

933,756.

Patented Sept. 14, 1909.

FIG. 1.

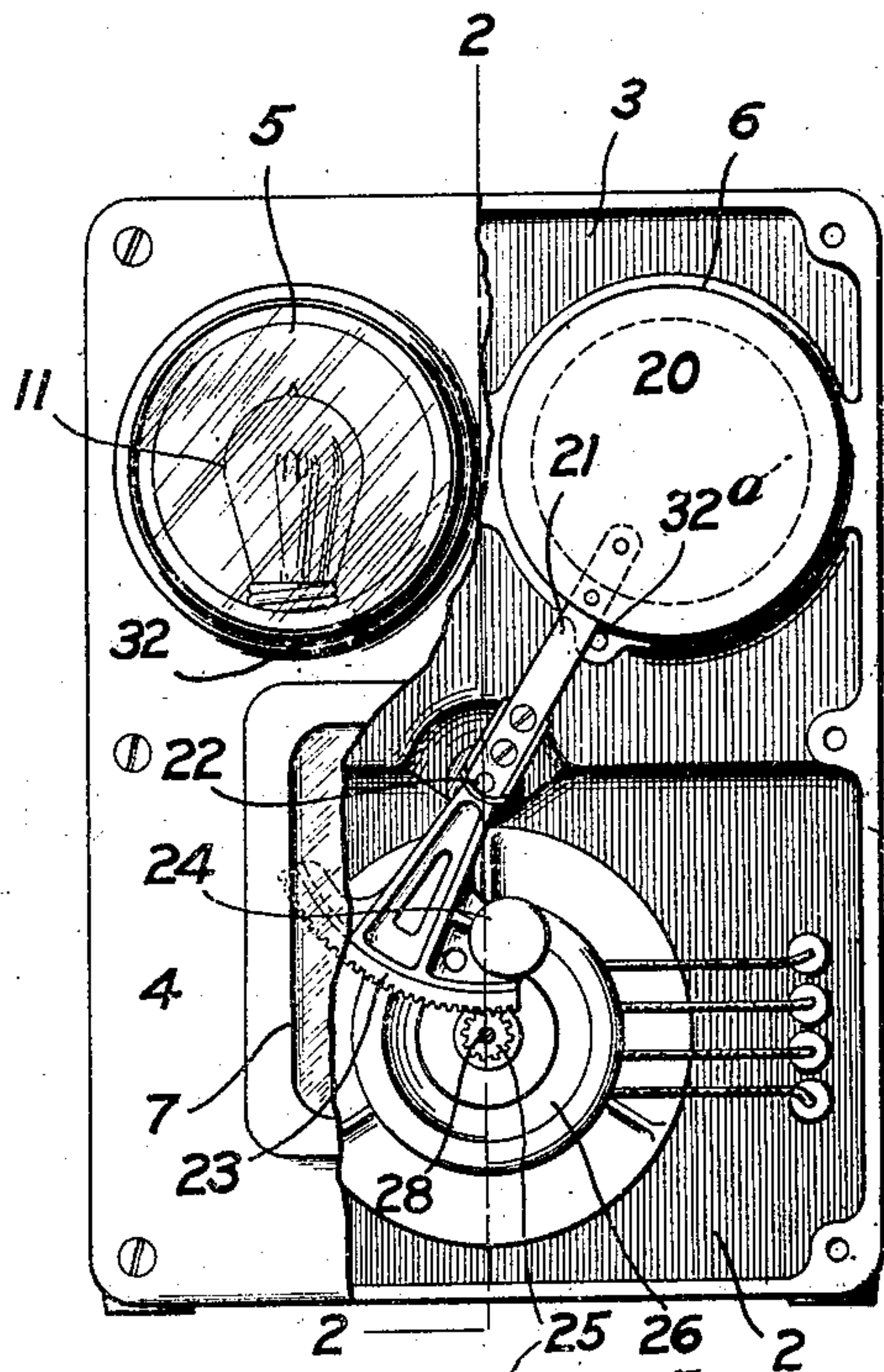


FIG. 2.

