



No. 700,240.

Patented May 20, 1902.

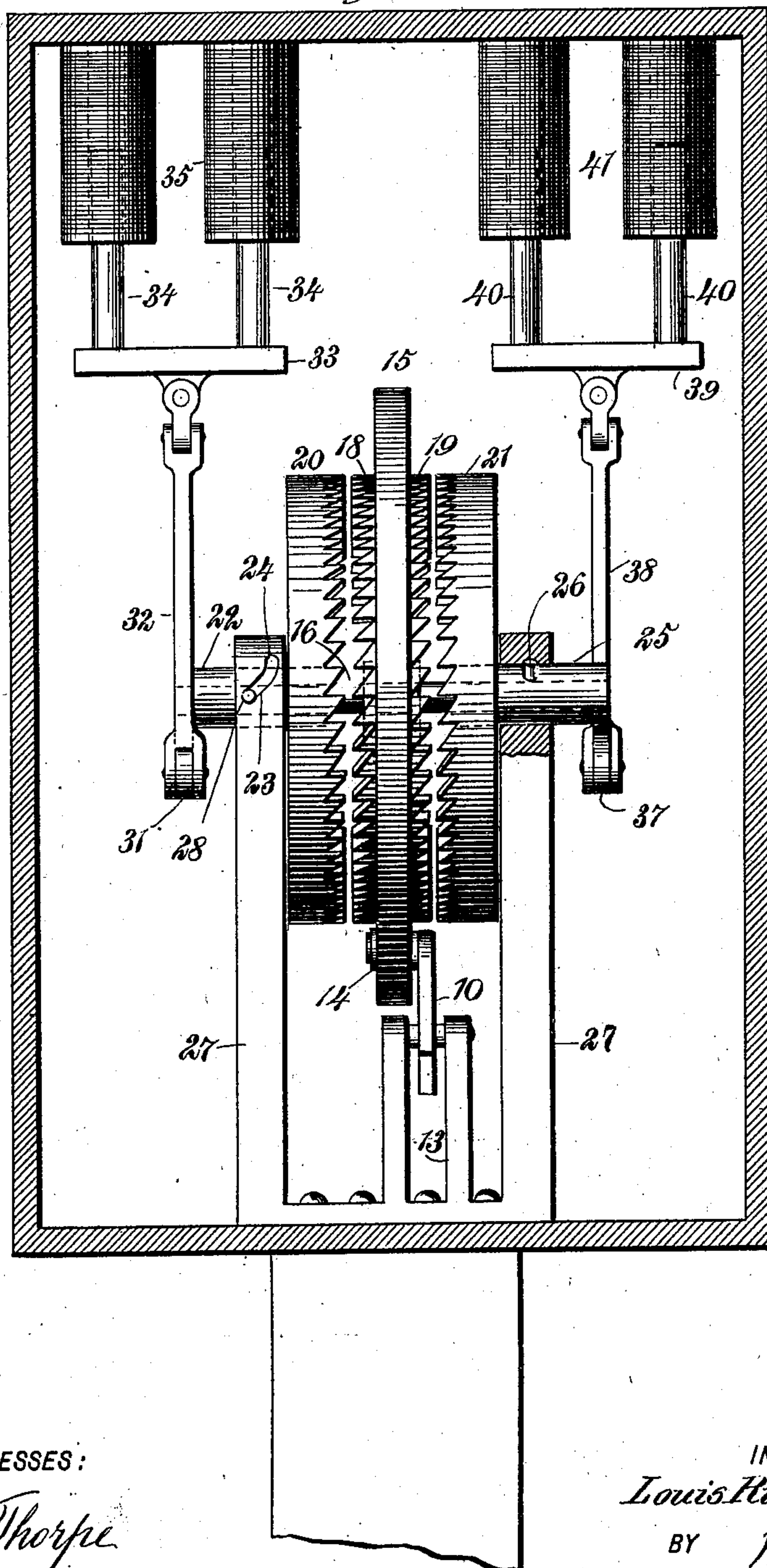
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BLOCK SIGNAL SYSTEM.

