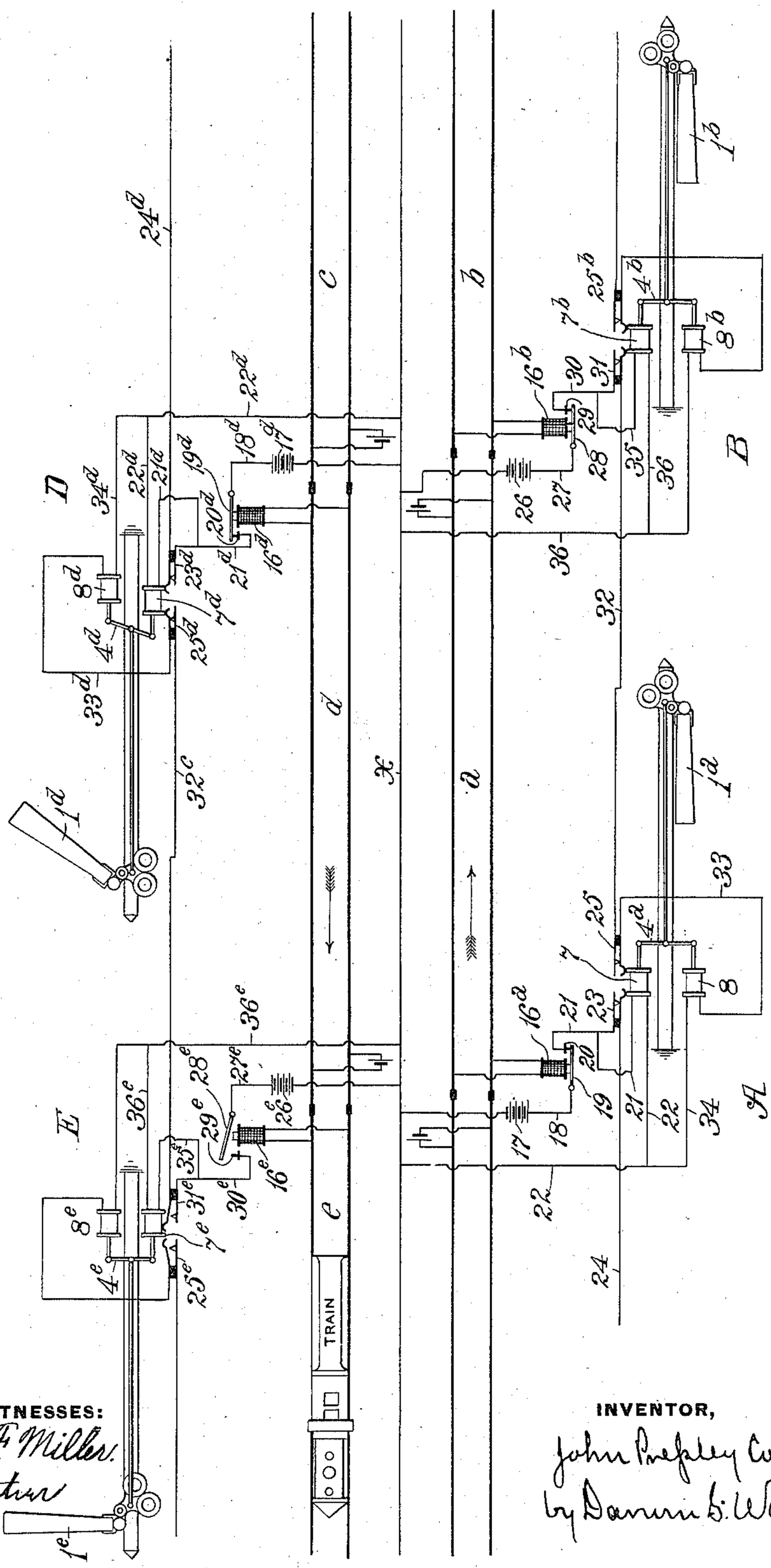
(No Model.) 2 Sheets—Sheet 1.

J. P. COLEMAN.

AUTOMATIC SIGNAL.

No. 565,839. Patented Aug. 11, 1896.

FIG. 1.



WITNESSES:

Chas. F. Miller.

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INVENTOR,

John Pressley Coleman

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Att'y.

(No Model.) 2 Sheets—Sheet 2.