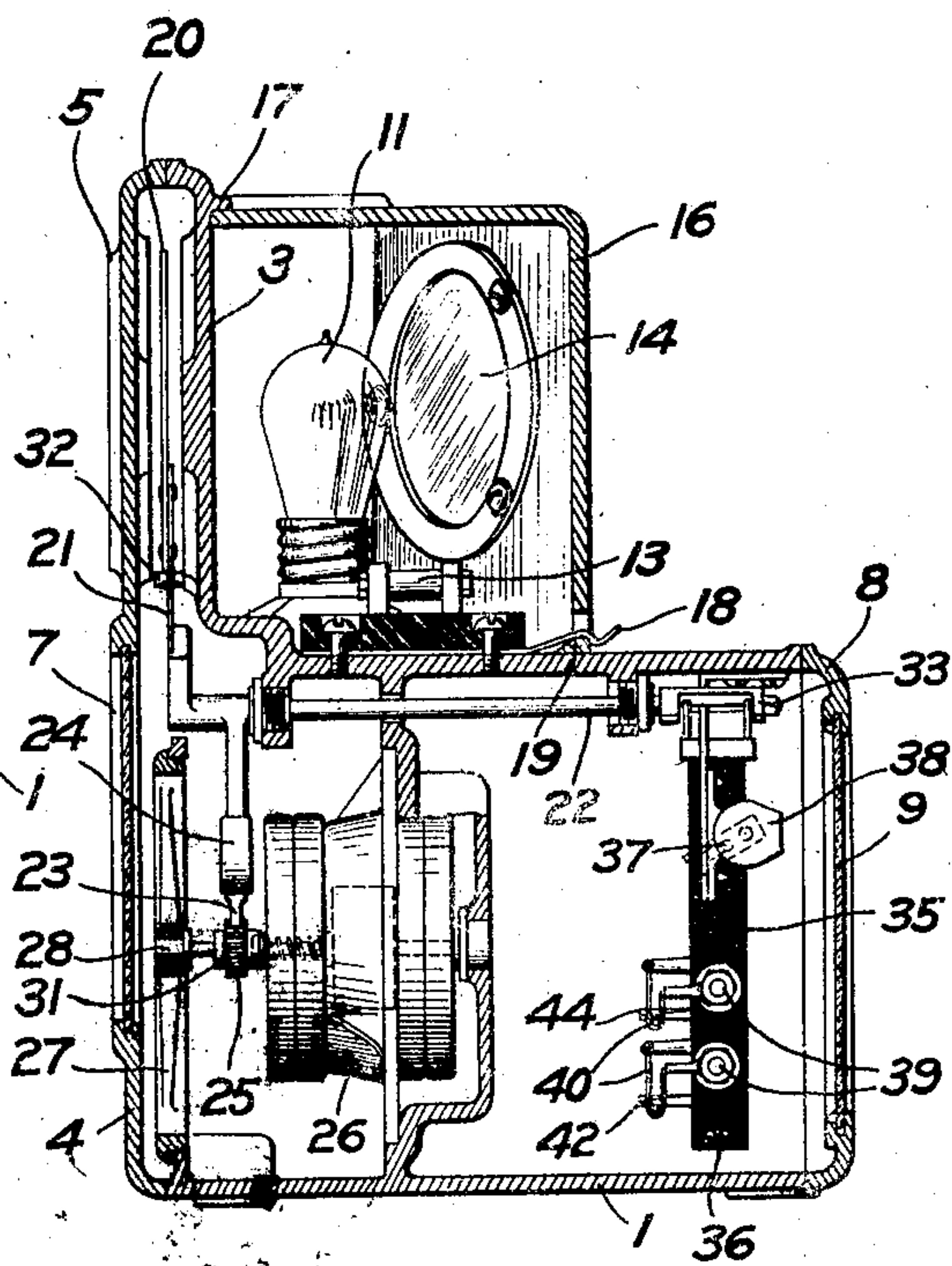


FIG. 5.

