

No. 760,081.

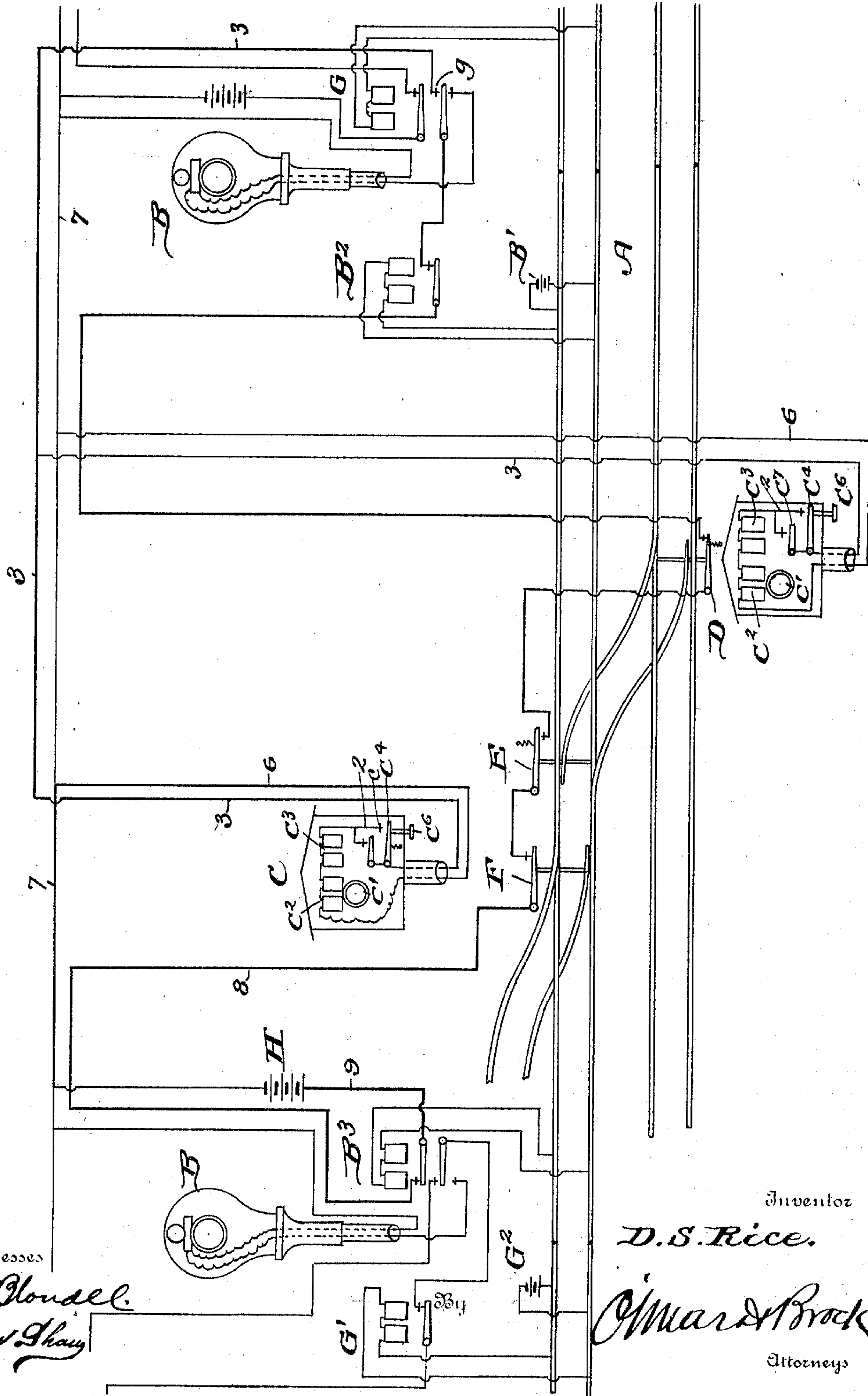
PATENTED MAY 17, 1904.

