

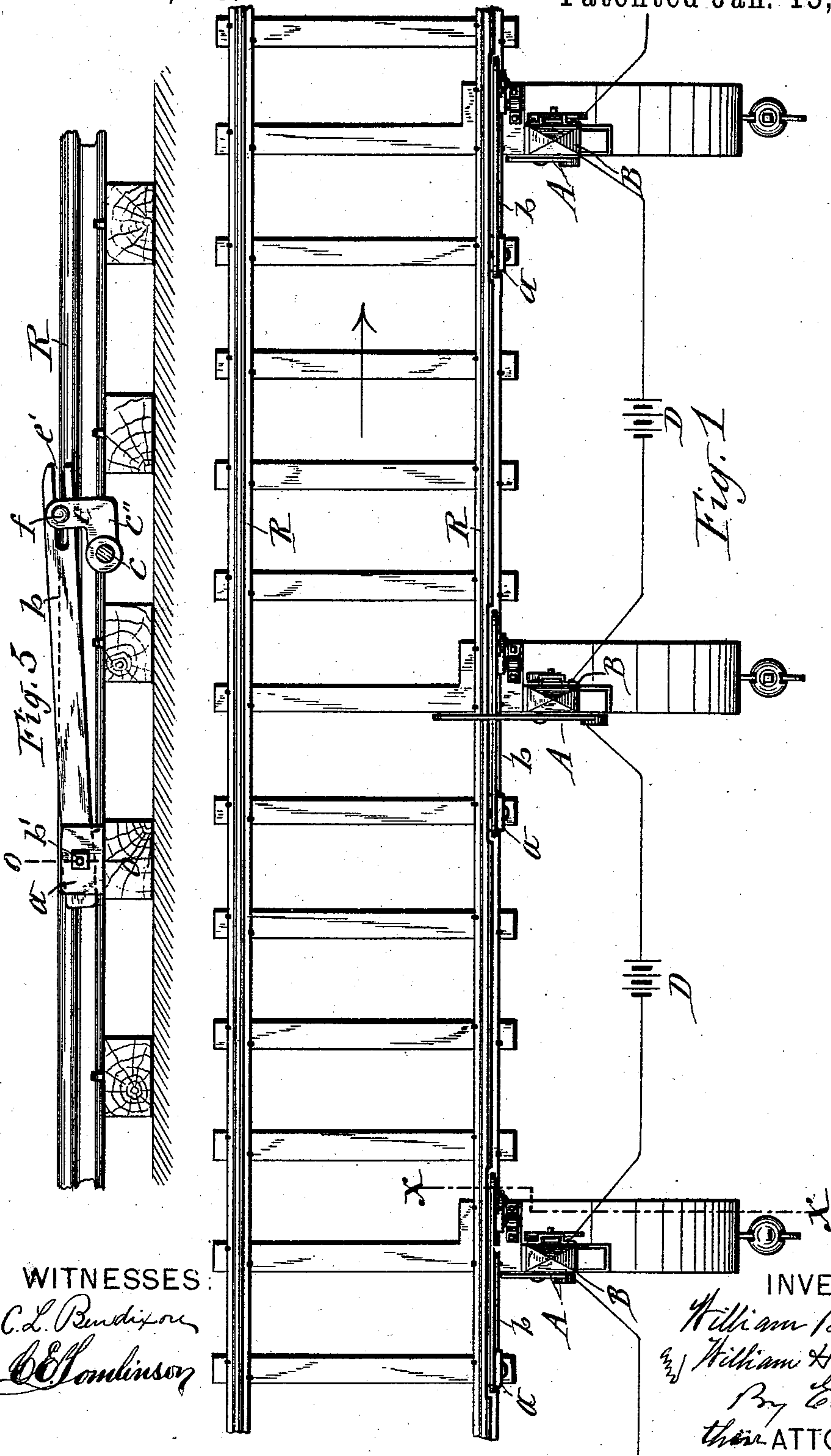
(No Model.)

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W. BERRIGAN & W. H. McCLURE.
RAILWAY BLOCK SIGNAL.

No. 532,633.

Patented Jan. 15, 1895.



