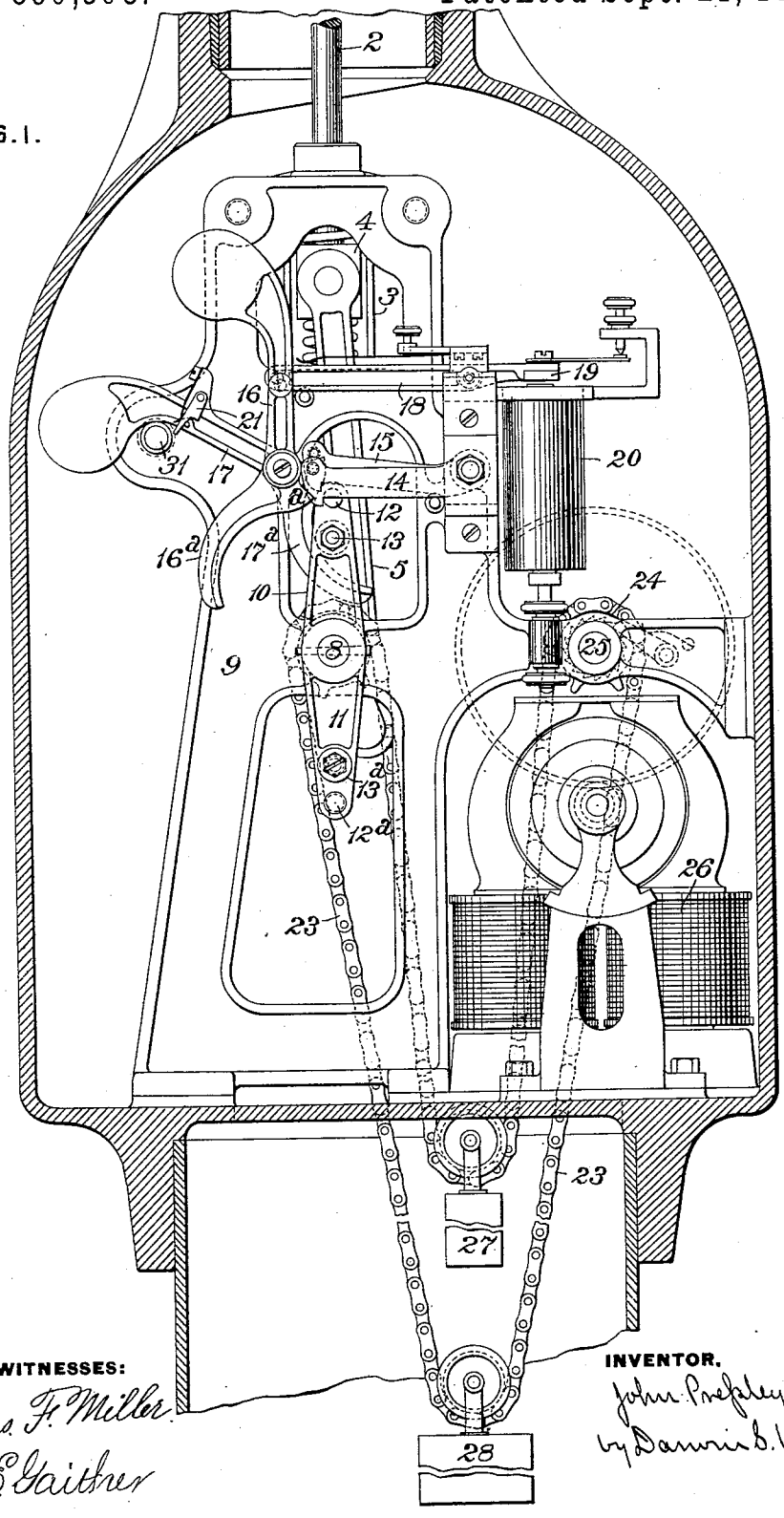
(No Model.) 4 Sheets—Sheet 1.

J. P. COLEMAN.

SIGNALING APPARATUS.

No. 590,303. Patented Sept. 21, 1897.

FIG. 1.



