O. D. PLUMMER, G. H. HAUSSER & E. A. WARNER.

ELECTRIC SIGNALING MECHANISM.

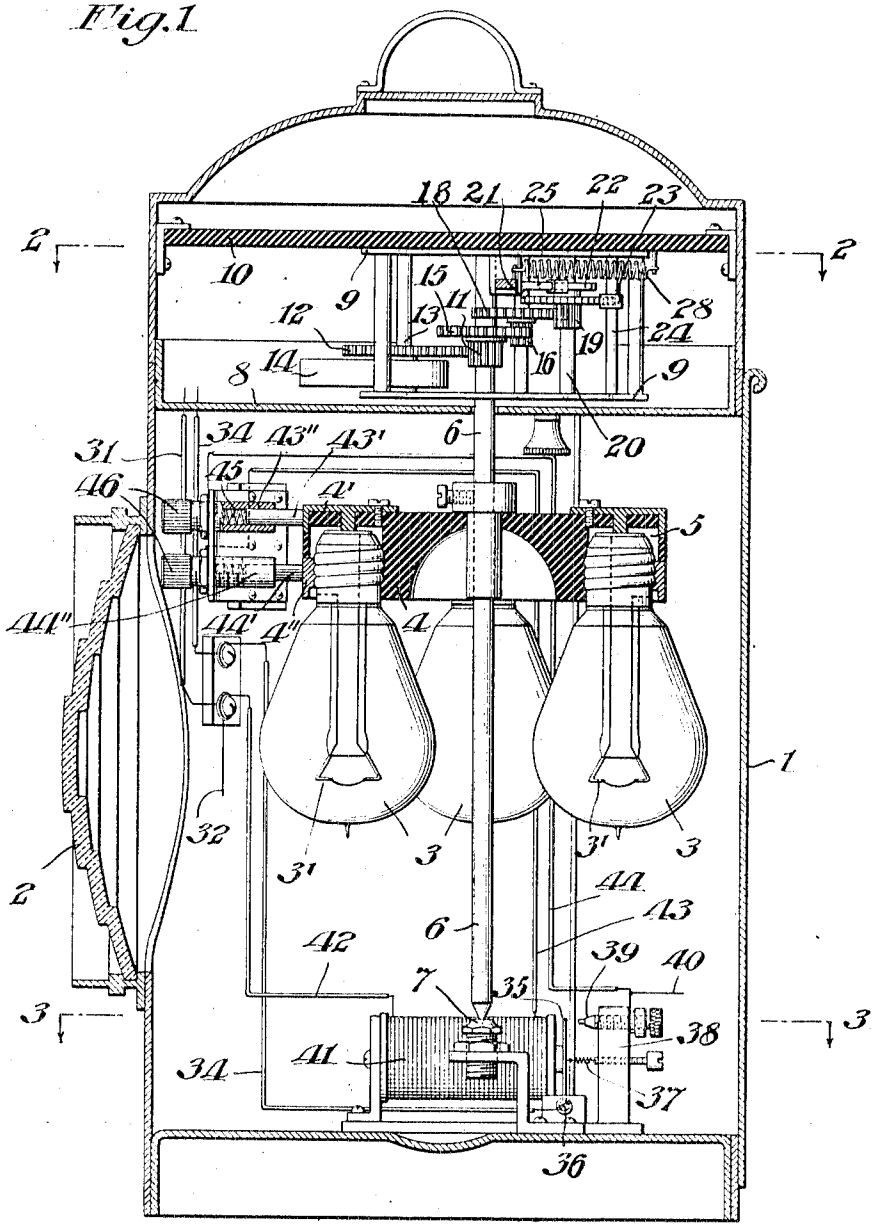
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1,105,829.

Patented Aug. 4, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS-SHEET 2.

Fig. 2.