WITNESSES:
C. L. Bendixson
C. E. Robinson

INVENTORS.
William Berrigan
William H. McClure
By E. Laess
their ATTORNEY

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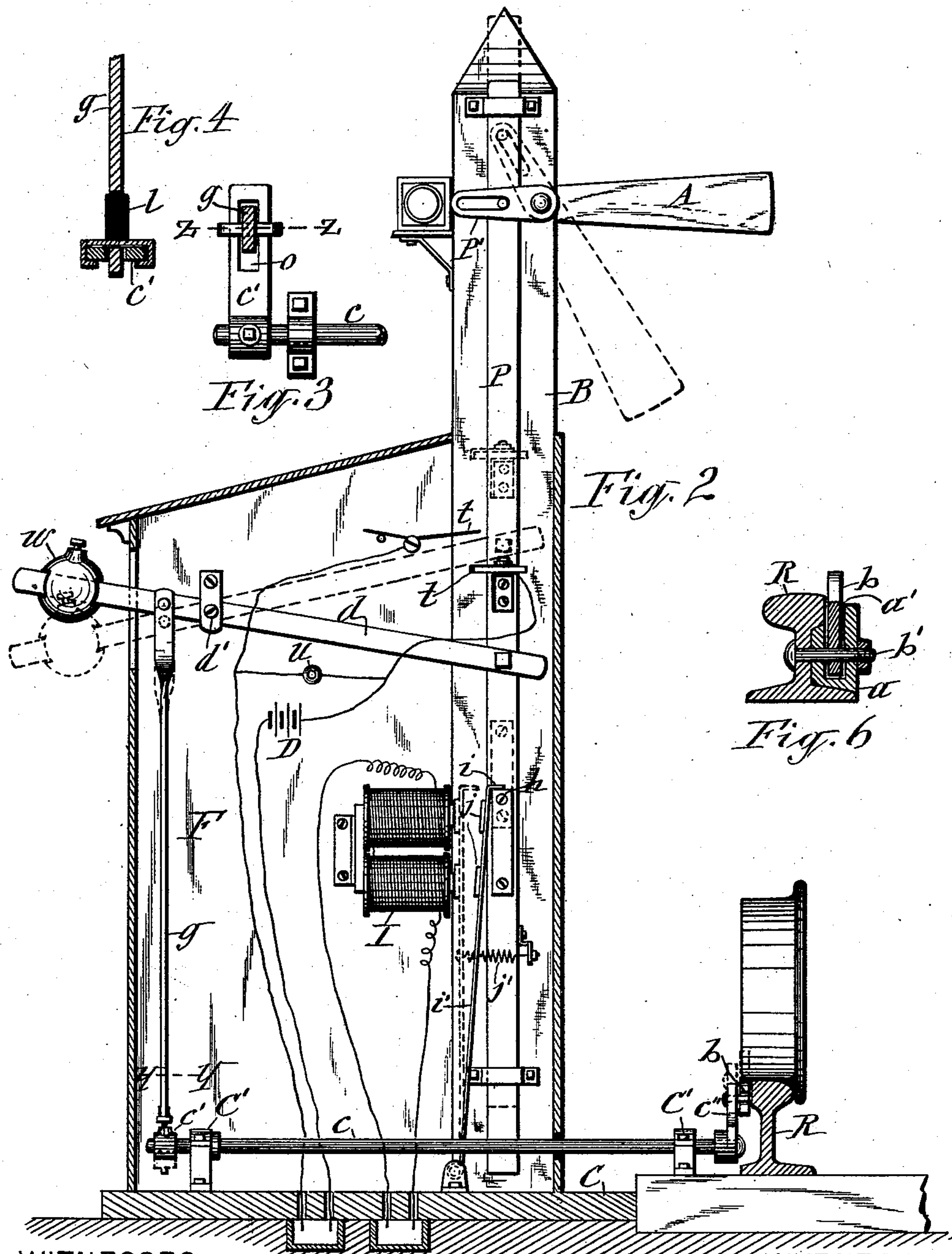
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UNITED STATES PATENT OFFICE.

WILLIAM BERRIGAN AND WILLIAM H. MCCLURE, OF ELMIRA, NEW YORK.

RAILWAY BLOCK-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 532,633, dated January 15, 1895.

Application filed September 18, 1894. Serial No. 523,358. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BERRIGAN and WILLIAM H. MCCLURE, of Elmira, in the county of Chemung, in the State of New York, have invented new and useful Improvements in Railway Block-Signals, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of railway block signal systems in which the semaphores are set to automatically indicate danger by means of mechanisms actuated by an instrument placed by the side of the track-rail so as to be traversed and depressed by the wheels of the cars and engine passing the semaphore; and the invention consists in a novel organization of the aforesaid mechanisms combined with electrically controlled devices for temporarily retaining the semaphore in position to indicate danger while the train of cars or engine is passing over the block as hereinafter more fully described and specifically set forth in the claims.

