating-disk and dislodge it from its normal position on the dial-ledge.

My invention further consists in the combination, with a dial and a lateral bar or ledge, of indicating-disks secured to the dial by a pin passing through and having movement in a vertical slot in the dial, and a rod reciprocating in an electro-magnet having a hollow core and perforated heads, the inner end of said rod being provided with an armature, which, when attracted by the magnet, will throw the rod forward and cause it to dislodge an indicator resting on the ledge of the dial.

My invention further consists in an electro-magnet consisting, essentially, in the combination, with a hollow core and perforated heads, of a metallic rod having an armature attached to its inner end, said rod being adapted to reciprocate in the core and perforated heads of the magnet and impinge against and change the position of an indicator on the dial-face.

My invention further consists in an indicator-readjuster consisting, essentially, in the combination, with two upright bars adapted to have reciprocatory movement in the case-frame, and provided with ratchet-bars at their lower ends, of cross-bars connecting the two upright bars and adapted to engage with the under faces of the pins secured to the indicators, and a pinion engaging with the ratchet-bar of the frame to actuate it in vertical movement.

My invention further consists in the combination, with a dial having lateral bars secured to its outer face, of indicating-disks secured to the dial by pins passing through the dial and having vertical movement in slots therein, and a vertically-movable frame, the cross-bars of which are adapted, when raised, to engage with the under faces of the pins, and through them restore the indicators to their normal position on the dial-face.

My invention further consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, in front elevation, of an annunciator or visual indicator constructed in accordance with my invention. Fig. 2 is a view in rear

elevation thereof. Fig. 3 is a view in vertical cross-section, and Fig. 4 is a detached view of an indicator.

Let A represent a case, in which the parts of the annunciator are inclosed, and which is located in suitable position and in electric connection with all desired points, as with windows and doors if used as a burglar-alarm indicator, or with the different halls and apartments of a house if used as a call-indicator.

B represents a dial or face plate, on which the evidence of the closing of different circuits is exhibited by a number of indicators, C, on each of which is indicated, either by name or by an arbitrarily-selected symbol, the point with which it is in electric connection. Said indicators are provided at points near their peripheries and at right angles to their faces with pins D, which pass through and have reciprocating movement in vertical slots *a* in the dial, said slots being of such length that when any one of the pins D is in its highest adjustment the lower edge of the indicator, which it supports on the dial B, will just cover an aperture, *b*, located under the slot in which the pin has movement. A thin strip or ledge of metal, B^2, crossing the dial laterally and attached thereto, is situated directly under the apertures *b*, and it should not exceed in thickness the thickness of the indicators C, which are supported on it in their normal position. A series of electro-magnets, A′, in circuit-connection with different points in a house, are supported in any desirable manner back of the dial B. In the drawings they are represented as supported between two lateral beams, B′. Another pair of magnets adapted to operate the two indicators of the lower row on the dial are not represented in the drawings, as they would obscure the device by means of which the indicators are raised to their normal positions after having been thrown down by the closing of any circuit. All that it is necessary to say of them is, that they are operated in precisely the same manner as those of the upper row. The coils of the magnets A′ are wound on a hollow core, a^2, and the heads b^2 b^3 of the magnets are centrally perforated, as at c^2. The magnets are now set in such relative adjustment with relation to the dial B that the core a^2, the perforations c^2 of the heads b^2 b^3, and the apertures *b* in the dial-plate will all register, and will admit a rod, d^2, to the inner end of which an armature, A^2, is attached. When the circuit is broken the rods d^2 will either register with the apertures *b* in the dial-plate or project slightly thereinto. When, now, the circuit is closed in any of the magnets and they are energized, the armature A^2 will be attracted to the head b^3, and the inner end of the rod d^2 will be pressed through the dial-plate and impinge against the inner face of the indicator representing the point at which the connection was closed and dislodge it from the lateral ledge B^2, on which it was normally supported. The indicator so acted on will now fall out of line with the other indicators in the same row, and the point at which the circuit has been closed can be readily detected.

If desired, an automatically-operated bell may be arranged to sound simultaneously with the dropping of the indicator, thereby combining an alarm with a visual indicator.