(Application filed July 24, 1901.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 4,



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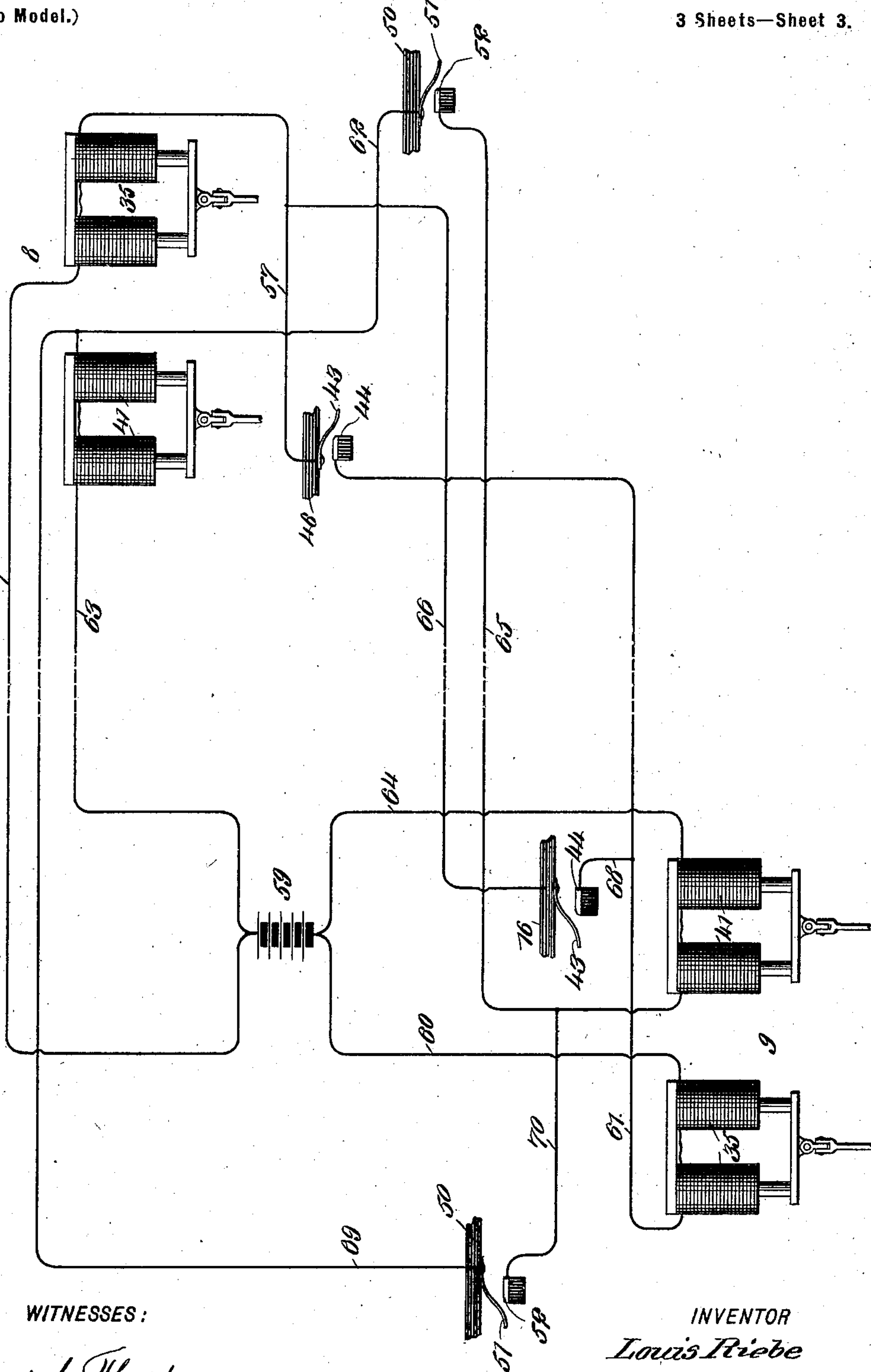
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Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## BLOCK-SIGNAL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 700,240, dated May 20, 1902.

Application filed July 24, 1901. Serial No. 69,519. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS RIEBE, a citizen of the United States, and a resident of Lansford, in the county of Carbon and State of Pennsylvania, have invented new and useful Improvements in Block-Signal Systems, of which the following is a full, clear, and exact description.