In the annexed drawings Figure 1 is a plan view of two blocks of a railway equipped with our improved automatically operated semaphores. Fig. 2 is an enlarged vertical transverse section on line —X—X— in Fig. 1 showing the mechanical and electrical devices for operating the semaphores. Fig. 3 is a horizontal transverse section on line —Y—Y— in Fig. 2. Fig. 4 is a transverse section on line —Z—Z— in Fig. 3. Fig. 5 is a side view of the track-instrument, and Fig. 6 is an enlarged transverse section on line —O—O— in Fig. 5.

Similar letters of reference indicate corresponding parts.

—R— represents one of the rails of one of the tracks of the road. —A—A—A— represent three semaphores for guarding two blocks of said track. Said semaphores are of the usual form, consisting of arms pivoted to tall posts —B— so as to swing from a suspended to a horizontal position, which positions indicate respectively safety and danger over the block of track in front of the semaphore.

For operating the semaphores automatically, we employ opposite each one of them, a track-instrument or track-lever —b— and mechanisms for transmitting motion from

said lever to the semaphore-arm —A—. The track-instruments we prefer to form of a lever about twelve feet more or less in length extending along the outer side of and contiguous to the track-rail —R— and pivoted at one end to oscillate vertically and connected at the opposite end to the mechanism which transmits motion to the semaphore as herein- after described. To obviate weakening the rail, we connect the lever —b— to the rail by placing against the outer side of the stem of the rail, the cheek-block —a— which bears on the flange and under side of the head of the rail and is of sufficient length to brace the rail as shown in Figs. 5 and 6 of the drawings. This cheek-block is provided with a longitudinal slot —a'— in which the heel of the lever is inserted. A bolt —b'— passes transversely through said cheek-block, lever and rail and serves to pivot the lever and to secure the aforesaid parts to the rail.

From the side of the track extends at right angles a sill —C— and to this sill and to the cross-tie —T— are secured pillow-blocks —C'— —C'— supporting a horizontal rock-shaft —c—. To the end of this shaft adjacent to the rail —R— is fastened an arm —c''— upon which rests the forward and vibratory end of the track-lever —b— which normally projects slightly above the plane of the track so as to be depressed by the wheels of the engine and cars passing the semaphore. To prevent the said lever from rebounding from the arm —c''— when released from the pressure of the wheels we provide said arm with an upwardly projecting ear —e— and connect the lever to the arm by a pin or bolt —f— passing through said ear and through a longitudinal slot —e'— in the lever. The strain exerted on the rock-shaft by the mechanisms deriving motion therefrom causes the arm —c''— to support the lever —b— so as to project slightly above the rail —R— as aforesaid. The motion transmitted to the arm —c''— is increased by the sagging of the rail —R— incident to the weight traveling over it. To the rock-shaft —c— is also attached another arm —c'— which by a rod —g— is connected to a lever —d— pivoted at —d'— to a suitable rigid support —F—.

The connection of the rod —g— to the lever —d— is at one side of the pivot of the lat-

ter, and the opposite end of said lever is connected to a pitman —P— connected to a crank —P'— attached to the shaft of the semaphore-arm —A—.

5 A weight —w— is adjustably connected to the same arm of the lever —d— to which the rod —g— is connected, which weight produces an upward force on the pitman —P— to automatically swing the semaphore-arm —A—
10 into a suspended and normal position as indicated by dotted lines in Fig. 2 of the drawings.

Each block of the signal system is provided with a separate electric circuit in which —D—
15 denotes the battery.

The pitman —P— of each semaphore has attached to it one of the terminals —t— of a circuit controller or circuit maker and breaker, and in the path of the aforesaid terminal is
20 the other terminal —t— of the circuit in the block immediately back of the semaphore. Each pitman is also provided with a suitable shoulder or catch —h— which becomes engaged with a detent or hook —i— on an arm
25 —i'— pivoted to the post —B— or other suitable support, and is drawn toward said catch by a spring, j'. Opposite the engaging end of the aforesaid arm are electro magnets —I— connected to the circuit in the block
30 immediately in front of the semaphore. The armature —j— of said magnets is attached to the free end of the arm —i'— so that the attraction of the armature by the magnets draws the detent out of engagement with the
35 shoulder or catch —h—, as represented by dotted lines in Fig. 2 of the drawings.

