

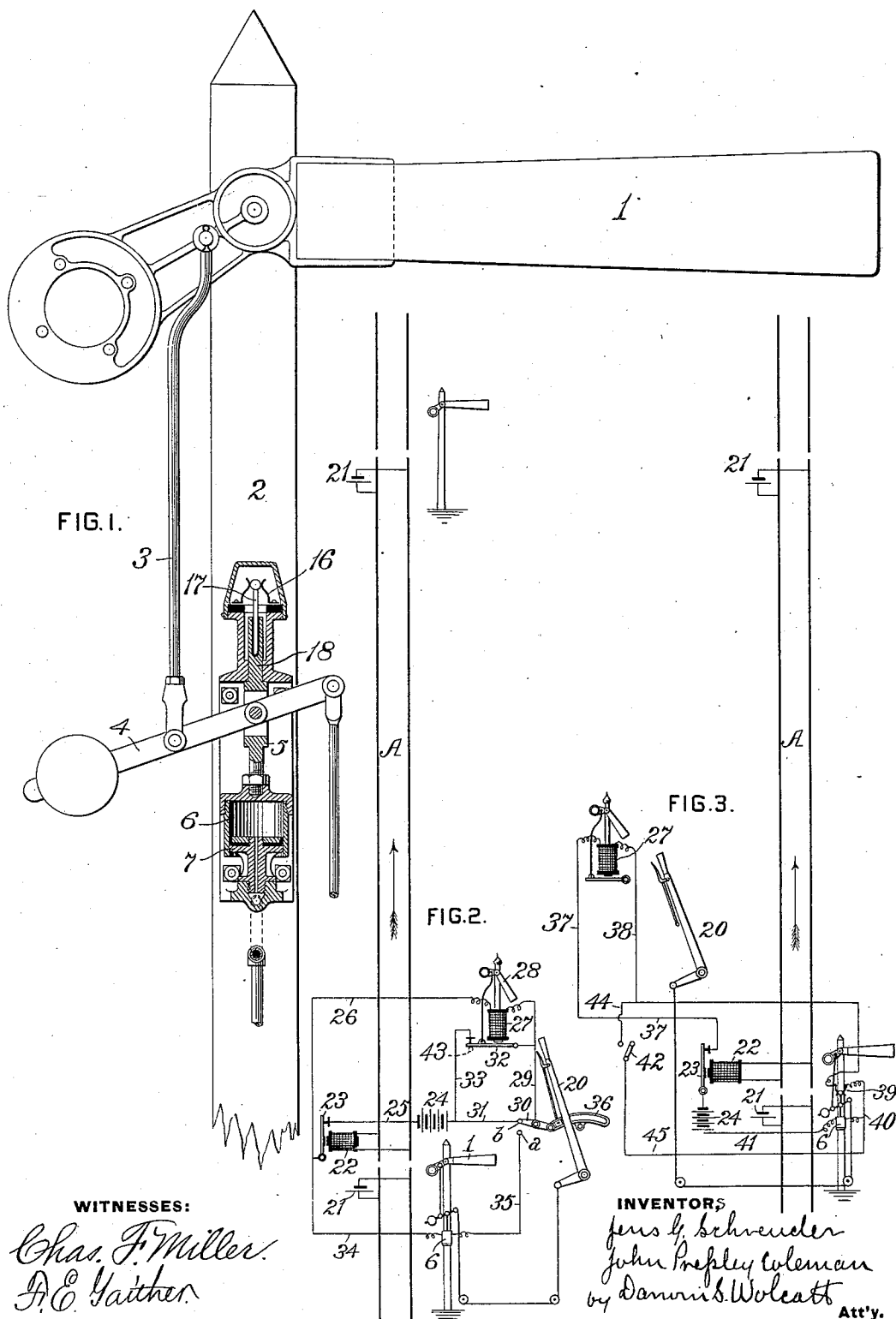
(No Model.)

J. G. SCHREUDER & J. P. COLEMAN.

SIGNALING.

No. 579,933.

Patented Mar. 30, 1897.



UNITED STATES PATENT OFFICE.

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SIGNALING.

SPECIFICATION forming part of Letters Patent No. 579,933, dated March 30, 1897.

Application filed August 26, 1896. Serial No. 603,985. (No model.)

To all whom it may concern:

Be it known that we, JENS G. SCHREUDER, a subject of the King of Sweden and Norway, residing at Edgewood Park, and 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, of which improvements the following is a specification.