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AUTOMATIC SIGNAL.

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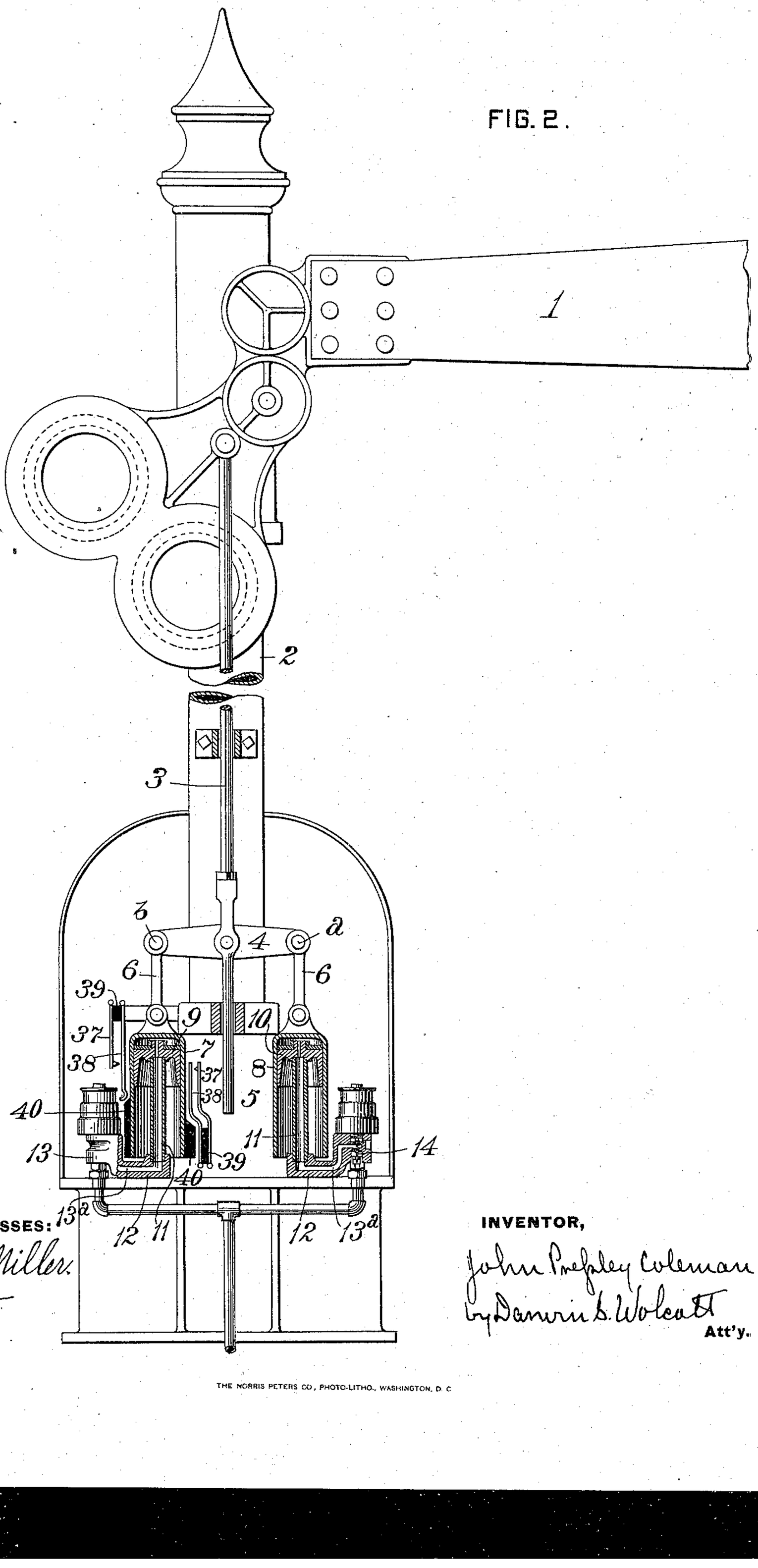
FIG. 2.



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UNITED STATES PATENT OFFICE.

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

AUTOMATIC SIGNAL.

SPECIFICATION forming part of Letters Patent No. 565,839, dated August 11, 1896.

Application filed June 1, 1896. Serial No. 593,784. (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 Automatic Signals, of which improvements the following is a specification.