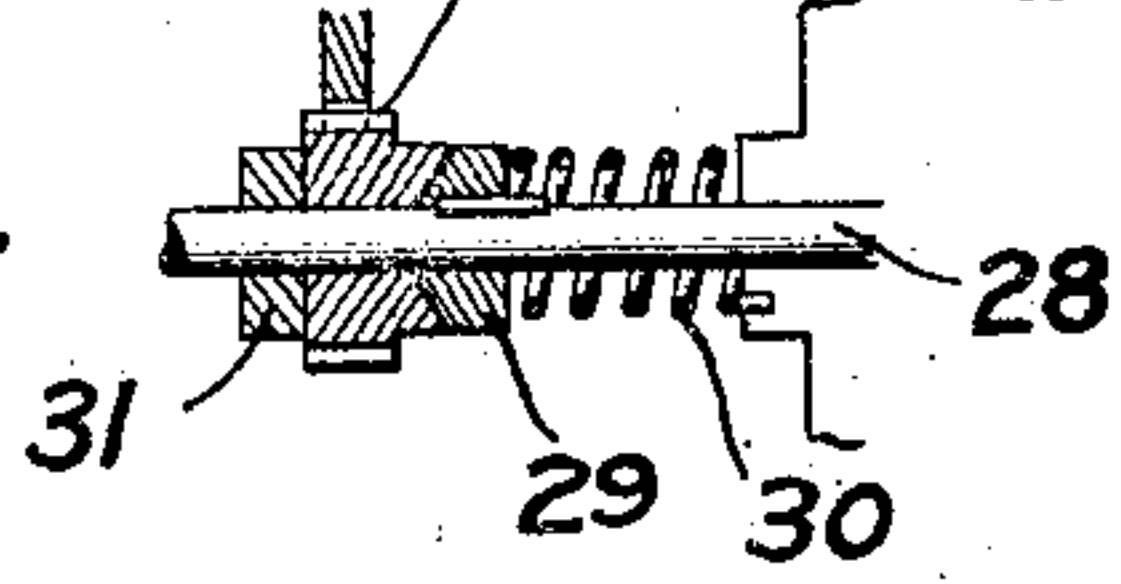


FIG. 3.