The invention described herein relates to certain improvements in railway signaling, and has for its object a construction whereby the signal may be operated semiautomatically—*i. e.*, by an operator and by train movements—or automatically—*i. e.*, by train movements; and in general terms the invention consists in the construction and combination substantially as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view, partly in section and partly in elevation, of the signal and its operating mechanism. Figs. 2 and 3 are diagrammatic views illustrative of two forms or arrangements of circuits for controlling and operating the signal.

The signal and its operating mechanism are preferably constructed as described and claimed, or intended so to be, in the application of J. G. Schreuder, Serial No. 592,413, filed May 21, 1896; and it consists of a semaphore-blade 1, pivotally mounted upon a post 2 in such manner as to automatically return to normal or danger position when free to move. This signal is connected by a rod 3 to one end of a balance-lever 4, whose opposite end is connected by a rod to an operating-lever 20. The lever 4 is pivotally mounted in yoke 5, which is connected by a stem to the head of a cylinder 6, which is preferably constructed with an open lower end and is arranged to move up and down on a stationary piston 7. Fluid-pressure is admitted into the cylinder through a passage formed through the piston and its supporting-stem, and the flow of fluid-pressure to and from the cylinder is controlled by an electrically-actuated valve mechanism, as fully shown and described in the application above referred to. The yoke 5 is pro-

vided with an upwardly-projecting stem 18, in which is arranged a pin 17, having a head or enlargement at its upper end and insulated from the stem 18. On opposite sides of the path of movement of this pin 17 are arranged springs 16, which are secured on an insulated support. This pin and the springs 16 form a make-and-break mechanism, to be hereinafter described.

The signal hereinbefore described is arranged along the track, which, as is customary, is divided into sections, the rails on each section being electrically connected together but insulated from adjacent sections. The rails of each section are connected to a track-battery 21 and also to opposite poles of a track-relay 22, and the armature 23 of the track-relay forms a part of the circuits of battery 24. One of these circuits starting from the battery 24 consists of the wire 25, contact-point and armature of track-relay 22, wire 26, magnet 27 of indicator 28, wire 29, switch 30, and wire 31 to battery. A branch circuit from the one just described starts from wire 29 and is formed by armature of magnet 27, contact-point and wire 33 to battery. The third circuit from battery 24 consists of wire 25, armature and contact-point of relay 22, wire 34, magnet of valve mechanism controlling the flow of fluid-pressure to and from the cylinder 6, wire 35, switch 30, wire 29, armature 32, contact-point *e*, wire 33 to battery. The movable member of switch 30 is connected to a quadrant of signal-operating lever 20, said quadrant being adapted to be shifted by the movement of the locking-latch on said lever.

As shown in Fig. 2, the switch 30 is shifted when the lever 20 and the signal are in normal or danger position to open the circuit through the magnet of the valve mechanism of the cylinder 6, so that said cylinder and the lever 4, carried thereby, will be dropped down so that the blade will remain in danger position. When the parts are in this position and the track-section A is unoccupied, the circuit through the magnet 27 and the branch circuit through the armature 32 of said magnet will be closed, so that the blade of the indicator 28 will be in safety position, as

shown. If the signal-lever 20 be now shifted, the switch 30 will first be shifted by the movement of the latch-rod of said lever, so as to close the circuit through the magnet of the valve mechanism, which is so shifted as to admit air into the cylinder 6 and raise the cylinder or hold it in its raised position. By thus locking the fulcrum of the lever 4 as against movement the shifting of lever 20 will clear the signal 1. The movement of the switch by the latch-rod will not demagnetize the magnet 27, as the current from the battery 24 will find a path through the branch circuit, which is formed in part by the armature 32. As soon as a train enters upon section A relay 22 will be demagnetized and its armature 23 will leave the contact-point and break all the circuits of battery 24. The rupture of the circuit through the magnet of the valve mechanism of cylinder 6 will permit of the escape of fluid-pressure from said cylinder, thereby permitting the cylinder to drop and carry down with it the fulcrum of lever 4, thereby permitting the signal to go to "danger." The rupture of the circuit through the magnet 27 permits the armature 32 to drop, thereby shifting the blade of the indicator 28 and forming a break in the branch circuit. The several parts will be held in the position described until the train has passed off of section A, whereupon relay 22 will be reenergized and the armature 23 drawn against its contact-point. This movement of the armature will not, however, restore the circuits described, as the switch 30 has been shifted in clearing the signal to contact-point *a* and the armature 32 is away from its contact-point. In order to restore the circuits to normal position, the movable member of switch 30 must be shifted into contact with the point *b* of said switch, and this can only be done by throwing the lever 20 to danger or normal position. The shifting of the movable member of switch 30 by the lever 20 closes the circuit of battery 24 through magnet 27, and when this magnet becomes excited the armature 32 is drawn against its contact-point, thereby closing the branch circuit and shifting the blade of indicator 28 to "safety," thereby showing that the track-section A is unoccupied. It will be observed that the branch through armature 32 forms a part of the circuit of the magnet of valve mechanism of cylinder 6. Hence this armature must be in contact with the stop before the circuit of said magnet can be completed. It will also be observed that when said armature drops from its contact-point it can be returned to its normal position only by shifting the switch 30 to contact-point *b*, and such movement of switch can only be effected by returning the signal-lever to danger or normal position. Hence when the signal has been shifted to "danger" by the movement of a train on track-section A it cannot be cleared until the signal-lever has been returned to normal position.