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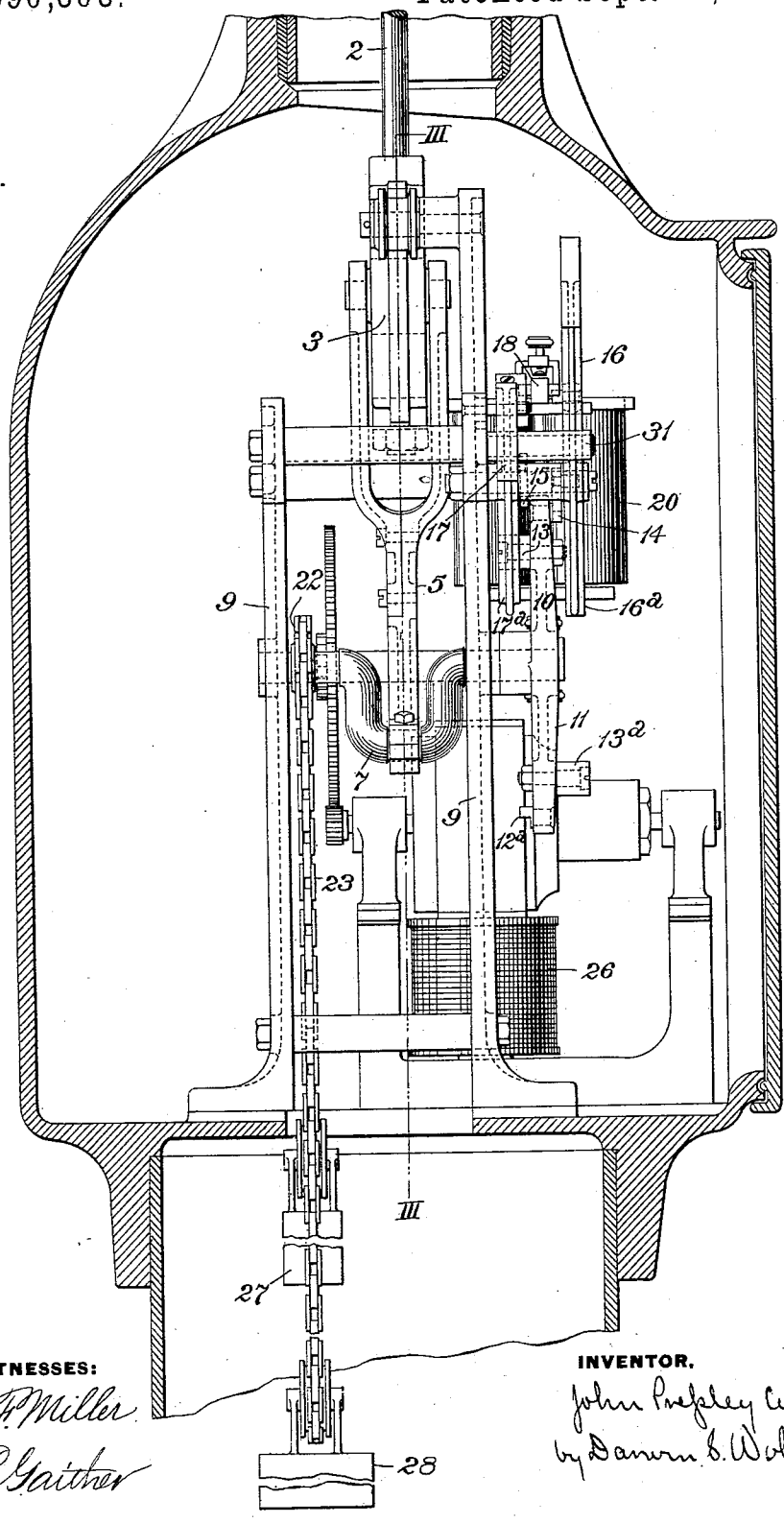
(No Model.) 4 Sheets—Sheet 2.

J. P. COLEMAN.

SIGNALING APPARATUS.

No. 590,303. Patented Sept. 21, 1897.

FIG. 2.