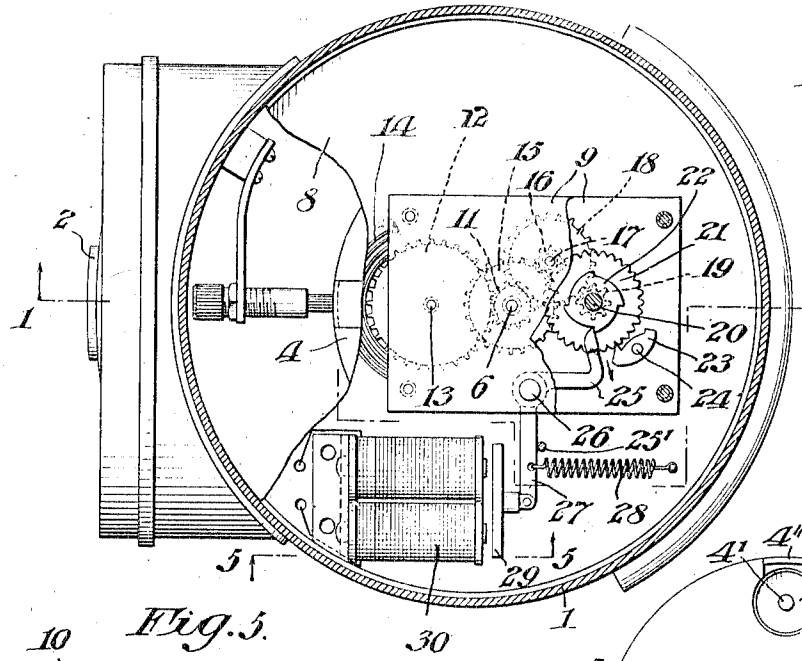


Fig. 3.

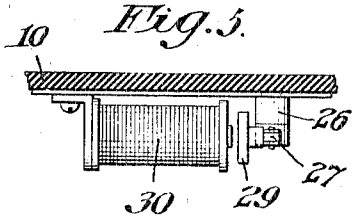
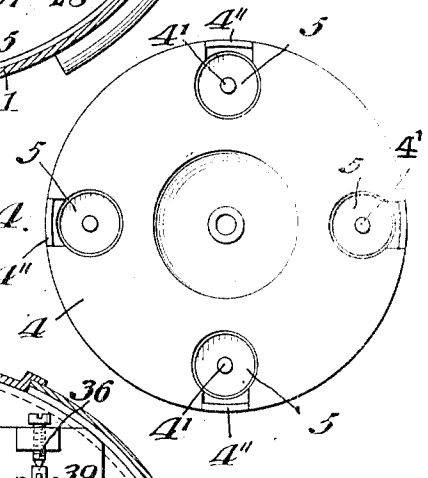
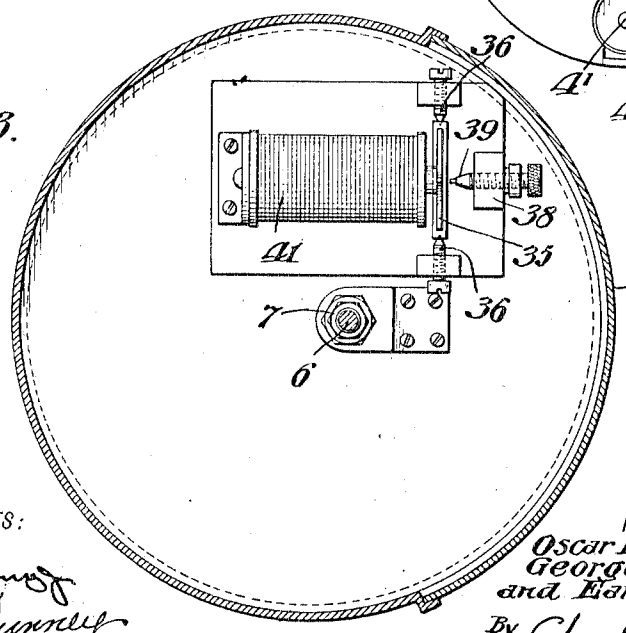


Fig. 4.





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3 SHEETS—SHEET 3.