The invention described herein relates to certain improvements in automatic signaling for railways, and has for its object the utilization of a three-position signal to indicate at one time the condition of one section, and subsequently the condition of the next succeeding section, in other words, employing the same signal first as a home and then as a distant signal.

In the accompanying drawings, forming a part of this specification, Figure 1 is a diagrammatic view of a portion of a double-track railway having my improved signal and system applied thereto. Fig. 2 is a view, partly in elevation and partly in section, of my improved signal.

The signal-blade 1, which is preferably of the semaphore type, is pivotally mounted upon the post 2. To the blade 1 is connected the upper end of a rod 3, which has its lower end pivotally connected to a lever 4, and is provided with an extension 5, projecting down through a guide-opening on the post. To the ends of the lever 4 are connected links 6, which have their opposite ends attached to cylinders 7 8, within which are arranged the stationary pistons 9 10. These pistons are connected by hollow stems 11 to brackets 12, attached to the base of the post and provided with ports or passages 13^a, communicating with the electrical valve mechanisms 13 and 14, to which are connected the fluid-supply pipe 15.

In operating the signal fluid-pressure is admitted to one of the cylinders, as 7, through the hollow stem 10, thereby raising the cylinder and with it one end of the lever 4, the latter turning on the pivot *a*, and thereby raising the rod 3 sufficiently far to shift the signal-blade 1 to or about to an angle of forty-five degrees. While in this position the signal-blade would indicate "caution." To set the signal to "safety," fluid-pressure is maintained in the cylinder 7, so as to hold it in its raised position, and also admitted into the cylinder 8, thereby raising the said cylinder and with it the opposite end of the lever 4, which at this time turns on the pivot-pin *b* as a fulcrum. This last movement of the lever 4 raises the signal-rod sufficiently far to turn the signal to a vertical or "safety" position.

In applying my improvement to railway-tracks one signal is arranged at the entrance end of each track-section, as shown in Fig. 1. Each track-section is insulated, as customary, from adjacent sections, and the rails thereof form parts of the circuits of the track-batteries, said circuits also including suitable relays 16^a 16^b, &c., whose armatures control the signal-operating circuits. The circuits for the signal-controlling track-section *a* consist, starting from battery 17, of wire 18, armature and contact 19 and 20, wire 21, magnet of the valve mechanism of cylinder 7, wire 22 to ground, or common return-wire *x*, which is also connected to the battery 17. The wire 21 branches and goes to one member of make-and-break mechanism 23, whose other member is connected by a wire 24 to a battery in the next preceding section. As a train enters upon section *a* the relay 16^a is cut out, thereby permitting the armature 19 to leave the contact-point 20, thus breaking the circuit through the magnet controlling the valve mechanism of cylinder 7. This de-energizing of the valve-magnet so shifts the valve as to permit of the escape of fluid-pressure from the cylinder 7, so that the cylinder 7 can drop and shift the signal to "caution."

The downward movement of the cylinder 7 so shifts the make-and-break mechanism 25 as to open a circuit consisting, starting with battery 26, of wire 27, armature 28, and contact-point 29, of track-relay 16^b, wire 30, make-and-break mechanism 31, wire 32, make-and-break mechanism 25, wire 33, magnet-controlling-valve mechanism of cylinder 8, wires 34 and 22 to ground or common wire *x*. The rupture of this circuit by the downward movement of the cylinder 7 deënergizes the magnet of valve mechanism of cylinder

8, thereby permitting the cylinder to drop and complete the movement of signal 1 to "danger" position, so as to protect the rear of a train upon section *a*.

