No. 611,894. Patented Oct. 4, 1898.

J. P. COLEMAN.

SIGNALING.

(Application filed Jan. 3, 1898.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

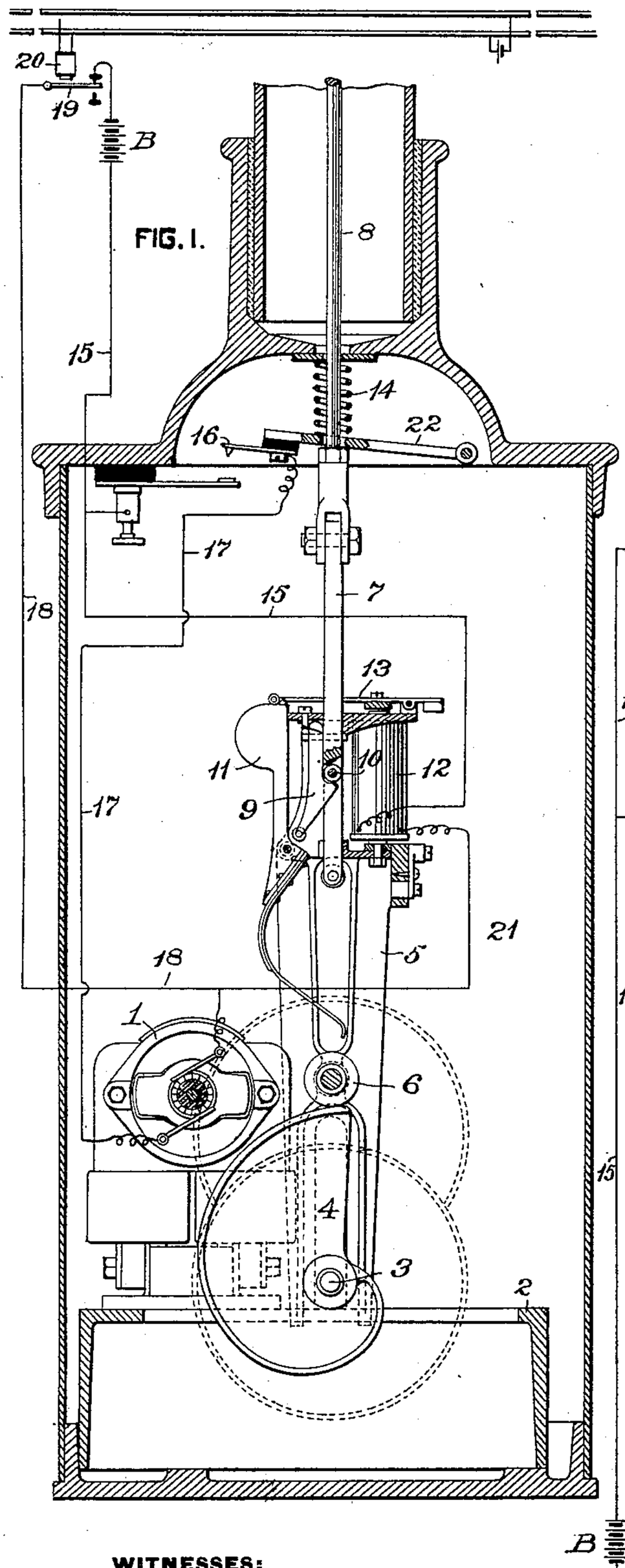

FIG. 2.