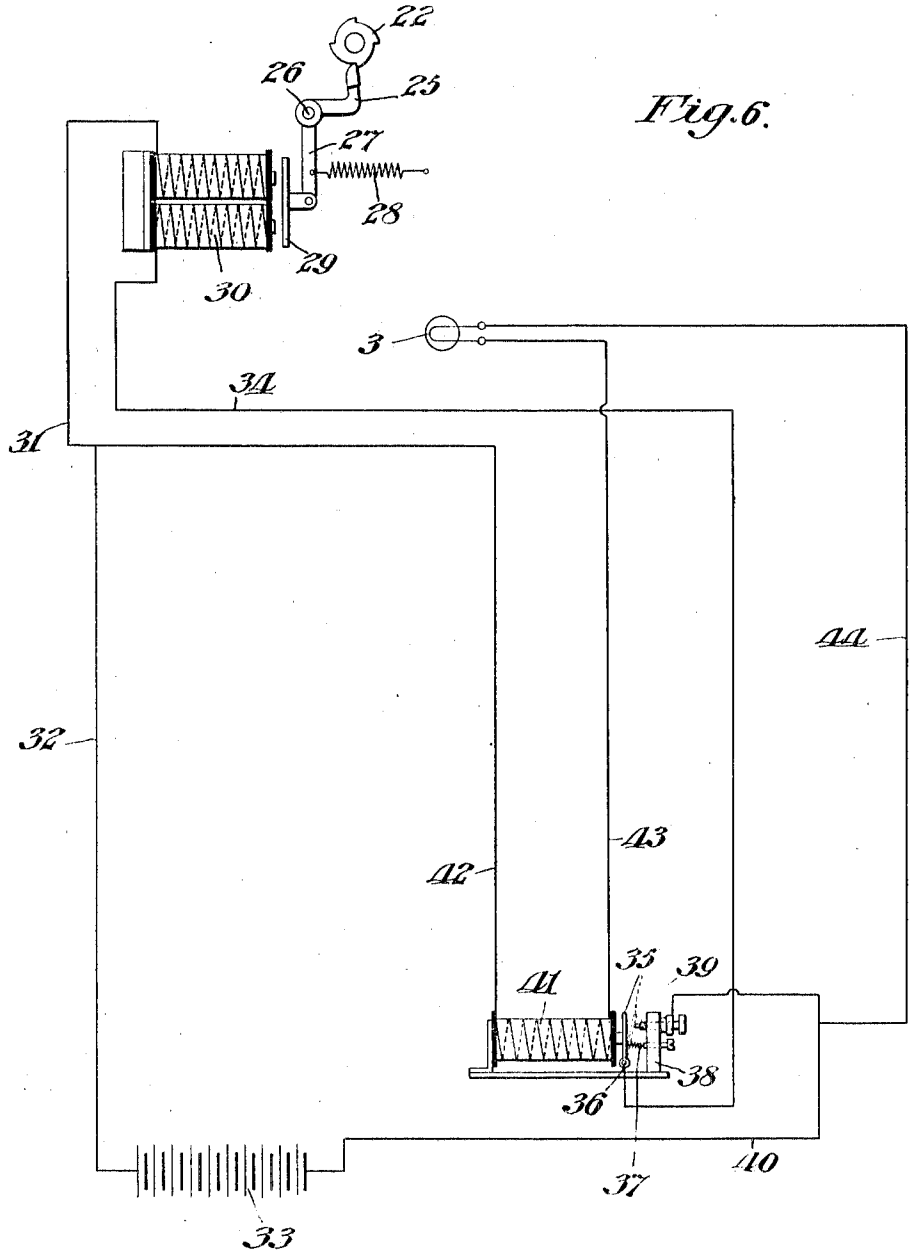


Fig. 6.

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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGNALING MECHANISM.

1,105,829. Specification of Letters Patent. Patented Aug. 4, 1914.

Application filed April 24, 1913. Serial No. 763,188.

To all whom it may concern:

Be it known that we, OSCAR D. PLUMMER, GEORGE H. HAUSSER, and EARL A. WARNER, residents of Altoona, in the county of Blair and State of Pennsylvania, have jointly invented certain Improvements in Electric Signaling Mechanism, of which the following is a specification.

