No. 832,297. PATENTED OCT. 2, 1906.

F. B. COREY.

SAFETY DEVICE FOR ELECTRIC SIGNALS.

APPLICATION FILED JUNE 16, 1904.

Fig. 1.

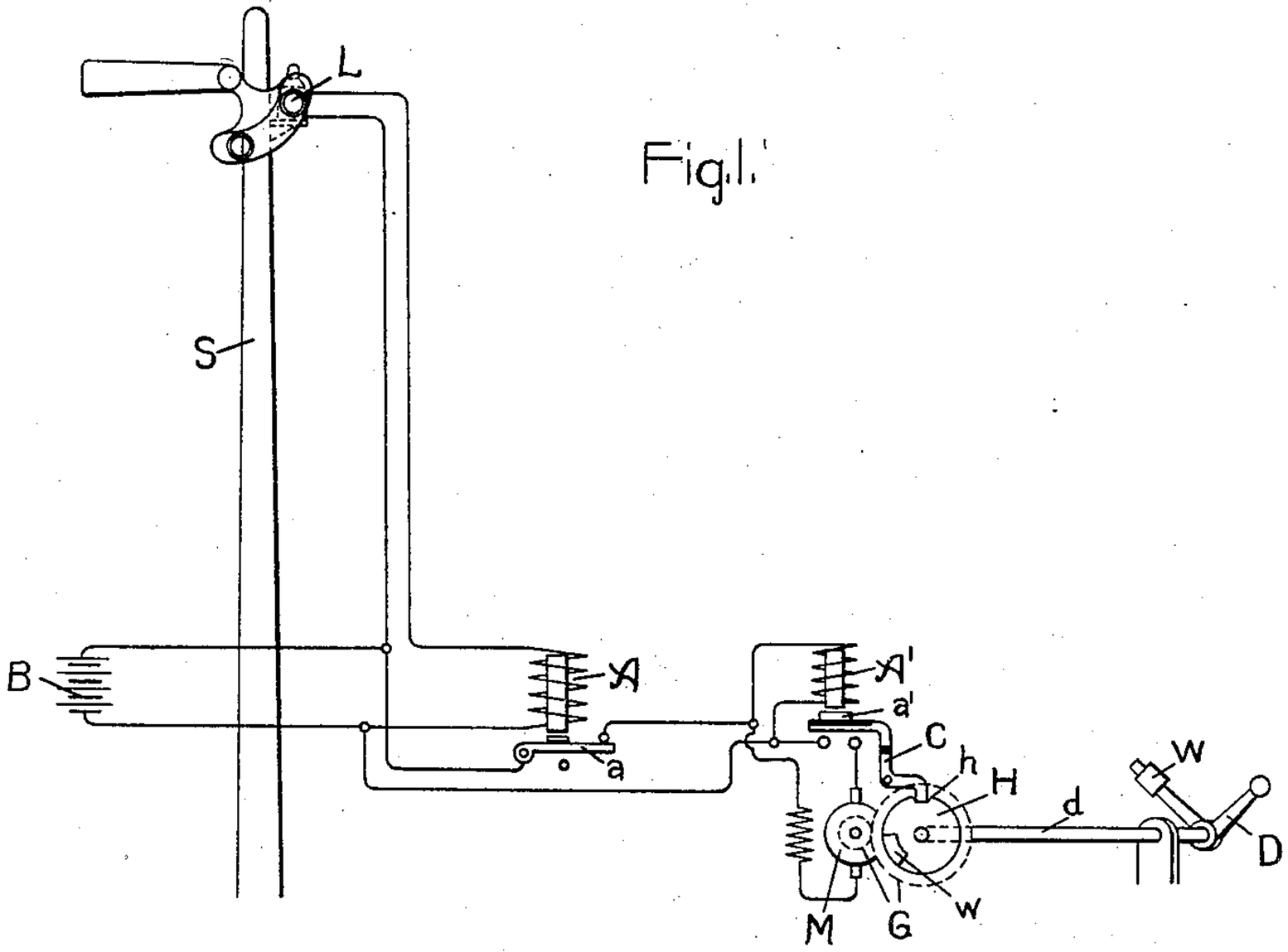
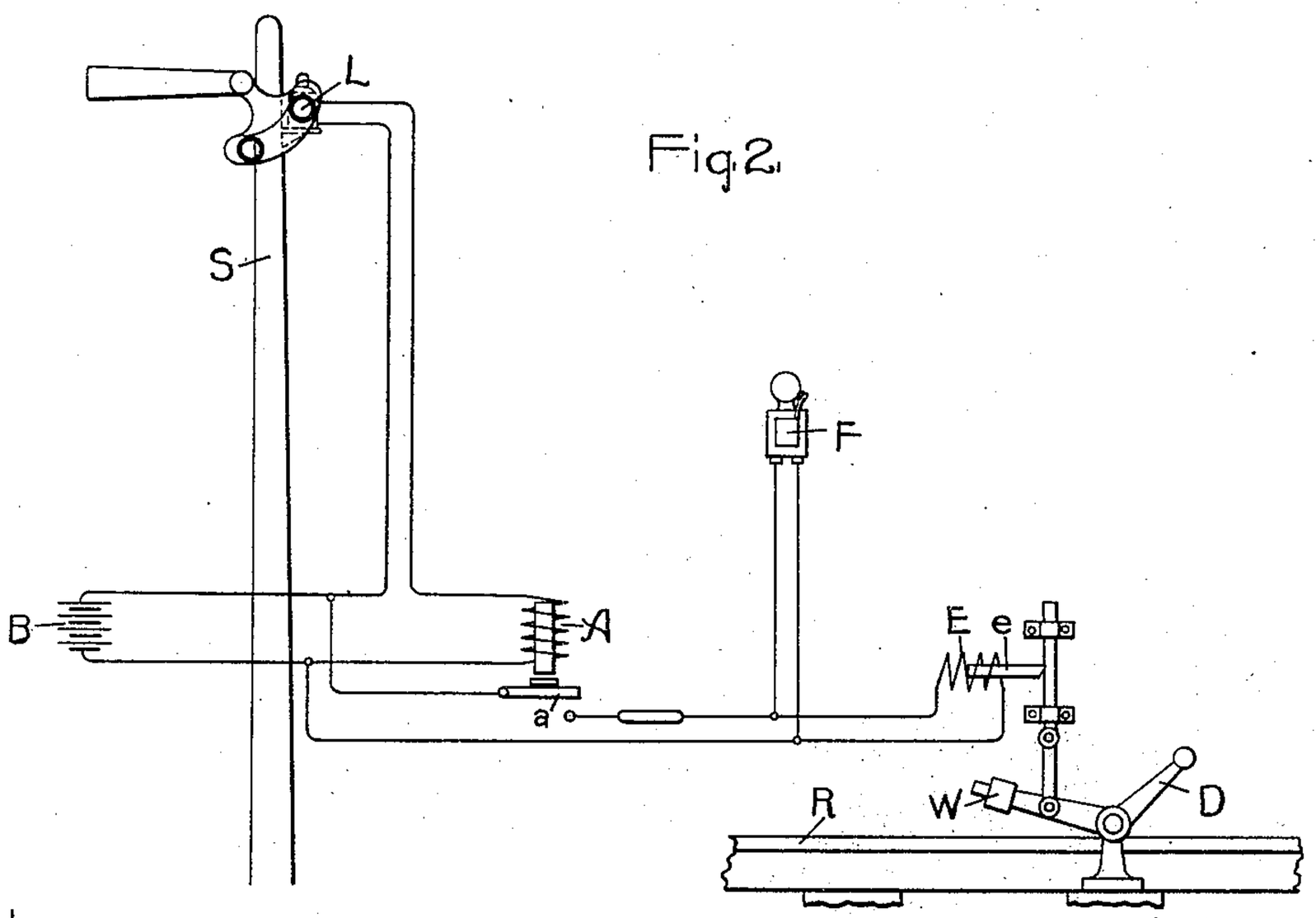