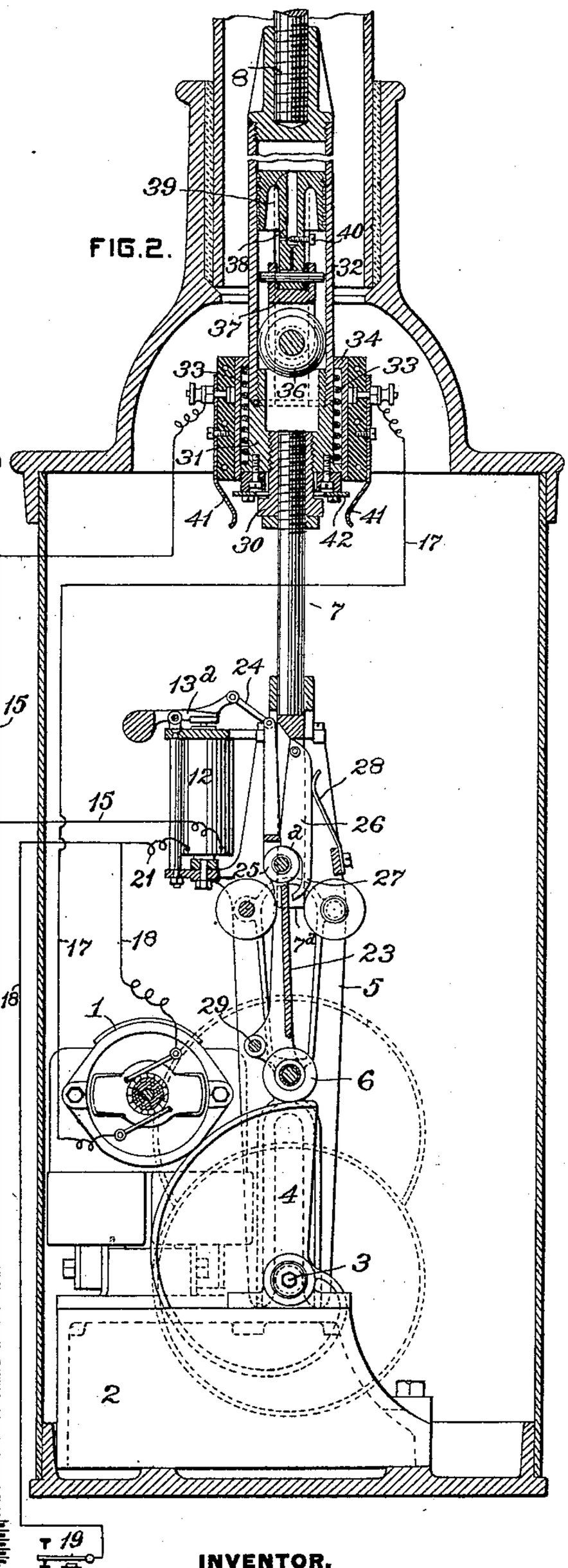

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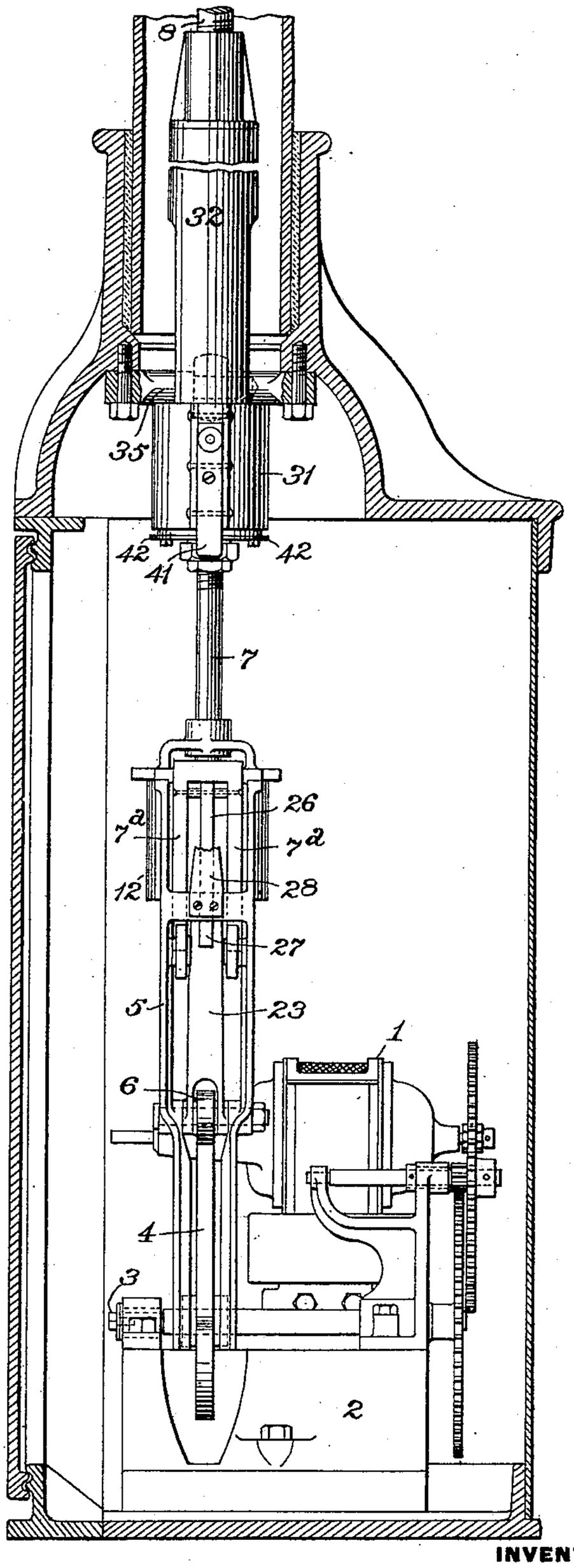
FIG. 3.