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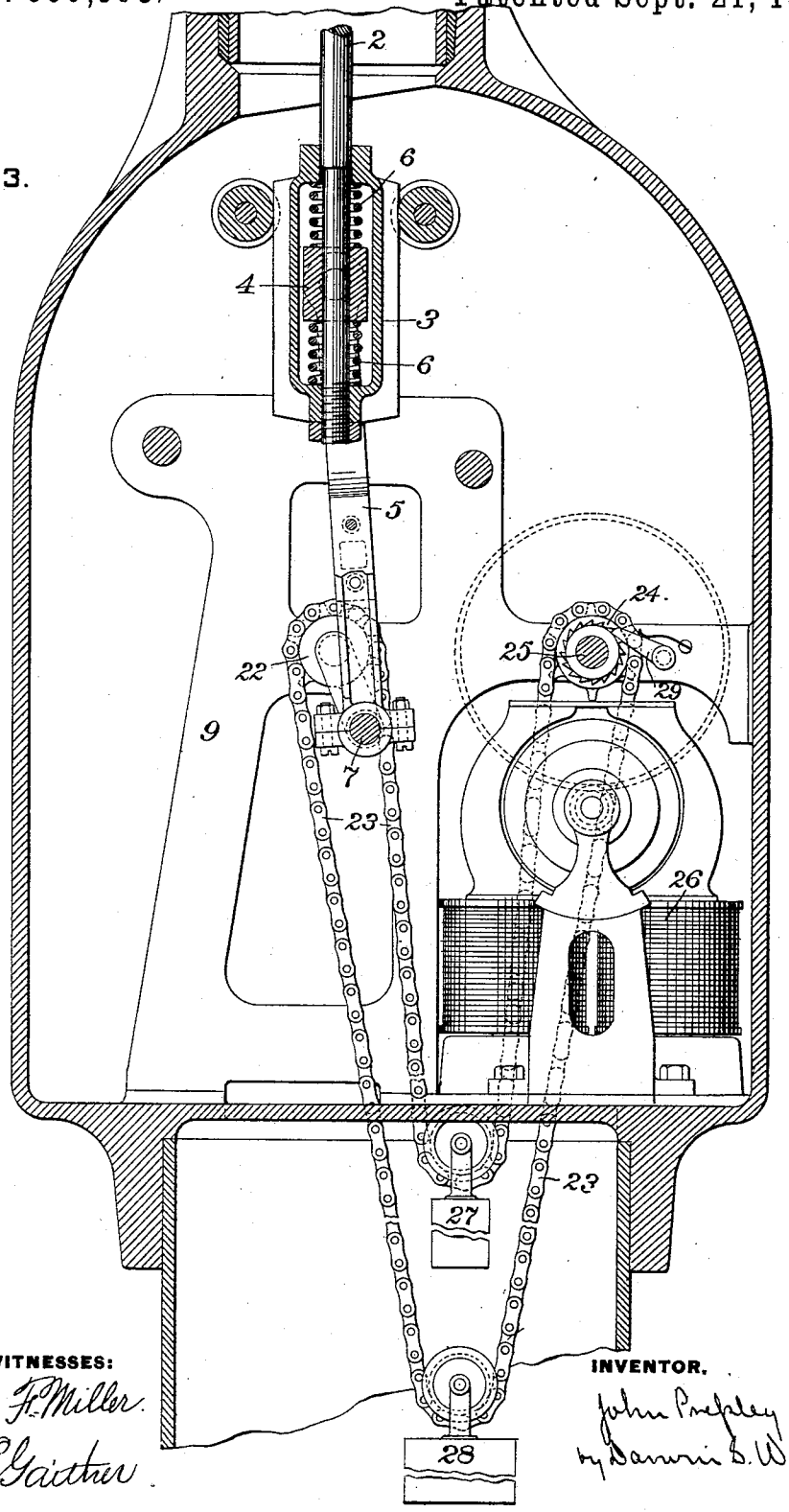
(No Model.) 4 Sheets—Sheet 3.

J. P. COLEMAN.

SIGNALING APPARATUS.

No. 590,303. Patented Sept. 21, 1897.

FIG. 3.



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(No Model.) 4 Sheets—Sheet 4.

