

(No Model.)

W. P. FREEMAN.

INDICATOR FOR ELECTRIC LIGHTING SYSTEMS.

No. 287,654.

Patented Oct. 30, 1883.

FIG. 2.

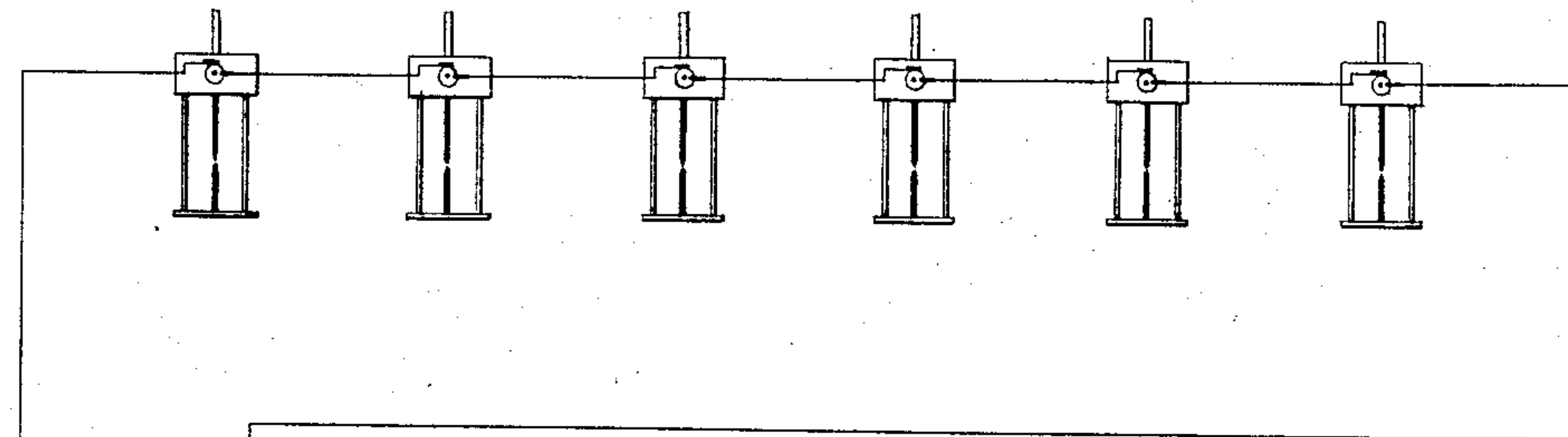


FIG. 1.