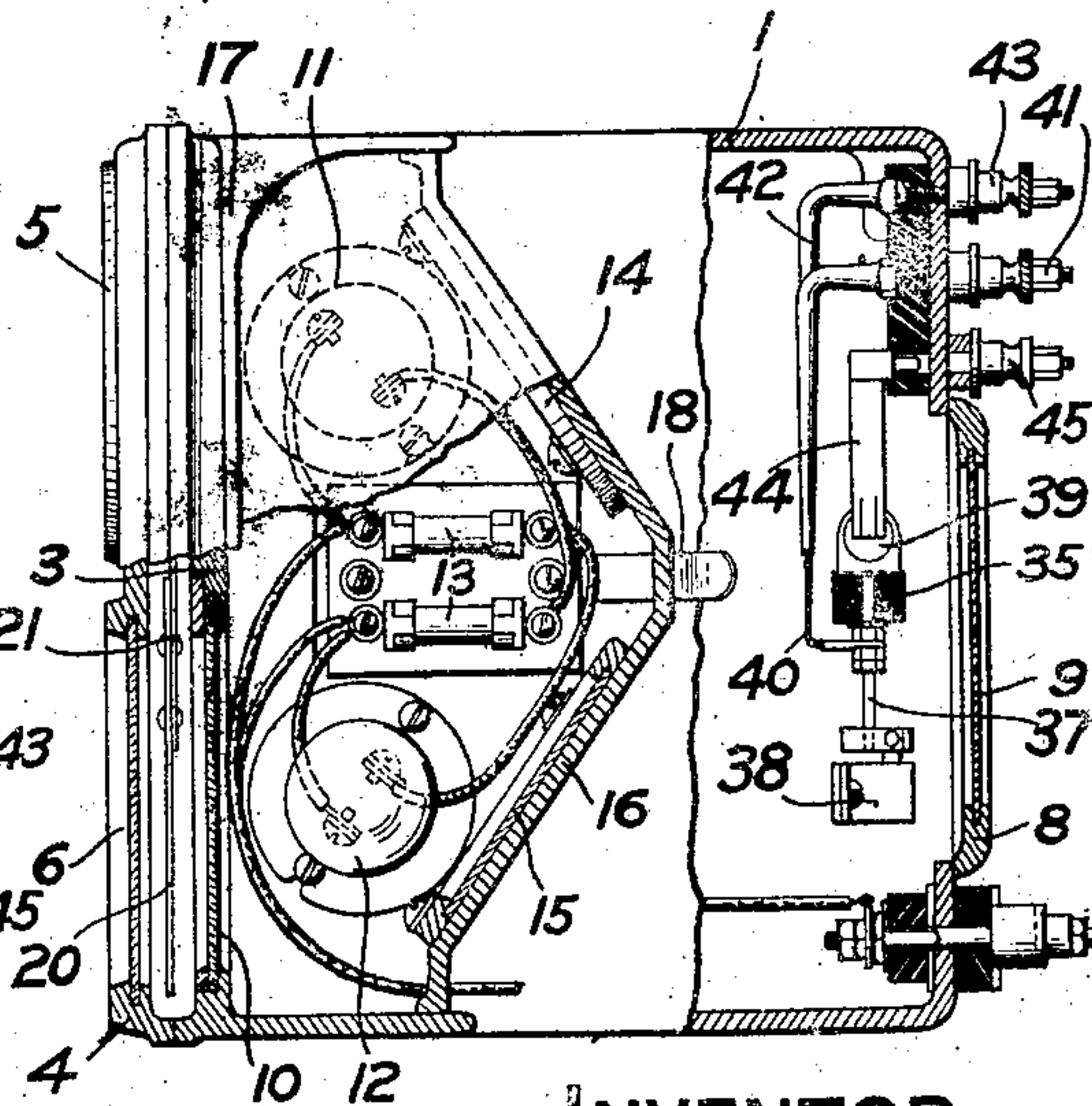
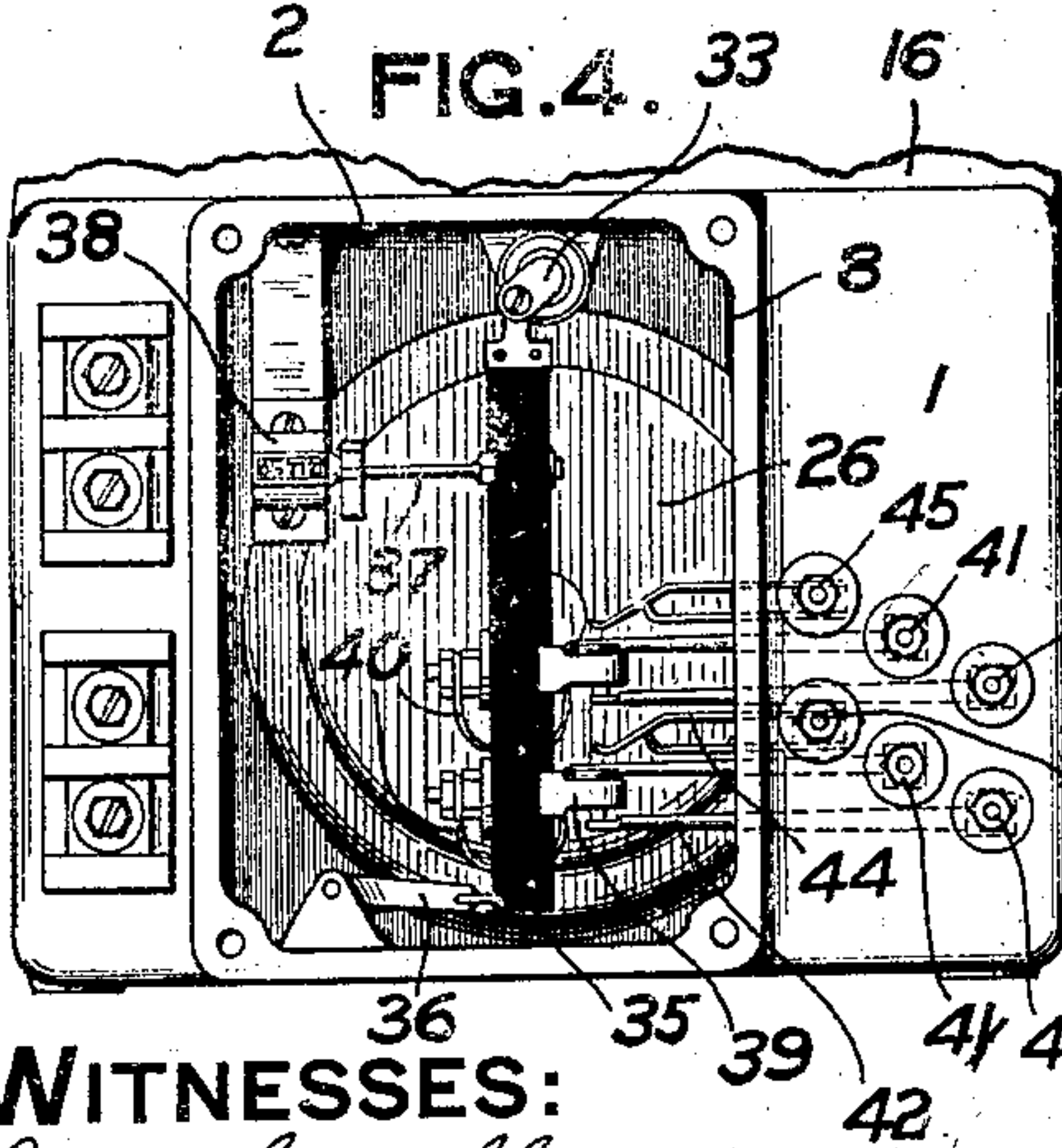