In the arrangement shown in Fig. 3 the cir-

cuit of battery 24 consists of armature 23 of track-relay 22, contact-point, wire 37, magnet 27 of indicator 28, wire 38, make-and-break mechanism 39, controlled by cylinder 6, wire 40, magnet of valve mechanism of cylinder 6, wire 41 to battery. In this arrangement of circuits and make-and-break mechanisms the movement of a train on section A will deenergize relay 22, permitting armature 23 to leave its contact-point, thereby breaking the circuit through the magnet of the valve mechanism of cylinder 6. The escape of fluid-pressure from said cylinder permits the latter to drop, thereby lowering the fulcrum of lever 4 and also shifting the pin 17 from between the springs 16 of the make-and-break mechanism 39, thereby forming a second break in the circuit of battery 24. The movement of the train off from section A will reenergize relay 22, so that armature 23 will be again drawn against its contact-point, but the circuit of battery 24 cannot be completed until the signal-operating lever 20 is returned to normal or danger position, thereby raising the fulcrum of lever 4 and with it the yoke 5, and by the movement of these parts closing the make-and-break mechanism 39, thereby finally completing the circuit of battery 24. As long as a train is upon track-section A and the armature 23 away from its contact-point, the movement of lever 20 from safety to danger position and return and the consequent movement of lever 4 will simply raise and lower the cylinder 6 without affecting the signal 1; but as soon as the train has left said section and the make-and-break mechanism controlled by relay 22 is closed the shifting of lever 4 will close make-and-break mechanism 39, thereby admitting air into cylinder 6 and locking said cylinder and the fulcrum of lever 4 as against movement, and the shifting of lever 20 will correspondingly shift the signal.

It will be observed that in the arrangement thus far described it is necessary for an operator, having cleared his signal, to permit the entry of a train upon section A and, the train having passed over said section, to restore his lever to normal position before he can again operate the signal.

If in the construction shown in Fig. 2 the operator should leave his lever in clear position, thereby shifting the movable member of switch 30 to contact-point *a*, and lock the armature 32 against its contact-point by a pin 43 or other means, the signal will be automatically returned to clear position by the movement of the train off the section A. In the arrangement shown in Fig. 3 the operator can render the operation of his signal automatic by shifting the lever 20 to clear position and closing the switch 42 in the short circuit around make-and-break mechanism 39. This circuit consists, starting from battery 24, of armature 23 and its contact-point, wire 37, magnet 27 of indicator 28, wires 38 and 44, switch 42, wire 45, magnet of valve mechanism

ism of cylinder 6, wire 41 to battery. It will be observed that in the arrangement shown in Fig. 3 the make-and-break mechanism 39 is substituted for the make-and-break mechanism formed by the armature 32 and its contact-point in the arrangement shown in Fig. 2. It will also be observed that when the armature is locked by the pin 43 against its contact-point, the branch circuit including said armature performs the same function as the shunt-circuit controlled by hand-switch 42 in the arrangement shown in Fig. 3. The closing of this switch will cut out, rather, form a shunt around the make-and-break mechanism 39 and the operation of the signal thereby rendered entirely automatic.

We claim herein as our invention—

1. The combination of a signal, a signal-lever, an electrically-controlled connection between the signal and its lever, a circuit for said mechanism, an electrically-controlled indicator, the operating-magnet of said indicator being included in said circuit, a branch circuit including the armature of the indicator-magnet, a make-and-break mechanism controlled

by train movements arranged in the main circuit, and a second make-and-break mechanism in the main circuit and controlled by the signal-lever, substantially as set forth.

2. The combination of a signal, a signal-lever, an electrically-controlled connection between the signal and its lever, a circuit for said mechanism, a make-and-break mechanism controlled by train movements arranged in said circuit, a second make-and-break mechanism in said circuit and controlled by the signal-lever, and a shunt-circuit having a manually-operated switch around the second make-and-break mechanism, substantially as set forth.

In testimony whereof we have hereunto set our hands.

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