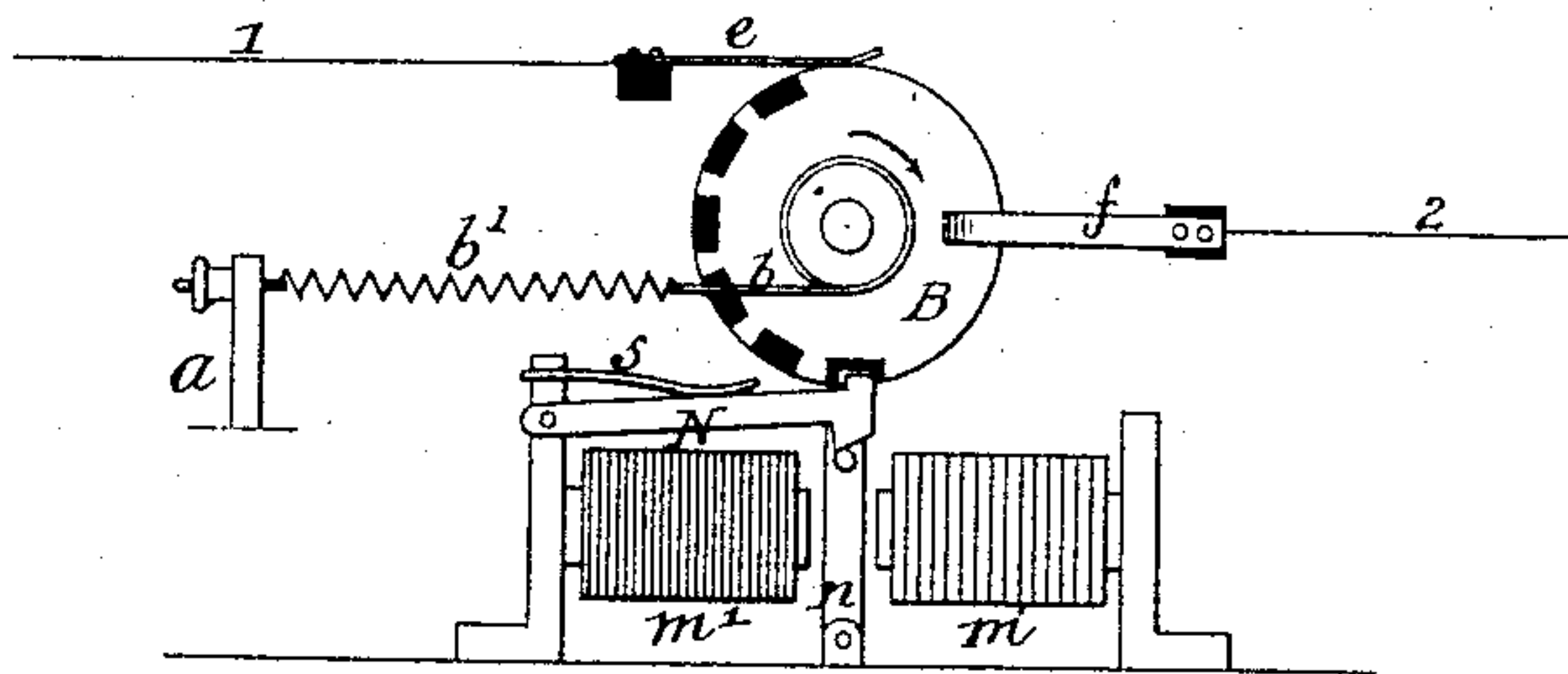


FIG. 4.