The operation of our described automatic block signal is as follows: As the engine or train of cars pass one of the semaphores the
40 wheels traversing the track-lever —b— depresses the same and causes the arms —c'— to rock the shaft —c—, the motion of which draws down the pitman —P— by means of the arm —c'—, rod —g— and lever —d—. The downward draft of the pitman swings the semaphore-arm —A— into a horizontal position as shown by full lines in Fig. 2 of the drawings, said position of the semaphore indicating danger over the block which the train
50 or engine is entering. The magnets —I— at said semaphore being in the circuit which is controlled by the circuit making and breaking terminals —t—t— at the next semaphore which terminals are out of contact and at rest
55 liberates the armature of the aforesaid magnets and causes said armature to throw the detent —i— into engagement with the shoulder or catch —h— on the pitman —P— and thereby retain the semaphore in its aforesaid
60 horizontal position until the train or engine passes the next semaphore which is then set into a position to indicate danger in the manner before described, and in this action the downwardly moving pitman —P— brings the
65 two terminals —t—t— thereat into contact and thereby closes the circuit in the block just left by the train or engine. The closing

of this circuit energizes the magnets —I— at the semaphore at the rear end of the block and thus causes the armature of said magnets
70 to draw the detent —i— out of engagement with the shoulder —h— and thereby allows the semaphore-arm —A— thereat to drop into a suspended position to indicate that the block between said two semaphores is clear
75 and safe.

In order to allow the semaphore at the rear of the train to be set to indicate safety after the engine or train has passed over the block and run onto a siding without passing over a
80 track-instrument, we provide a push-button —U— accessible by a person to press on said button and thereby close the circuit.

To guard against serious concussion of the mechanisms which transmit motion from the
85 track-instrument to the semaphore, we provide the rod —g— with a cushion —l— of rubber or other suitable material at its connection with the arm —c'— as shown in Fig. 4 of the drawings, and in order to allow the
90 mechanisms to be adjusted so as to prevent the track-instrument from being actuated by hand-cars or other weights lighter than train-cars we connect the rod —g— to the arm
95 —c'— adjustably in its distance from the rock-shaft —c— and thereby regulate the leverage of said arm so as to require the weight of an ordinary car or engine to depress the track-lever —b—. Said adjustability is illustrated in Fig. 3 of the drawings and consists
100 of the slot —o— through which the rod —g— passes, said slot being of sufficient length to allow the rod to be shifted toward and from the rock-shaft —c— as may be required for
105 the purpose aforesaid.

What we claim as our invention is—

1. A railway block signal system having a separate electric circuit in each block, pitmen connected to the semaphores, levers connected at one end to the pitmen, track-instruments
110 actuating the levers, stops on the pitmen, detents automatically engaging the stops and thereby retaining the semaphores set to danger, magnets at the semaphores, armatures drawing the detents out of engagement by
115 energy of the magnets, and circuit-closers at each semaphore in circuit with the magnets at the next semaphore at the rear and actuated by the pitmen as set forth.

2. In a railway block signal system, the
120 combination with the two semaphores of a block, of a track-instrument opposite each semaphore to be actuated by the passing train or engine, a pitman connected to each semaphore, a lever pivoted to a fixed support and
125 connected at one end to the pitman, a weight attached to the opposite end of said lever, a rock-shaft having two arms connected respectively to the track-instrument and to the aforesaid lever, an electric circuit exclusively for
130 the block between the aforesaid semaphores, electro-magnets at the rear semaphore of the block, the armature provided with a hook, a catch on the pitman receiving said hook when

the pitman is moved to set the semaphore to danger and the armature released from the magnet, an electric terminal carried on the pitman of the front semaphore of the block, 5 and a terminal traversed by the aforesaid terminal to make and break the circuit during the movement of the pitman substantially as described and shown.

3. In combination with the track-rail, semaphore and its actuating lever —*d*— the rock-shaft —*c*— at right angles to the track-rail and having the arms —*c'*— and —*c''*— extending in opposite directions from said shaft, the rod —*g*— connected to the aforesaid lever and to 15 the arm —*c'*— adjustably in its distance

from the rock-shaft, the ear —*e*— on the arm —*c''*—, the lever —*b*— pivoted at one end to the side of said rail and having its opposite end provided with a longitudinal slot —*e'*— and the pin —*f*— passing through said ear and 20 slot as described and shown.

In testimony whereof we have hereunto signed our names this 4th day of August, 1894.

WILLIAM BERRIGAN. [L. S.]
WILLIAM H. McCLURE. [L. S.]

Witnesses:

L. A. BAKER,
H. H. MURPHY.