This invention relates to improvements in electrically-controlled block-signal systems particularly adapted for street-railways or roadways having a single track with switches or turnouts at suitable intervals; and the object is to provide a simple mechanism for this purpose in which a car in leaving a switch or turnout will close the circuit to said signals at each end of the block, thus indicating to the motorman of a following car or of an approaching car that a car is running on a main track between the switches, and, further, so constructing the parts that the car upon leaving the main track or opposite end of the block will cause the signals to be reset to "safety."

I will describe a block-signal system embodying my invention, and then point out the novel features in the appended claims.

Figure 1 is a plan view of the railway-track, showing a block-signal system embodying my invention. Fig. 2 is a section on the line 2 2 of Fig. 1, showing one of the signals with the casing in section. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 2, and Fig. 5 is a diagrammatic view of the system.

Referring to the drawings, 5 designates the main track, 6 indicating a switch or turnout at one end of the block, and 7 a switch or turnout at the opposite end of the block. Arranged at the turnout 6 is a signal 8, while a signal 9 is arranged at the turnout 7, these signals or the mechanism for operating the same being alike, and a description of one will answer for both.

Referring to Fig. 2, I have shown the signal as consisting of a semaphore 10, having one end extending into a casing 11, mounted on a standard 12, and the inner end of this semaphore is pivoted to a standard 13 in the casing. The end of the signal inwardly of its pivot-point is provided with a roller 14,

designed to be engaged against the periphery of an actuating-wheel 15; mounted to rotate freely on a shaft 16. This wheel is provided with a notch 17, into which the roller 14 engages when the semaphore is in its lowermost or safety position. One wall of this notch, it will be noticed, is cam-shaped or inclined, so as the wheel rotates the roller 14 may ride upon said incline to engage with the periphery of the wheel.

The wheel 15 is provided on its opposite sides with circular rows of ratchet-teeth 18 and 19, the teeth being extended in opposite directions. The ratchet-teeth 18 are designed to be engaged by the ratchet-teeth upon a propelling-wheel 20, mounted to rotate on the said shaft 16, and also having a movement longitudinally of said shaft. The ratchet-teeth 19 are designed to be engaged by the ratchet-teeth on a wheel 21, which is also mounted to rotate on the shaft and to have longitudinal movement thereon.

On the hub portion 22 of the wheel 20 is a pin 28, passing into a cam-slot 23, which communicates with a slot 24, extending in the circumferential direction of said wheel 20, and on the hub 25 of the wheel 21 is a pin 26, passing into a cam-slot similar to the slot 23 24. These slots are formed in the supporting-pilars 27.

From an arm 31 on the hub 22 a draw-rod 32 extends upward to a pivotal connection with a cross-head 33, connecting the cores 34 of a solenoid 35. From the hub 25 an arm 37 extends, and a draw-rod 38 is connected at its lower end to said arm 37 and at its upper end to a cross-head 39, attached to the cores 40 of a solenoid 41.

The arms 31 and 37 extend in opposite directions one relatively to the other. The solenoid 35, which operates the arm 31, will be termed the "signal-setting" or "danger" solenoid, while the solenoid 41 is the "safety solenoid"—that is, it operates to return the signal to safety position.

Arranged at the junction of the turnouts with the main track are circuit-closing devices, both for closing the circuit to turn the signal to "danger" and for closing the circuit to cause the signal to return to "safety."

The "danger" circuit-closing device consists



of a slide-bar 42, arranged transversely of the track and having a spring-finger 43, adapted to engage with a fixed contact 44. The bar 42 is connected by means of a post 45 with a rod 46, mounted at one end to slide in a post 47 and engaging at the other end with a movable section 48 of one of the main-line rails. It will be here stated that at this point the section 48 of the rail will be closer to the opposite rail than the distance between the fixed portions of opposite rails, so that a car passing along the main track and entering the block will move said movable section 48 over against the adjacent track-rail and during this movement close the circuit between the points 43 and 44. After thus closing the circuit and passing the circuit-closure a spring 49, arranged between the upright 47 and a collar on the rod 46, will move the bar 42 in a direction to open the circuit.

As a means for closing the circuit to set the signal to "safety" I employ a circuit-closure at each switch, consisting of a bar 50, carrying the spring-yielding contact 51, adapted to engage with a fixed contact 52, and this bar 50 is connected by means of a post 53 with a rod 54, mounted to slide through a post 55 and connecting at its opposite end with a yielding section 56, arranged adjacent to one of the track-rails. In the closing of this switch a car in passing will engage the flanges of its wheels at one side against the inner surface of the movable part 56, which will cause the bar 50 to be moved to close the circuit.