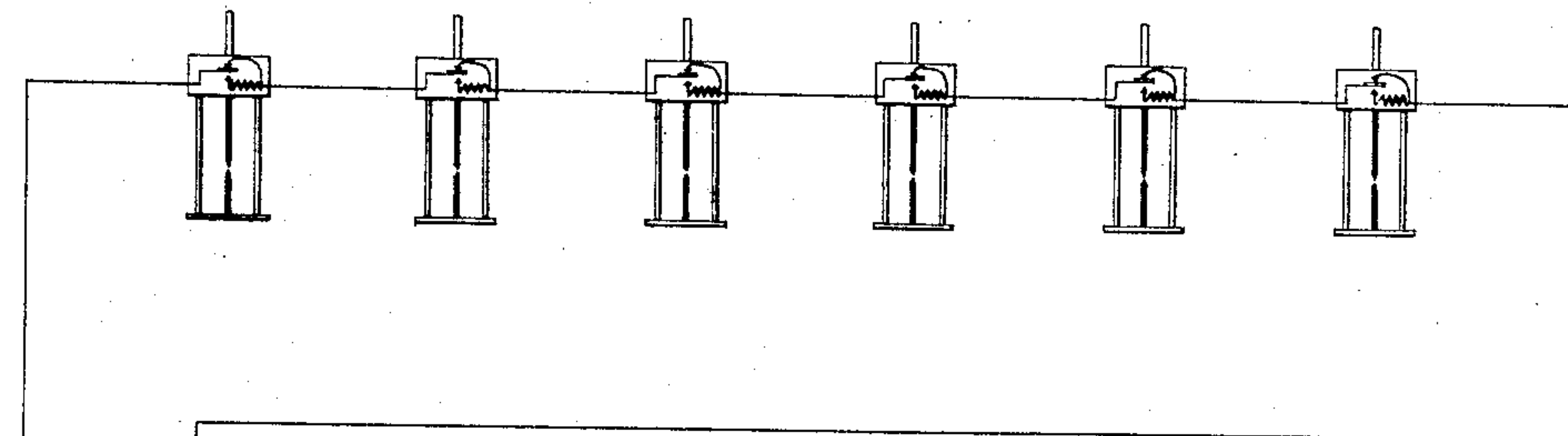
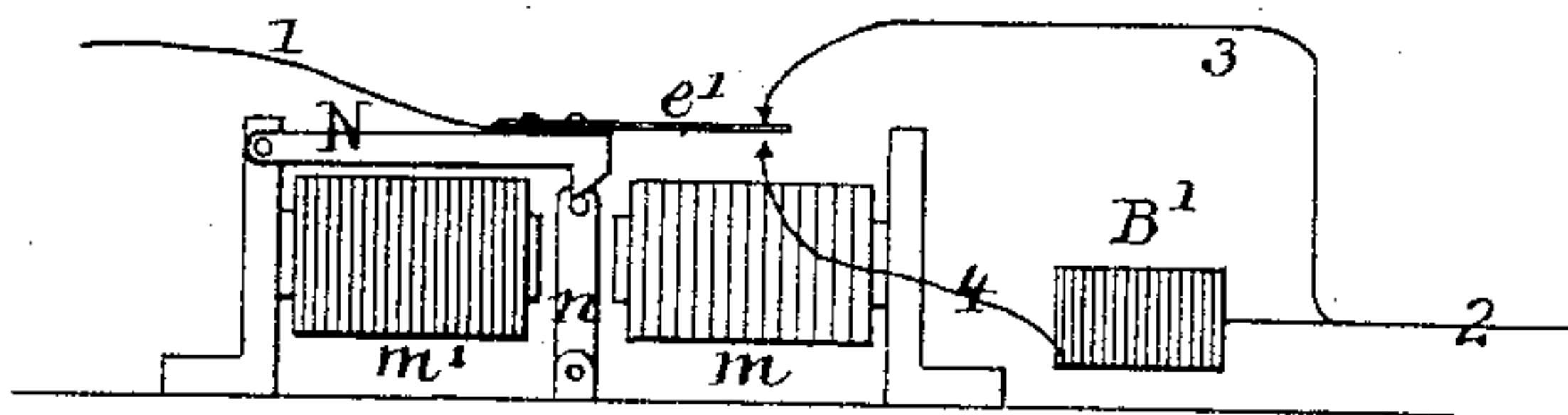


FIG. 3.



WITNESSES:

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INVENTOR:

Warren P. Freeman
by his Attorneys
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UNITED STATES PATENT OFFICE.

WARREN P. FREEMAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO WILLIAM F. JOBBINS, OF SAME PLACE.

INDICATOR FOR ELECTRIC LIGHTING SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 287,654, dated October 30, 1883.

Application filed March 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, WARREN P. FREEMAN, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented certain Improvements in Indicators for Electric Lighting Systems, of which the following is a specification.

The object of my invention is to provide an electric lighting system with an indicating-circuit, whereby the extinction of any lamp and its location in the system will be automatically indicated at the central station; and this object I attain by combining with the cut-out devices of the electric lamps a signaling-circuit which is put into operation by the movement of the cut-out in throwing the lamp out of the lighting-circuit, as hereinafter more fully described.

In the accompanying drawings, Figure 1 is a diagram illustrating the manner in which a signaling device may be combined with the cut-out of a lamp; Fig. 2, a diagram of a series of lamps with the signaling-circuit and the indicator at the station; and Figs. 3 and 4, corresponding diagrams of a modified form of indicating device.

In Figs. 1 and 3 I have shown the signaling devices as combined with the automatic cut-out shown and described in my application for a patent filed March 9, 1883, Serial No. 87,620; but it will be understood that they may be combined with various forms of cut-outs and lamps.