This invention is an electric signaling mechanism having as its primary object the maintenance of a signal light by automatically replacing broken or inoperative lamps.

A serious defect in electric signal lights is due to the fact that the life of a lamp is very uncertain, primarily because of the irregular burning out or breaking of the filaments which is liable to take place at any time, requiring onerous inspection and involving liability to serious accident.

Our improvements eliminate this defect by mechanism comprising, in its preferred form, a lamp circuit containing an electro-magnet, a battery of incandescent lamps having a carrier adapted for placing them successively in said circuit, a motor for operating said carrier, an automatically acting stop mechanism for holding said motor in static condition normally, a relay circuit containing an electro-magnet adapted for disengaging said stop mechanism to release said motor, and a switch automatically acting to close the circuit, the switch comprising an armature attracted by the first named electro-magnet to break the relay circuit and permit the engagement of the mechanism for stopping the motor when a sound lamp has been inserted in and closed the lamp circuit.

While these improvements are especially applicable to use in signaling, it will be understood that they are also applicable where it is desired to maintain a light or substitute a sound for a broken conductor.

In the accompanying drawings, Figure 1 is a vertical sectional view of a signal lantern constructed in accordance with our invention, the section being taken on the line 1—1 of Fig. 2; Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a bottom view of the lamp carrier; Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2; and Fig. 6 is a diagrammatic view representing the circuits.

The device comprises the lantern 1 provided with a lens 2. Incandescent lamps 3 are revolubly mounted within the lantern so that they can be moved successively into position directly behind the lens by a carrier 4 having sockets 5 into which the lamps are screwed and a revoluble shaft 6 on which the carrier is fixed. This shaft, supported by the adjustable step bearing 7, passes through the diaphragm 8 fixed in the lantern above the carrier and is journaled in the motor frame 9 which is supported by the insulating plate 10 fixed in the lantern above the diaphragm. A pinion 11 is fixed on the shaft 6 and engages the spur wheel 12 on the arbor 13 which is carried by the motor frame, the wheel 12 being revoluble by a spring 14. A spur wheel 15 is fixed on the shaft 6 and meshes with a pinion 16 fixed on an arbor 17 carried by the frame 9, the arbor having a spur wheel 18 fixed thereon. A pinion 19, meshing with the wheel 18, is fixed on the arbor 20 carried by the motor frame, this arbor having fixed thereon the scape-wheel 21 and the ratchet wheel 22. A pallet 23, adapted to rock on the bearing 24 of the motor frame, coacts with the wheel 21, and a pawl 25, adapted to rock on the bearing 26 of the motor frame, coacts with the wheel 22, the pawl being provided with an arm 27 connected by a coiled spring 28 with the motor frame. An armature 29 is connected to the arm 27 and adapted to be attracted by an electro-magnet 30 which is connected by the conductors 31 and 32 with a source of electric energy, as the battery 33, and by the conductor 34 with the contact and armature 35 having the fulcrum 36. The part 35 is adapted to be drawn, by a spring 37 connecting it with the post 38, into engagement with a contact 39 which is carried by the post and connected by the conductor 40 with the battery 33. An electro-magnet 41 is adapted to attract the part

35 and withdraw it from engagement with the contact 39, this electro-magnet being connected by the conductor 42 with the conductor 32 and by the conductors 43 and 44 through a lamp 3 with the conductor 40.

Each of the lamps 3, when screwed into its socket 5, has the terminals of its filament 3′ in electrical connection with the respective metal terminals 4′ and 4″ carried at the periphery and insulated from each other by the non-conducting body of the carrier 4.

Brushes 43′ and 44′, suitably of carbon, bear against the periphery of the carrier 4 and are adapted to engage the respective terminals 4′ and 4″, the brushes being carried by the holders 43″ and 44″ and pressed into contact by springs 45, and the holders being connected with the respective conductors 43 and 44 by the binding screws 46.