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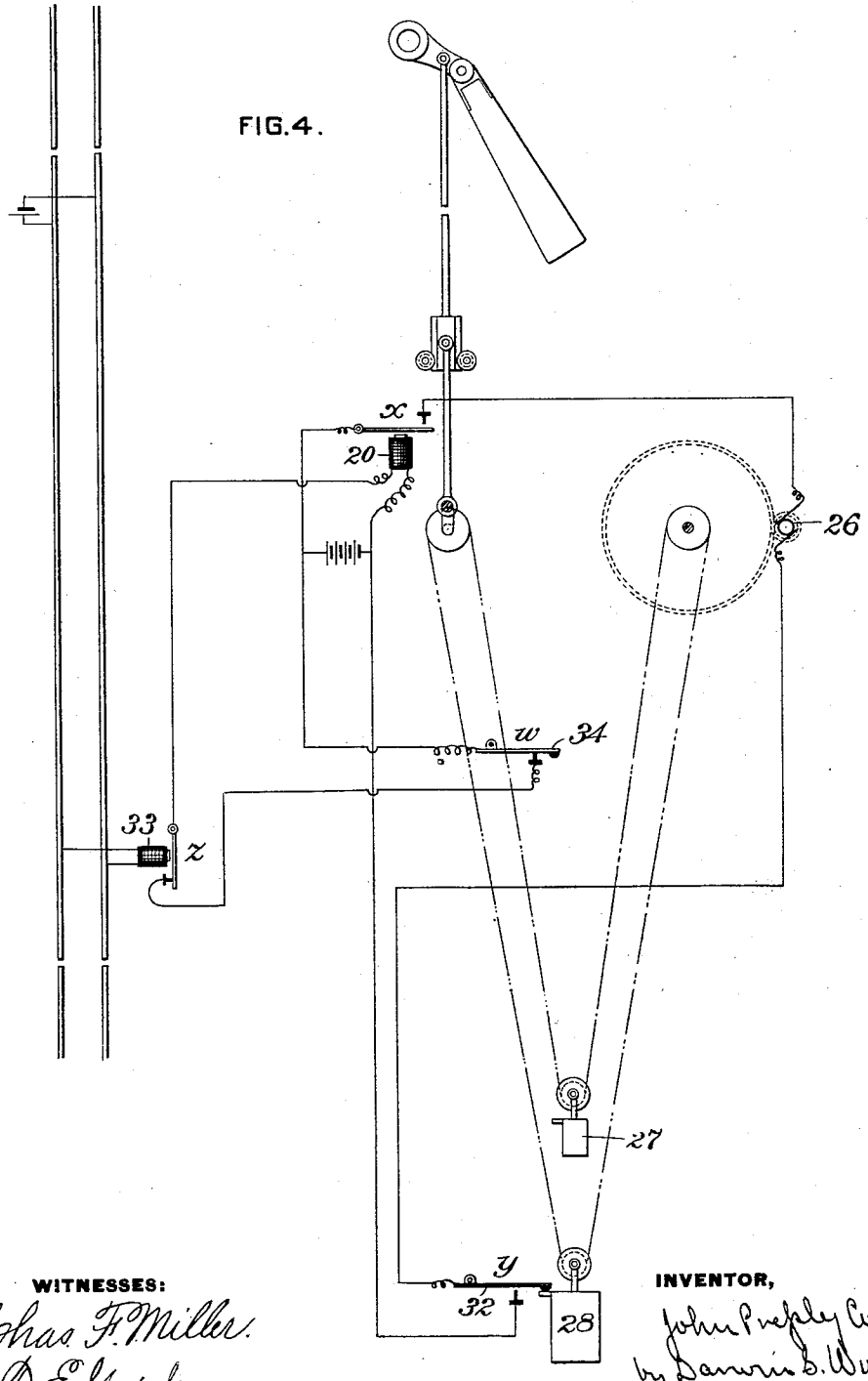
SIGNALING APPARATUS.

No. 590,303. Patented Sept. 21, 1897.

FIG. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN PRESSLEY COLEMAN, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SAME PLACE.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 590,303, dated September 21, 1897.

Application filed May 29, 1897. Serial No. 638,702. (No model.)