In the diagram, Fig. 1, m and m' are the opposed fine and coarse wire coils of the cut-out in the shunt-circuit and main lighting-circuit of the lamp, and n is the intermediate armature, with a pin, n' , on which rests the outer end of the catch-lever N , pivoted to the support for the magnet m' , and in this instance acted on by a spring, s . On the outer end of this lever is formed an upward projection, which, when the lever is maintained in its elevated position, takes into a notch of a circuit-breaking wheel, B , similar to those used in district telegraph systems. On the periphery of the wheel bears the insulated contact-spring e , connected by the conductor 1 with the next lamp, and so on to the battery L and indicator R at the station. On the face of the wheel

bears another insulated contact, f , connected by the conductor 2 with the next lamp on the other side, and so on back to the indicator and battery. As a means for operating this wheel when released by the depression of the catch-lever N , a rubber band or a cord, b , may be coiled around a hub on the wheel and provided with a spiral spring, b' , connected to a post, a , on the frame.

The breaker-wheel B of each lamp is provided with different numbers or lengths of insulating-pieces or circuit-breaking spaces from that of each of the other lamps; or each group of lamps may have circuit-breakers of a different character from those in the other groups connected with the station on the same signaling-circuit, which includes the battery L and the indicator R , Fig. 2, the latter consisting of a telegraphic sounder or call-bell or equivalent indicator. When a lamp becomes extinguished and automatically cut out of the lighting-circuit by the attraction of the armature n by the shunt-coil m' and the fall of the lever N , the circuit-breaking wheel B will be released and caused to turn by the spring b' , so that the contact e , in passing over the insulating-spaces, will break the circuit a certain number of times. The indicator R makes a corresponding signal, and thus indicates at the central station the lamp or group of lamps where the trouble exists.

Instead of using circuit-breaking wheels as indicators on the lamps, I may make use of other devices—as, for instance, I may so construct the device that the fall of the lever N on the cutting out of the lamp will throw a resistance-coil into the circuit and indicate this resistance on a galvanometer at the station, coils of different resistances being used on different lamps or groups of lamps, as indicated in the diagrams, Figs. 3 and 4. In this case the lever N is provided with an insulated contact-finger, e' , connected by the conductor 1 with the next lamp, and, as before, to the battery L and indicator R' , which in this case is a galvanometer. When the lever N is in its raised position, this finger e' is in contact with a point on the conductor 3, leading to the conductor 2 to the next lamp, as before. When the lever N falls, the finger e' comes into contact

with a point on the conductor 4, also connect-
ed with the conductor 2, and having a resist-
ance-coil, B', so that this throwing of the re-
sistance-coil into the signaling-circuit will
5 cause a corresponding indication at the gal-
vanometer R' by the deflection of its needle.
By providing the lamps or groups of lamps
with coils B' of different resistances—three
ohms, five ohms, seven ohms, &c.—the corre-
10 sponding deflection of the needle will indicate
the location of the lamp which has been cut
out of the lighting-circuit, as in the arrange-
ment before described.

I claim as my invention—

15 1. The combination of a series of electric
lamps having cut-outs for the lighting-circuit,
with a signaling-circuit having an indicator
at the station, and a different signaling de-
vice, substantially as described, on each lamp

or group of lamps, said signal being adapted 20
to be put in operation by the movement of the
cut-out to throw the lamp out of the lighting-
circuit.

2. The combination of a series of electric
lamps having cut-outs for the lighting-circuit, 25
with a signaling-circuit having an indicator,
R, at the station, and circuit-breakers on the
lamps, the circuit-breaker of each lamp being
adapted to be put in operation by the move-
ment of the cut-out to throw the lamp out of 30
the lighting-circuit, substantially as set forth.

In testimony whereof I have signed my name
to this specification in the presence of two sub-
scribing witnesses.

WARREN P. FREEMAN.

Witnesses:

E. FORMAN,
HUBERT HOWSON.