FIG. 4.



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# UNITED STATES PATENT OFFICE.

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## ELECTRIC SIGNAL.

933,756.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed March 18, 1908. Serial No. 421,945.

*To all whom it may concern:*

Be it known that I, WINTHROP K. HOWE, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Electric Signals, of which the following is a specification.

This invention relates to electric signals adapted to railway use.

It consists in the apparatus hereinafter described and claimed, and its object is to provide an efficient signal, in which when two lights are displayed therein and one light is extinguished for some cause, the effect of the use of two lights is not wholly lost.

In the drawings:—Figure 1 is a front elevation of a signal mechanism embodying this invention, part of the casing being broken away to exhibit interior construction; Fig. 2 is a vertical section on the line 2—2 of Fig. 1; Fig. 3 is a top plan view, parts of the casing being removed to exhibit interior construction; Fig. 4 is a rear elevation of the lower part of the device, the rear door being removed in order to show interior construction; Fig. 5 is a cross section through the clutch.

The casing is adapted to be made of cast iron, and is composed of a main portion 1 open at the front and back, and having the vertical web or partition 2 substantially in the middle thereof, and also the upwardly extending portion 3. A concave front plate 4 covers the upwardly extending portion 3, and also the lower chamber or part of the casing, and is provided with two glazed openings 5 and 6. A lower opening 7 in the plate 4 may be provided, if desired, and may contain a glass plate to permit the inspection of the interior without removing the front plate 4. The back plate 8 covers the rear open end of the casing 1, and may be provided with an opening and a glass plate 9, in order to permit inspection of the interior at will. The upward extension 3 of the casing 1 has glass openings registering with the openings 5 and 6. One of these openings 10 is shown in Fig. 3. There is, therefore a space inclosed in the upward extension 3 of the casing 1 between the front plate 4 and said extension, through which light may pass. Behind each of the pairs of openings is a suitable light, shown in the present case as an

incandescent electric light 11, 12. Fuses 13 are inserted in the circuits of these lamps, for protection against abnormal currents. Behind each lamp is a reflector 14, 15, disposed at an angle of about 110 degrees. These reflectors are arranged on a suitable support, which, in the present case, is a supplementary casing 16 fitting on top of the casing 1 and against the back of its upward extension 3. On the back of said upward extension 3 is a rib 17, under which the front edge of the supplementary casing 16 rests. The casing 16 may be fastened in any suitable way upon the main casing 1, but a convenient mode of fastening the same is to attach a spring catch 18 to the main casing 1, which engages a suitable part 19 of the supplementary casing 16, and holds the latter in place, but permits its easy removal for cleaning the reflectors 14 and 15, and for inspection and replacing of the lamps 11, 12.