To all whom it may concern:

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

The invention described herein relates to certain improvements in automatic signals for railways, and has for its object a construction of apparatus whereby the signal may be controlled in its movements from "clear" to "danger" and from "danger" to "clear" by the passage of the train over the track-section controlled by such signal.

It is a further object of the invention to provide for the instantaneous operation of the signal as the train enters and leaves the section.

The invention has also for its object a construction and arrangement of apparatus whereby the signal may be operated a number of times in quick succession.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of the signal-operating mechanism; Fig. 2, a side elevation of the same; Fig. 3, a sectional elevation, the plane of section being indicated by the line III III, Fig. 2; and Fig. 4 is a diagrammatic view illustrating the circuits controlling the signal-operating motor.

In the practice of my invention the signal 1, which is preferably of the semaphore type, is so constructed and arranged as to have, when free to move, a bias to danger position, and is connected to the upper end of the signal-rod 2. This rod has attached to its lower end a slotted sleeve 3, within which is arranged a cross-head 4, provided with trunnions adapted to engage the forked ends of the pitman 5. Springs 6 are interposed between the cross-head and the ends of the slotted sleeve and serve to relieve the mechanism and the signal from sudden shocks and jars incidental to the shifting of the signal. The lower end of the pitman 5 is connected to the crank 7, formed on the shaft 8, mounted in suitable bearings in the sides 9 of the frame. On one of the ends of the shaft 8 are secured the wings 10 and 11, which are preferably formed integral with each other. On the wing 10 are secured the catch-pin 12, projecting from one side of the wing, and a striker pin or roller 13, projecting from the opposite side of the wing, and the wing 11 is provided with similar pins 12^a and 13^a, but projecting, respectively, in opposite directions from those of the wing 10, as shown in Fig. 2.

On a suitable bracket secured to the frame are mounted catches 14 and 15, provided with shoulders adapted to engage, respectively, the pins 12 and 12^a on the wings. These catches are so mounted that when free to drop they will fall into the line of movement of the catch-pins. In order to shift the catches and hold them out of engagement with the pins 12 and 12^a, weighted arms 16 and 17 are so pivotally mounted on the frame of the machine that projections *a* thereon will strike pins *b* on the catches when the weighted arm is dropped and lift and hold the catches out of engagement with the pins. The weighted arms are held in their raised position by means of a lever 18, provided at one end with the armature 19 of the magnet 20 and at the opposite end with laterally-projecting pins, one of which will drop in front of the corresponding pin on the weighted arm 16 when the magnet is deënergized and the arm raised, as hereinafter described, and the other pin will engage a spring-catch 21 on the arm 17 when the latter is raised and the magnet energized. The arms 16 and 17 are provided with curved tailpieces 16^a and 17^a, which will lie, when the arms have dropped, in the path of movement of the shifting pins 13 and 13^a on the wings 10 and 11.

On the opposite end of the shaft 8 is keyed a sprocket-wheel 22, over which is passed a sprocket-chain 23, passing also over the sprocket-wheel 24 on the shaft 25, which is driven through suitable interposed gearing by the electric motor 26. By reference to Fig.

2 it will be seen that the sprocket-chain loops down between the sprocket-wheels 22 and 24 and passes around a pulley on the tension-weight 27. This chain also forms a loop in which is hung the driving-weight 28. It will be readily understood that if the motor be operated while the crank-shaft and sprocket-wheel 22 are held stationary the weight 28 will be lifted, and if the sprocket-wheel 24 be locked, as by the spring-pawl 29 engaging the ratchet-wheel 30, or the motor be so operated as to pull up on the sprocket-chain and the crank-shaft be free to move that the weight 28 will effect a rotation of the crank-shaft.