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UNITED STATES PATENT OFFICE.

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SIGNALING.

SPECIFICATION forming part of Letters Patent No. 611,894, dated October 4, 1898.

Application filed January 3, 1898. Serial No. 665,359. (No model.)

To all whom it may concern:

Be it known that I, JOHN PRESSLEY COLEMAN, a citizen of the United States, residing at Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Signaling, of which improvements the following is a specification.

In automatic signaling it is necessary to insure the movement of the signal from clear to danger position whenever in the orderly operation of the apparatus the track-section controlled by the signal is occupied by a train or otherwise rendered impassible to the movement of a succeeding train. It is customary to so weight the semaphore-signals that the signal will have a constant bias or tendency to move to danger position. The weight, however, cannot be excessive on account of its resistance to the movement of the signal to clear position. Hence it sometimes happens that the signal-blade will be so weighted by ice and snow or there will be such friction in movable parts of the signal-operating mechanism as to prevent this automatic movement of the signal to danger position.

The object of the present invention is to provide means whereby a return of an electrically-actuated signal to danger position can be insured, the means employed for such return movement being rendered operative by the movement of the signal to clear position.

It is a further object of the invention to so construct the parts of an electric slot mechanism that they will when released from control of the slot-magnet automatically fall apart, so as to release the signal and permit its automatic movement to danger position.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of an automatic signal having the returning device applied thereto. Fig. 2 is a sectional elevation of a signal, showing a modification of the returning mechanism and also having my improved slot mechanism applied thereto. Fig. 3 is a sectional elevation, being taken on a plane at right angles to the plane of section of Fig. 2.

In the practice of my invention the electric motor 1 is mounted upon a suitable base or foundation 2, and its armature-shaft is connected through suitable interposed gearing to a shaft 3, on which is secured a cam 4. The frame 5 of the slot mechanism is slotted at its lower end, so as to form guide-forks adapted to pass on opposite sides of the shaft 3 and guide the frame in its vertical movement. On this frame is mounted a friction-roller 6, against which the cam bears to raise the slot-frame. This frame is provided near its upper end with suitable guide-openings for the bar 7, which is connected in the construction shown in Fig. 1 by a simple joint to signal-rod 8. The bar 7 is detachably connected to the slot-frame by a dog 9, provided with a shoulder adapted to project under a pin or roller 10 on the bar 7. The dog is normally held with its shoulder under the pin 10 by a latch 11, pivotally mounted on the slot-frame and held in locking position by the magnet 12, operating through its armature and armature-lever 13^a, which is provided at its free end with a hook adapted to engage a projection on the latch 11. The dog 9 is provided with laterally-projecting wings resting upon ledges on the slot-frame, with a capability of swinging back and forth, so as to bring its shoulder into and out of engagement with a pin or roller 10. The latch 11 is so constructed and mounted on the slot-frame that when freed from the lever 13 it will swing outwardly, thereby permitting the dog 9 to move out from under the pin or roller 10 and the signal to drop to danger position.