In the shallow space between the upward extension 3 of the main casing 1 and the front plate 4 swings a plate or disk 20, which in one or the other of its accustomed positions covers the glazed aperture 5 or 6, and if the disk is opaque prevents the passage of light through the aperture, or if the disk is of colored material produces the appearance of colored light. A motor is provided for swinging the disk, and this motor is employed for simultaneously operating means for controlling electric circuits when an electric motor is employed.

The disk 20 is fastened on an arm 21 which is fixed on a suitable pivot, such as the shaft 22, and to this same shaft is attached a segmental gear 23 and a counterweight 24 adapted to throw the disk 20 normally to one particular position. In the form of device shown, the counterweight throws the disk toward the right, so as to obscure the opening 6, when no energy is acting upon the disk mechanism. A pinion 25 meshes with the segment 23, and said pinion is on the shaft of an electric motor 26, which may be conveniently attached to the partition 2 above mentioned, and may have one bearing of its armature in said partition, and the other bearing in a support 27 fastened in the casing 1. The motor shaft 28 has splined upon it one member 29 of a clutch, for driving the pinion 25. In the present instance, the member 29 is cone shaped, and is held in engagement with its mating part



by a spring 30, Fig. 5. The corresponding hollow cone mating with the cone 29 in the present case is constructed in the pinion 25, and a collar 31 on the shaft 28 prevents the pinion from moving from its proper position. When the motor 26 is energized, the pinion 25 will be revolved by the clutch, and the disk 20 will swing from the position shown in Fig. 1 to cover the aperture 5. When the disk reaches the position suited to cover the aperture, a stop 32 prevents further movement of the disk, by contact with some part of the disk or its movable support, and then, if the disk should have a tendency to rebound from the stop, the rebound will be prevented because the part 29 which is splined to the shaft 28 will slip slightly on the other clutch part, the motor is stalled as it is not strong enough to act against the clutch, and the disk will be held in the position which covers the aperture 5 against the effect of the counterweight 24. As soon as the motor 26 is deenergized, the counterweight 24 will cause the whole armature of the motor, together with the 32<sup>a</sup> prevents further return movement of the disk 20.

At a suitable point on the shaft 22 is a crank 33, Fig. 4, and this crank carries a bar 35 whose movement is guided at the lower end by a link 36, so that said bar 35 moves approximately in a straight line. This bar carries a pin 37 adapted to actuate a counter 38, whereby the number of signaling operations performed by the apparatus is registered. The bar carries also one or more contacts 39, having a flexible connection 40 with a binding screw 41 on the casing 1. This contact may be provided with a corresponding back contact 42 connected with a binding screw 43 on the casing, and also a front contact 44 connected with the binding screw 45 on the outside of the casing, so that while the motor 26 is not energized, current may flow through the flexible connection 40 and the back contact 42, and when the motor is energized current will flow through the flexible connection 40 and the front contact 44.

The operation of the device is as follows: When the motor is energized in any manner well known in railway signaling such as by a track circuit, or by the closure of a track instrument in circuit with a source of current, the motor 26 is energized, and the disk 20 swings to cover the aperture 5. This will produce a certain predetermined signaling effect, and this signal continues as long as the motor is energized. At the same time the counter 38 is actuated and registers the signaling action. Simultaneously, the back contact 42 is broken and the front contact 44 is made, so that other circuits may be made and broken as desired, and these circuits may be local circuits for the operation