In describing the operation of my improved mechanism it will be considered that the signal is at "danger," a train being on the track-section controlled by the signal and the magnet 20 deënergized and the parts in the positions shown in Fig. 1. As the train passes off the track-section the magnet 20, which is included in or controlled by the track-section, will become energized, thereby so shifting the lever 18 as to disengage it from weighted arm 16 and permit the latter to drop onto the stop 31. In its downward movement the shoulder *a* on said arm will lift the catch 14 out of engagement with the pin 12, thereby permitting the weight 28, operating through the sprocket-chain 23, to rotate the crank through an arc of one hundred and eighty degrees and thereby shifting the signal to safety position. In this movement the pin 13 on the wing 10 will strike the tail 17^a of the arm 17, throwing such arm up until its spring-catch 21 will engage the pin on the lever 18, thereby holding the arm in its raised position. The shifting of this arm will permit the catch 15 to drop into the path of movement of the pin 12^a on the wing 11, so as to check the movement of such wing after it has passed through an arc of one hundred and eighty degrees. After the clearing of the signal in the manner described the train is free to enter on the track-section, and as it enters it will deënergize the magnet 20, thereby permitting the lever 18 to drop and shift its pin out of engagement with the catch 21 on the arm 17, which will then drop. This movement of the arm 17 will lift the catch 15, again permitting the weight 28 to shift the crank-shaft and the signal to danger position. As the wing 11 is turned its pin 13^a will strike the tail 16^a of the arm 16, thereby shifting the latter so as to be caught and held in raised position by the lever 18 until the magnet 20 is again energized by the passage of a train off the section. The lifting of the arm 16 permits the catch 14 to drop and catch the pin 12 on the wing 10 to stop and hold the signal at danger position.

Referring to Fig. 4, it will be seen that the motor 26 is included in a circuit having a make-and-break mechanism *x*, which is preferably controlled by the magnet 20, and a make-and-break mechanism *y*, consisting of an arm 32, adapted to be lifted by the weight 28 when raised to the highest position desired. It will also be observed that the circuit of the magnet 20 includes a make-and-break mechanism *z*, formed by the armature and contact-point of the track-relay 33, and a make-and-break mechanism *w*, formed by a contact-point and an arm 34, adapted to be raised by the tension-weight 27 when it has been lifted by the descent of the weight 28. It will be observed that the circuit of the motor 26 will be closed whenever the magnet 20 is deënergized by the entrance of a train upon the track-section. The operation of the motor at such a time is not, however, necessary, as it may be operated at any time, and in such case only the circuit-breakers *w* and *y* will be employed to control the motor-circuit; but it is preferred to employ the circuit-breaker *x* for the reason that it prevents the use of the battery to charge two circuits at the same time. The circuit-breaker *w* should be so located as to close the motor-circuit shortly before the weight 28 has reached the lowest limit of its movement, and the circuit-closer *y* should be so located that the weight 28 will open the motor-circuit just as it reaches the highest limit of its movement. By controlling the motor-circuit through the make-and-break mechanism *w*, located in the signal-circuit and operated by the descent of the weight, provision is made for setting the signal to "danger" and holding it in such position in case the motor should be inoperative to raise the weight.

The broader claims are not limited to construction and arrangement of parts specifically shown and described, as I consider within the scope of my invention such changes as will readily suggest themselves to the skilled mechanic.

I claim herein as my invention—

1. In a signal apparatus, the combination of a crank connected to a signal, a weight for rotating the crank, mechanism for controlling the rotation of the crank, an electromagnet controlling such mechanism, and a motor operative regardless of the position or movement of the signal for raising the weight, substantially as set forth.

2. In a signal apparatus, the combination of a crank connected to a signal, a weight for rotating the crank, mechanism for controlling the rotation of the crank, an electromagnet controlling such mechanism, a motor for raising the weight and controlled by said magnet, substantially as set forth.

3. In a signal apparatus, the combination of a signal, a constantly-operative weight, connections between the weight and signal whereby the latter may be shifted to danger and clear positions by the weight, mechanism operated by train movements for controlling

the descent of the weight, and a motor controlled by the movement of the weight for raising the weight, substantially as set forth.

4. In a signal apparatus, the combination of a signal, a constantly-operative weight, connections between the weight and signal, whereby the signal may be shifted to danger and clear positions by the weight, mechanism operative by train movements for controlling the descent of the weight, a motor for raising the weight and means controlled by the movement of the weight for starting and stopping the motor, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN PRESSLEY COLEMAN.

Witnesses:
DARWIN S. WOLCOTT,
F. E. GAITHER.