In order to insure the movement of the signal from clear to danger position in case its counterweight is rendered inoperative by the collection of ice or snow on the blade or through other means, a spring 14 is interposed between a shoulder on the signal-rod and the stationary abutment, which may be formed by a part of the shell or casing inclosing the signal-operating mechanism. This spring is made of such a length compared

with the movement of the signal-rod as to be compressed only during the latter part of the movement of the signal to clear position when the signal and its operating mechanism have attained a considerable momentum, at which time the resistance presented by the spring will have no material effect on the motor in clearing the signal.

The circuit of the motor consists, starting from battery B, of the wire 15, make-and-break mechanism 16, wire 17, the motor, wire 18, armature 19, and front contact of track-relay 20 to battery. The circuit for the slot-magnet is formed by wire 15, magnet 12, wires 21 and 18, armature 19, and front contact of track-relay 20 to battery. The make-and-break mechanism 16 is formed by two springs, one of which is secured to a block of insulated material attached to the casing of the signal mechanism or other suitable support and a spring attached to but insulated from a lever 22, which is pivotally supported in such relation to the signal-rod and spring 14 that it will be moved toward and from the other member of the make-and-break mechanism by said parts. This make-and-break mechanism 16 is so arranged that the lever 22 will be lifted by the shoulder on the signal-rod to open the make-and break mechanism 16 just as the signal reaches clear position and will be closed by the action of the spring as the signal moves from clear position.

In lieu of the construction shown in Fig. 1 it is preferred to employ that illustrated in Figs. 2 and 3. The slot mechanism in my preferred construction is formed by a lever 23, having its lower end mounted by preference on the pin forming the journal of the friction-roller 6 and having its upper end connected by a link 24 to one end of the armature-lever 13^a, which has its opposite end weighted to lift the armature away from its magnet. On the lever 23 is mounted a friction-roller 25, adapted to serve as a support for the dog 26, which is mounted between prongs 7^a, forming the lower end of the bar 7. This dog 26 is so mounted between the prongs that its upper end will bear against the base of the forks 7^a, as clearly shown in Fig. 2. The dog is provided with a shoulder *a*, adapted to rest upon the roller 25, and with a tail or extension 27, which projects below the roller 25 and is adapted to bear against the lever 23 in certain positions of the parts, as hereinafter described. It will be observed that the center of motion of the roller 25 and the point at which the dog 26 bears upon said roller are in line with each other, but a little to one side of the pivotal point of the lever 23, so that the pressure of the bar 7 on said roller will tend to throw the lever 23 to the left. The center of gravity of the lever 23 is in a vertical plane passing to one side of its pivotal point, so that the lever has a constant tendency to move out of operative relation with the dog. As the lever moves to the left the lower end of the dog 26 will be carried with it until the end of the tail 27 strikes against the lever and forces the shoulder off the roller 25. It will also be observed that when the magnet 12 is deënergized the weight on the outer end of the armature-lever 13^a will tend to lift the inner end of said lever, and thereby exert a pull through the link 24 upon the upper end of the lever 23. A spring 28 is secured to the frame 5 in such relation to the dog 26 that its free end will bear upon the dog to force the same toward the lever 23, thereby holding the shoulder *a* on the roller 25 and exerting a pressure against the lever 23 in such direction as to shift the lever when free to move away from the dog 26.

As soon as the magnet 12 is deënergized the several parts will fall away from operative position, thereby permitting the bar 7 and the signal which is connected thereto to drop to danger position. When the frame is permitted to drop by the rotation of the motor and the cam 4, a friction-roller 29, mounted on the lever 23, will strike against the straight or radial face of the cam, and thereby force the lever 23 to the right or to such position as will cause its roller 25 to pass under the shoulder *a* of the dog 26 when the frame has been sufficiently lowered. As the circuit of the magnet 12 is closed simultaneously with the closure of the motor-circuit the lever 13 will be held by such magnet in position to lock the roller 25 under the shoulder *a*, so that as the cam continues to rotate and raise the frame 5 the bar 7 and the signal will be moved to clear position.