From the contact 43 at the signal 8 a wire 57 leads through the solenoid 35. From the other end of the solenoid a wire 58 extends to and connects with one pole of a battery 59, from the other pole of which a wire 60 leads to one end of the solenoid of signal 9, and from the other end of this solenoid a wire 61 leads back to the contact 44, which coacts with the contact 43. From the contact 51 a wire 62 leads to one end of the solenoid at signal 8, and from the other end of this solenoid a wire 63 leads to the battery 59, from which a wire 64 leads to one end of the solenoid-winding 41 at signal 9, and from the other end of said winding a wire 65 leads back to the contact 52, coacting with the contact 51. From the contact 43 at the signal 9 a wire 66 leads to and connects with the wire 57, and thence passes through the solenoid 35 at signal 8, the wire 58, the battery 59, through the wire 60, the solenoid 35, and thence through the wire 61 and the wire 68 to the contact 44. From the contact 51 at signal 9 a wire 69 leads to and connects with the solenoid 41 at signal 8, and the current passes thence through the wire 63 and battery 59 and wire 64 and solenoid 41 at signal 9, a portion of the wire 65, and through the wire 70 to the contact 52, coacting with the contact 51.

In operation, assuming a car to be run on the main track and passing the signal 8, the car will close the circuit through the contacts 43 and 44, which will energize the solenoids

35 at each end of the block, and these solenoids by drawing upward the cores will cause a rotary movement of the wheel 20, while the pin 28 will cause the said wheel to move toward and engage the ratchet-teeth 18, so that by a continued rotary movement of said wheel 20 the wheel 15 will be rotated, causing the semaphore to swing upward, as heretofore described. As the car passes out of the block at signal 9 the flanges of one of its wheels by engaging the movable rail-section or device 56 will close the circuit through the contacts 51 and 52 at both ends of the block, and thus the solenoids 41 at the ends of the block will energize, causing the teeth of the wheel 21 to engage with the ratchet 19 of the wheel 15, so that said wheel 15 will be reversed and returned to normal position, permitting the roller 14 to move into notch 17, thus permitting the semaphore to drop to "safety" by gravity. Obviously as the solenoids are deenergized the cores will drop by gravity, causing the movable ratchet-toothed wheel to return to normal position.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a signal system, a signal-controlling wheel, another wheel having a movement into and out of operative connection with the first-named wheel, an electric device for causing the movements of said second-named wheel, an electric circuit in which the electric device is arranged, and a circuit-closer therefor, substantially as specified.

2. In a block-signal system, a semaphore, a wheel with which the semaphore connects, ratchet-teeth on said wheel, a ratchet-wheel mounted to rotate on the shaft of the first-named wheel and to move longitudinally of said shaft, an electric device for causing the movements of said ratchet-wheel to engage the teeth of the first-named wheel, an electric circuit in which said electric device is arranged, and a circuit-closer therefor, substantially as specified.

3. In a block-signal device, a semaphore, a wheel for operating said semaphore, the said wheel being provided with a notch in its periphery, ratchet-teeth on opposite sides of said wheel, a shaft on which the wheel is mounted, ratchet-wheels mounted to rotate on said shaft and also having a longitudinal movement thereof, the said ratchet-wheels being at opposite sides of the first-named wheel, and adapted to engage with the ratchet-teeth thereof, solenoids, cores for said solenoids, connections between said cores and the ratchet-wheels, and electric circuits in which the solenoids are arranged, and circuit-closers operated by a car for closing the circuits, substantially as specified.

4. In an electrically-controlled block-signal system, signal devices at the ends of the block, and electric motors for causing movement of said signal in one direction, an electric circuit in which said motors are ar-



ranged, and circuit-closers at each end of the  
block, each circuit-closer consisting of a part  
adapted to be engaged by a flange of a car-  
wheel, a contact movable with said part, and  
5 a fixed contact with which the first-named  
contact is designed to engage, substantially  
as specified.

In testimony whereof I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

LOUIS RIEBE.

Witnesses:

JOHN GLUCK,  
NATHAN TANNER.