The next thing to be accomplished is the restoration of the indicator to its original position on the ledge B^2. This is done by means of a frame consisting in two upright bars, E E, joined by cross-rods *e e′*, which are located in such position that they will engage with the under face of the pins D and through them raise the indicators. The pins D, as before described, are attached to the upper edges of the indicators C, and hence will act as levers and tend to throw their inner ends in toward the dial-plate, the result of which will be that the indicators will engage, by virtue of this tendency, with the upper face of the ledge and be retained thereon. The lifting-frame, the action of which has just been described, is actuated in its upward movement by a ratchet device consisting of a toothed plate, E′, attached to one of the upright bars E, the teeth of said plate engaging with a pinion, E^2, on a pinion-shaft, B^4, actuated by a crank, C^2, located on the outside of the annunciator-case. When it is desired to raise the indicators C to their normal resting-place on the ledge B^2, the ratchet-frame is raised through the said crank C^2, the cross-bars *e* engaging with the pins D, which operate, as before described, to replace the indicators. By letting go of the crank the frame will now fall of its own gravity in such position that the pins are free to fall the length of the vertical slots *a*, and the frame will be ready to be operated on to replace any indicators that may be dislodged by the closing of a circuit.

It is apparent that a dial may be provided with any number of indicators, and that any number of magnets may be provided to operate them. Again, I may, if desired, hinge the indicators to the front face of the dial, and, instead of restoring them to a position to be again acted upon by a lifting-frame, I may do so by hand or by other devices exterior to the dial-plate. Again, the dial-plate may be of transparent or of translucent material and be adapted to be illuminated, that it may be read at night; or, if opaque, the dial or the indicators may be rendered luminous by the application to their outer faces of any of the luminous paints now in use.

I can also conceive that my improved cut-off, described in Letters Patent No. 189,993, and granted to me April 24, 1877, may be employed to great advantage in connection with the herein-described improvement in annunciators, for by means of the said cut-off device different connections with the annunciator may, as desired, be cut out of circuit, leaving the rest unaffected.

I would, then, have it understood that I do not limit myself to the exact construction and arrangement of parts shown and described, but

hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. In an electric annunciator, the combination, with a dial, of indicating-disks secured to the dial, and electro-magnets having hollow cores and perforated heads, through which rods having armatures attached to their inner ends are passed, the outer ends of the said rods being adapted to change the position of the indicators on the dial-face when the circuit is closed, substantially as set forth.

2. In an electric annunciator, the combination, with a dial and a lateral bar or ledge, of an indicating-disk secured to the dial by a pin passing through and having vertical movement in a slot in the dial, and a rod reciprocating in a hollow-core magnet, the outer end of said rod being adapted to impinge on the indicating-disk and dislodge it from its normal position on the dial-ledge, substantially as set forth.

3. In an electric annunciator, the combination, with a dial, a lateral bar, indicating-disks secured to the dial and adapted to have vertical movement on the dial-face, of hollow-core magnets, and rods reciprocating in said magnets and adapted to be influenced thereby to change the position of the indicators on the dial-face, substantially as set forth.

4. In an electric annunciator, the combination, with hollow-core magnets and rods reciprocating therein, of a dial and indicators adapted to be changed in position on the dial when acted upon by the said reciprocating rods, substantially as set forth.

5. In an electric annunciator, the combination, with an electro-magnet consisting, essentially, of a hollow core, perforated heads, a rod reciprocating in the said core and heads, and an armature attached to the inner end of said rod, of a dial-plate and indicators adapted to be changed in position on the dial when acted upon by the reciprocating rods of the magnets, substantially as set forth.

6. In an electric annunciator, an indicator-readjuster consisting, essentially, in the combination, with two upright bars adapted to have reciprocatory movement in the case-frame, and provided with ratchet-bars at their lower ends, of cross-bars connecting the two upright bars and adapted to engage with the under faces of the pins secured to the indicators, and a pinion engaging with the ratchet-bar of the frame to actuate it in vertical movement, substantially as set forth.

7. In an electric annunciator, the combination, with a dial having lateral bars secured to its outer face, of indicating-disks secured to the dial by pins passing through the dial, and having vertical movement in slots therein, and a vertically-movable frame the cross-bars of which are adapted when raised to engage with the under faces of the pins, and through them restore the indicator to its normal position on the dial-face, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of December, 1880.

ADDISON BRADFORD.

Witnesses:
W. W. BLACKMAN,
J. B. DAVENPORT.