of signals, &c., or may be circuits for registering or repeating at a distance the signaling action. The arrangement here shown, consisting of the motor 26 and the contact device operated thereby constitute a form of relay. The weight of the bar and the parts that it carries in the construction shown, constitutes an aid to the counterweight 24 in returning the disk 20 to its normal position of rest shown in Fig. 1. If either of the incandescent lamps 11 and 12 should burn out, or should fail in some other way (for instance lamp 11), the other lamp 12 would continue to burn, and light from the latter lamp is reflected by the reflectors 14 and 15 out through the aperture 5. In fact, the angle of the two reflectors 14 and 15 is such, with reference to the position of the lamps 11 and 12, that not only is light reflected from the backwardly directed rays, first from the adjacent reflector, then to the other reflector, and thence out through the aperture, but rays from the lamp falling directly on the aperture adjacent to the other lamp are also reflected through the aperture opposite said other lamp, so that in case either lamp is extinguished, rays from one lamp will pass through both apertures 5 and 6, although, of course, the intensity of light will be diminished.

What I claim is:—

1. In a signaling apparatus, a main casing adapted to contain a motor and having an extension therefrom; a motor in said main casing; a cover plate for covering said casing and extension, having one or more apertures for the passage of light in that portion covering said extension, and having space behind the cover for an oscillating disk extending from said motor into said extension and adapted to cover and uncover said apertures; and a support for lighting means upon said casing adjacent to said aperture or apertures.

2. In a signaling apparatus, a main casing adapted to contain a motor, and having an extension therefrom provided with one or more apertures for the passage of light; a motor in said main casing; a cover plate for said casing; an extension having apertures for the passage of light, registering with the aperture or apertures in said extension and having space between the cover and extension for an oscillating disk extending from said motor into said extension and adapted to cover and uncover said aperture or apertures; and a support for lighting means in position to project light through said aperture or apertures.

3. In a signaling apparatus, a main casing adapted to contain a motor and having an extension therefrom; a motor in said main casing; a cover plate for covering said casing and extension, having one or more apertures for the passage of light in that portion



covering said extension, and having space behind the cover for an oscillating disk extending from said motor into said extension and adapted to cover and uncover said apertures; a support for lighting means upon said casing adjacent to said aperture or apertures; and a supplementary casing removably attached to the main casing for inclosing the lighting means.

10 4. In a signaling apparatus, a main casing adapted to contain a motor, and having an extension therefrom provided with one or more apertures for the passage of light; a motor in said main casing; a cover plate for  
15 said casing; an extension having apertures for the passage of light, registering with the aperture or apertures in said extension and having space between the cover and extension for an oscillating disk extending from  
20 said motor into said extension and adapted to cover and uncover said aperture or apertures; a support for lighting means in position to project light through said aperture or apertures; and a supplementary casing  
25 removably attached to the main casing for inclosing the lighting means.

5. In a signaling apparatus, a main casing adapted to contain a motor and having an upward extension therefrom provided with  
30 two apertures for the passage of light; a cover plate for said casing; an extension having two apertures for the passage of light registering with the apertures in said upward extension and having space between  
35 the extension and cover for an oscillating disk adapted to cover and to uncover said apertures alternately; a source of light behind each aperture; and two reflectors arranged to reflect rays from each source of

light through the aperture opposite the other source of light. 40

6. In a signaling apparatus, a main casing adapted to contain a motor and having an upward extension therefrom provided with two apertures for the passage of light; a  
45 cover plate for said casing; an extension having two apertures for the passage of light registering with the apertures in said upward extension and having space between the extension and cover for an oscillating  
50 disk adapted to cover and to uncover said apertures alternately; a source of light behind each aperture; and reflecting means arranged to reflect rays from each source of light through the aperture opposite the  
55 other source of light.

7. In an electric signal, a counterbalanced pivoted arm; a segmental gear carried thereby; a pinion meshing with said segmental gear; an electric motor having a shaft passing  
60 loosely through said pinion; a friction clutch member on said shaft always engaging said pinion; and stops on the casing for limiting the movement of said arm.

8. In an electric signal, a counterbalanced  
65 pivoted arm; a segmental gear carried thereby; a pinion meshing with said segmental gear; an electric motor having a shaft passing loosely through said pinion; a friction  
70 clutch member on said shaft always engaging said pinion; stops on the casing for limiting the movement of said arm; and a registering mechanism actuated upon each movement of said arm.

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Witnesses:

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M. F. GEER.