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELECTRIC SIGNALS.

No. 832,297. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed June 16, 1904. Serial No. 212,780.

To all whom it may concern:

Be it known that I, FRED B. COREY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Safety Devices for Electric Signals, of which the following is a specification.

My invention relates to signal systems, and is particularly applicable to railway block systems employing electric lights for the signals.

The object of my invention is to provide means for preventing an accident in case a lamp is accidentally extinguished from any cause. Where electricity is available, it is more convenient and economical to employ it for lighting the signal-lamp than to use gas or oil; but heretofore electricity has been used very little for block-signal systems on account of the greater liability of an accidental extinguishing of a light as compared with a gas or oil lamp.

By my invention I provide means for giving warning to a passing train if the light becomes accidentally extinguished, and thereby render the use of electricity for signal systems fully as safe as the use of gas or oil.

My invention will best be understood by reference to the accompanying drawings, in which—

Figure 1 shows diagrammatically a protective system for electric signal-lights arranged in accordance with my invention, and Fig. 2 shows a modified arrangement.

In Fig. 1, L represents an electric light mounted on the semaphore-post S and energized from a battery or other suitable source of current B. A represents a magnet-winding connected in series with the lamp L. The armature *a* of the magnet-winding controls the circuit of a second magnet-winding A′, which is connected in shunt to the source of current. The armature *a′* of this second magnet-winding is mounted on the long arm of a bell-crank lever C, the short arm of which is adapted to engage a notch *h* on a wheel or disk H. An electric motor M is geared to the disk H by the gears G and its circuit controlled by the bell-crank lever C. The disk H, which is provided with a weight *w*, tending to rotate it in a counter-clockwise direction as viewed in Fig. 1, is mounted on a shaft *d*, to which is secured an alarm device D, which may be placed beside the rail R, as shown in Fig. 2, and arranged when raised into a vertical position to engage a valve on a passing train to apply the brakes. The device D is provided with a second weight W, which assists the weight *w* in rotating the shaft *d* when the bell-crank lever C is disengaged from the slot *h*.