As the train passes off section *a* relay 16^a will be reënergized, closing the make-and-break mechanism consisting of armature 19 and contact-point 20, and thereby closing the circuit through the valve mechanism of cylinder 7 and admitting air into said cylinder, so as to raise the same and shift the signal to "caution" position. This upward movement of the cylinder 7 closes the make-and-break mechanism 25 in the circuit controlling the flow of fluid-pressure to and from cylinder 8, but nearly simultaneous with the closing of the make-and-break mechanism 25 a second make-and-break mechanism 31 in the same circuit is opened by the downward movement of the cylinder 7^b of the signal at station B. This movement of the cylinder 7^b is effected by the entrance of train upon track-section *b* cutting out relay 16^b and opening the make-and-break mechanism formed by armature 28 and contact-point 29 in the circuit leading to the valve mechanism of the cylinder 7^b, said circuit consisting, starting with battery 26, of wire 27, armature and contact-point 28 and 29, wires 30 and 35, magnet of valve mechanism of cylinder 7^b, wire 36, to ground. In addition to opening the make-and-break mechanism 31, the downward movement of the cylinder 7^b opens the make-and-break mechanism 25^b, which is included in the circuit of a battery corresponding to batteries 17 and 26 and controlled by the track-relay of the section next succeeding track-section *b*. In this circuit is included the electrically-controlled valve mechanism of cylinder 8^b, so that when said circuit is broken the valve of the mechanism controlling cylinder 8^b is opened, permitting the escape of fluid-pressure therefrom and the consequent dropping of the cylinder 8^b, so as to shift the signal 1^b from "caution," to which position it had been shifted by the downward movement of cylinder 7^b, to "danger" position, to protect the rear end of a train upon track-section *b*.

As the train passes off track-section *b* the circuit from battery 26 will be closed by the energizing of relay-magnet 16^b at the make-and-break mechanism consisting of armature 28 and contact-point 29, thereby energizing the magnet of the valve mechanism of cylinder 7^b, so as to shift the valve of said mechanism to permit the flow of fluid-pressure to the cylinder, thereby raising the cylinder and shifting the signal 1^b to "caution." This upward movement of the cylinder 7^b closes the make-and-break mechanism 31 in the circuit in which the magnet of valve mechanism of cylinder 8 is included at station A, thereby energizing said magnet, which will so shift the valve as to permit fluid-pressure to flow into the cylinder 8, raising the same and so turning the signal 1^a from "caution" position, to which it had been shifted on the entrance of a train onto track-section *b*, to "safety" position.

It will be observed that the make-and-break mechanisms controlled by the track-relays 16^a 16^b, &c., form parts of the circuits controlling the valve mechanisms of cylinders 8 8^b, &c., so that as long as such make-and-break mechanisms are open from any cause the cylinders 8 8^b, &c., cannot be charged, and hence the signals will stand either at "caution" or "danger," dependent on the position of cylinders 7 7^b, &c., *i. e.*, whether charged or not.

It is characteristic of my improvement that the entrance of a train upon a track-section first shifts the signal controlling said section to "caution" position, and at the movement of the signal to such "caution" position so shifts or changes the relation of other parts of the mechanism as to effect a further movement of the signal to "danger" position. It is also characteristic of my improvement that the movement of a signal controlling a section from "safety" to "caution" effects, through the medium of interposed mechanism or devices, the shifting of a signal of the preceding section to "caution" position; and further, the movement of a signal from "danger" to "caution" position effects, through the medium of interposed mechanism, the shifting of the preceding signal to "safety" position.

The make-and-break mechanisms employed for controlling one signal by the next succeeding signal may be operated by the signal itself or any movable part of the operating mechanism, but it is preferred to employ the construction shown in Fig. 1. This construction consists of two springs 37 and 38, secured on opposite sides of an insulating-block 39, supported by a bracket projecting from a signal-post. These springs are so attached as to stand normally away from each other, and are supported in such relation to the cylinder 7 that when the cylinder is raised from its lowest position shoulders 40 on the cylinder will force the springs together, thereby completing the circuit.

I claim herein as my invention—

1. In a signaling system, the combination of a track-section, a signal controlling the movement of trains along such section, mechanism controlled by the movement of trains to shift said signal to "caution," and mechanism controlled by the caution mechanism to shift said signal to "danger," substantially as set forth.

2. A signal, having in combination a pivotally-mounted blade and floating lever pivotally mounted to the signal-blade, and two independent motors connected one to each end of the floating lever, substantially as set forth.

3. A signal having in combination a movably-mounted blade, a fluid-pressure cylinder

for shifting said blade from "danger" to "caution" position, and a second fluid-pressure cylinder for shifting the blade from "caution" to "safety," substantially as set forth.

4. A signal having in combination a pivotally-mounted blade, a floating lever pivotally connected to the signal-operating rod, and two fluid-pressure cylinders connected one to each end of the floating lever, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN PRESSLEY COLEMAN.

Witnesses:
DARWIN S. WOLCOTT,
M. S. MURPHY.