The bar 7 is threaded at its upper end for the reception of an internally and externally threaded plug 30, the external thread being made the reverse of the internal thread, so as to facilitate an accurate adjustment of the parts. This plug screws into a socket 31, which is attached to the lower end of a cylinder 32, which has its upper end connected to the lower end of the signal-rod 8. This socket 31 is provided near its lower end with an outwardly-projecting flange or shoulder, forming a bearing for the lower end of the spring 33, the upper end of said spring bearing against an inwardly-projecting flange or shoulder on a sleeve 34, surrounding the socket. As the bar 7 is raised by the frame 5 to clear the signal the sleeve 34 will be caused to move upwardly therewith until its upper end strikes against a stationary abutment, as the cross-head 35, having its ends secured to the shell or casing of the signal mechanism. Any further upward movement of the bar 7 will effect a compression of the spring 33, and the tension thus applied will be utilized in effecting a starting movement to the signal from clear position. The cross-head 35 projects through longitudinal slots formed in the cylinder 32, and has a roller 36, loosely mounted on the portion within the cylinder. On the cross-head 35 are also loosely mounted the arms of a block 37,

which is pivotally connected to the stem 38 of a piston 39. It will be observed that the axis of the pivotal connection between the block 37 and the stem 38 is at right angles to the axis of the pivotal connection between the block 37 and the cross-head 35, so that these two connections form a gimbal-joint between the cross-head and the piston, thereby permitting the piston to accommodate itself or to aline itself to variations in position of the cylinder 32, which is guided in its vertical movement by the roller 36. As shown in Fig. 2, a passage is formed through the piston and its stem 38, and the outlet-port of such passage is controlled by a screw-valve 40, whereby the escape of air from said port can be controlled and a cushion formed to check the movement of the signal when moving automatically to danger position.

The make-and-break mechanism for opening the motor-circuit as the signal reaches clear position is formed by springs 41, attached to but insulated from the sleeve 34, and a metallic ring 42, secured to but insulated from the socket 31. These parts are so arranged that when the signal moves to danger position the ring 42 will be brought into contact with the springs 41, thereby closing at that point the circuit through the motor. As the bar 7 and the socket are raised by the frame the ring will remain in contact with the springs 41 until a compression of the spring 32 occurs. As the spring is compressed the ring 42 will pass out of contact with the springs 41, thereby breaking the motor-circuit; but as the motor and the parts operated thereby have at this time attained a considerable momentum a further compression of the spring 32 will occur. This compression will be sufficient to impart an initial movement to the signal from clear position, such impulse being supplemental to the action of the counterweight of the signal.

I claim herein as my invention—

1. In a signaling apparatus, the combination of a signal having a bias to danger position, an electric motor having a detachable connection to the signal, a make-and-break mechanism in the motor-circuit adapted to be opened by the signal as it approaches clear position and a spring arranged to be placed under tension as the signal is cleared and operative on the release of the signal to impart an initial movement toward danger position, substantially as set forth.

2. In a signaling apparatus, the combination of a signal having a bias to danger position, a motor, a frame vertically movable by the motor, a lever pivotally mounted on the frame, a dog pivotally connected to the signal-rod, and adapted to engage a shoulder or projection on the lever, a magnet and an armature-lever having a bias away from the magnet and having a jointed connection to the lever, substantially as set forth.

3. In a signal apparatus, the combination of a signal having a bias to danger position, a motor for clearing the signal, an electrically-controlled slot mechanism for detachably connecting the motor to the signal, the several parts of such slot mechanism being constructed so that each will automatically move out of its holding position on the deënergizing of the magnet of the slot, substantially as set forth.

4. In a signal apparatus, the combination of a signal having a bias to danger position, an electric motor having a detachable connection to the signal, a spring surrounding the signal-rod and bearing at one end against a shoulder, a sleeve arranged outside of the spring and provided with a bearing for one end thereof and a stationary abutment for limiting the movement of the sleeve with the signal-rod, substantially as set forth.

5. In a signaling apparatus, the combination of a signal having a bias to danger position, mechanism for shifting the signal to clear position, a cylinder forming part of the connection between the signal and its operating mechanism, a piston arranged in said cylinder and having a flexible connection to a stationary support, the piston being provided with a port for permitting a regulated escape of fluid from the cylinder, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN PRESSLEY COLEMAN.

Witnesses:

DARWIN S. WOLCOTT,

F. E. GAITHER.