The operation is then as follows: The several parts are shown in Fig. 1 in their normal positions, which they occupy when the lamp L is lighted. Now if the lamp L is extinguished either by a failure of the source or by an opening of the circuit either in or outside of the lamp the magnet-winding A is deënergized and allows its armature *a* to fall. This opens the circuit of the second magnet-winding A′, which allows its armature *a′* to fall, rocking bell-crank lever C and disengaging it from the notch *h* in the disk H. The shaft *d* is consequently free to turn under the influence of the weights W and *w*, and the trip D is raised into its vertical position to give warning to a passing train. Now when the lamp is again lighted by remedying whatever defect existed the magnet-winding A is again energized and again raises its armature *a* to the position shown. The second magnet-winding A′ is consequently again energized; but it is unable to raise its armature *a′*, since the short arm of the bell-crank lever C is not opposite the notch *h*, but is held pressed upward by the periphery of the disk H. The long arm of the bell-crank lever closes the circuit of the motor M, so that when armature *a* is moved to its closed position the motor M is energized and rotates shaft *d* against the torque exerted by the weights W and *w* until the notch *h* is again brought opposite the short arm of bell-crank lever C. The short arm of the lever is immediately forced into the notch by the pull upon the long arm exerted by the winding A′. The motor-circuit is consequently opened, allowing the shaft *d* to stop in the position shown, and the bell-crank lever C acts as a latch to hold the shaft *d* in this position by means of its engagement with the notch *h*. The parts are thus restored to their normal position. It will be seen that the alarm device D goes automatically to its danger position upon the breaking of any one of the electric circuits, all the electroresponsive devices being used either to return the alarm device to its safety

position or to maintain it in that position. Absolute protection is thus afforded, a failure in the lamp or in any one of the electroresponsive devices or in any one of their circuits resulting only in the stopping of the train.

In Fig. 2 I have shown a somewhat simplified form, the motor being omitted and the alarm device being restored to safety position by hand. The armature *a* of winding A controls the circuit of a second magnet-winding E, the armature *e* of which acts as a latch for the alarm device D. As shown in the drawings, the magnet-winding E acts to withdraw the latch *e* to allow the member D to go to safety position. If preferred, however, the winding E may be arranged to hold the latch *e* in safety position against a spring or weight, as in Fig. 1. In addition to or in place of the trip D any other alarm device may be employed—as, for instance, an alarm-bell F, which is shown in Fig. 2 connected in parallel to the magnet-winding E.

Other modifications may be made in the arrangement of the parts of the system, and I aim in the appended claims to cover all such modifications which are within the scope of my invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, an electroresponsive device in circuit with said lamp, and an alarm device adapted to be engaged by a passing train and controlled by said electroresponsive device.

2. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, an alarm device adapted to be engaged by a passing train, and electroresponsive means operative upon failure of current in said lamp for moving said device into position to be engaged by a train.

3. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, an alarm device adapted to give warning to a passing train, means tending to move said device to danger position, means for restraining said device in safety position, and electroresponsive means operative upon a failure of current in said lamp for releasing said device to permit it to move to danger position.

4. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, a magnet-winding connected in series with said lamp, and an alarm device adapted to be engaged by a passing train controlled by said magnet-winding.

5. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, an alarm device adapted to give warning to a passing train, means tending to move said device to danger position, means for restraining said device in safety position, a magnet-winding connected in series with said lamp, and means controlled by said magnet-winding for releasing said device to permit it to move to danger position.

6. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, an alarm device adapted to give warning to a passing train, means tending to move said device to danger position, a latch for restraining said device in safety position, a magnet-winding connected in series with said lamp, and means controlled by said magnet-winding for tripping said latch.

7. In a railway signal system, a semaphore-signal, an electric lamp for lighting said signal, an alarm device adapted to give warning to a passing train, means tending to move said device to danger position, a latch for restraining said device in safety position, a magnet-winding connected in series with said lamp, means controlled by said magnet-winding for tripping said latch, electroresponsive means controlled by said magnet-winding for returning said device to safety position, and means for breaking the circuit of said electroresponsive means when said device is restored to safety position.

8. The combination with the light of a railway-signal, a circuit adapted to be opened when it is extinguished, and a safety apparatus comprising a trip and a part controlled from said circuit which, when the circuit is opened, permits the trip to move to its operative position.

9. The combination with the light of a railway-signal, a circuit adapted to be opened when the light is extinguished, a safety apparatus comprising a trip and an electrica ly-operated part included in said circuit, which part when the circuit is opened permits the trip to move to its operative position.

10. The combination with an electric light of a railway-signal, a circuit therefor, a safety apparatus comprising a trip and controlled from said circuit and said safety apparatus being adapted when said circuit is opened to set its trip to its operative position.

In witness whereof I have hereunto set my hand this 14th day of June, 1904.

FRED B. COREY.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.