When a lamp 3 connects the conductors 43 and 44, current from the battery 33 flows through the lamp circuit comprising the conductors 32, 42, 41, 43, 44″, 44′, 4″, 3′, 4′, 43′, 43″, 44 and 40. The electro-magnet 41 of the relay is thereby excited and the relay armature 35 is drawn from the contact 39, thereby breaking the relay circuit comprising the conductors 31 and 34 and the electro-magnet 30, which is de-energized. As the electro-magnet 30 is de-energized, the armature 29 is drawn back by the action of the spring 28 on the arm 27, which is stopped by the stud 25′, and the pawl 25 is held in engagement with the ratchet wheel 22, whereby the motor and carrier mechanism are held stationary. When, however, the lamp 3 in circuit is broken so that it fails to electrically connect the brushes 43′ and 44′, the electro-magnet 41 is deënergized and the armature 35 is caused to engage the contact 39, thus closing the relay circuit and causing the electro-magnet 30 to attract its armature 29. The movement of this armature toward its electro-magnet causes the crank arm 27 to draw the pawl 25 back from the ratchet wheel 22, whereby the motor is released. The spring 14 now acts through the gear wheels 12 and 11 to revolve the shaft 6 and the carrier 4 until a second lamp closes the lamp circuit, the movement being governed by the escapement mechanism comprising the parts 15, 16, 18, 19, 21 and 23. The lamp circuit being now closed, the relay circuit is broken thereby and the pawl 25 is automatically thrown into engagement with the wheel 22, thus stopping the motor and carrier mechanism to maintain the lamp circuit closed.

Having described our invention, we claim:

1. In an electric signaling mechanism, a plurality of lamps, lamp carrying mechanism, a circuit having an electro-magnet therein, motor mechanism for operating said carrying mechanism whereby said lamps are movable in succession into said circuit, a second circuit having an electro-magnet therein, means whereby said first named electro-magnet controls said second named circuit, and means whereby said second named electro-magnet controls said motor mechanism.

2. In an electric signaling mechanism, a circuit containing an electro-magnet and a pair of contacts, a revoluble carrier having contacts adapted for engaging said contacts first named, a lamp engaged to said carrier in circuit with said second named contacts, motor mechanism for revolving said carrier, stop mechanism for holding said motor, and a circuit having make and break means operated by the action of said electro-magnet, said circuit last named having therein an electro-magnet for controlling said stop mechanism.

3. In an electric signaling mechanism, a circuit containing contacts and an electro-magnet, a revoluble carrier having contacts adapted for engaging said contacts first named, lamps engaged to said carrier in circuit with the contacts thereof, a second circuit containing an electro-magnet and an armature adapted to be attracted by said first named electro-magnet to open said second circuit, motor mechanism for revolving said carrier, stop mechanism for holding said motor mechanism stationary, and means operated by said second named electro-magnet for releasing said stop mechanism.

4. In an electric signaling mechanism, a journaled shaft, a lamp carrier fixed on said shaft, a circuit containing contacts and an electro-magnet, lamps connected with said carrier and adapted for placement in said circuit through said contacts, a circuit containing an electro-magnet and a contact movable by said first named electro-magnet to open said second named circuit, stop mechanism comprising a pawl and ratchet for holding said motor mechanism, and means operated by said second named electro-magnet for disengaging said pawl from said ratchet.

5. In electric signaling mechanism, a lantern containing a light aperture, a shaft journaled in said lantern, a carrier fixed to said shaft, said carrier having lamp sockets and contacts, incandescent lamps in said sockets in circuit with said contacts, a circuit containing contacts adapted for engaging with the respective contacts in circuit with the respective lamps, an electro-magnet in said circuit, a second circuit containing a movable contacting device whereby it is adapted to be closed, said electro-

magnet being adapted for moving said contacting device to open its circuit, an electro-magnet in said second circuit, a motor for revolving said shaft, stop mechanism comprising clutching means for holding said motor, and means whereby said second named electro-magnet disegages said clutching means and releases said motor.

In testimony whereof we have hereunto set our names this 22 day of April, 1913, in the presence of the subscribing witnesses.

OSCAR D. PLUMMER.
GEORGE H. HAUSSER.
EARL A. WARNER.

Witnesses:
H. M. GILL,
WILLIAM C. SHUFF.