D. S. RICE.
AUTOMATIC SWITCH INDICATOR.
APPLICATION FILED DEC. 24, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

M. B. Donald.
James Shaw

Inventor

D. S. Rice.

J. Ward Brock
Attorneys

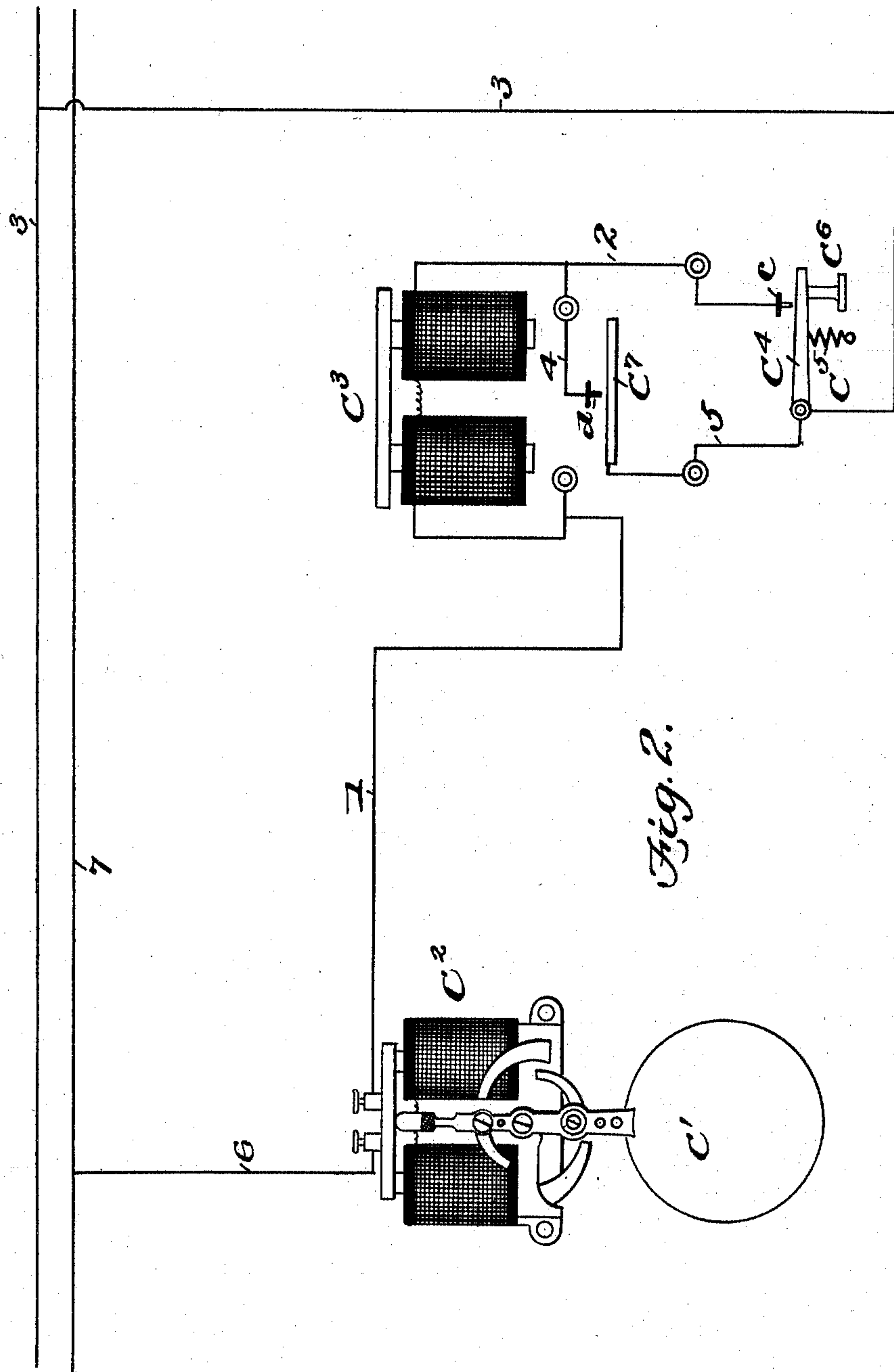
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Inventor

D. S. Rice.

By

James H. Brock
Attorney

Witnesses

Wm. Blonay
Charles Shaw

UNITED STATES PATENT OFFICE.

DEWEY SERENO RICE, OF WEATHERLY, PENNSYLVANIA.

AUTOMATIC SWITCH-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 760,081, dated May 17, 1904.

Application filed December 24, 1903. Serial No. 186,423. (No model.)

To all whom it may concern:

Be it known that I, DEWEY SERENO RICE, a citizen of the United States, residing at Weatherly, in the county of Carbon and State of Pennsylvania, have invented a new and useful Improvement in Automatic Switch-Indicators, of which the following is a specification.

My invention relates to a device to be used in connection with railroad switch-indicators, the object being to receive the indication of an approaching train at any time and to prevent useless exhaustion of the batteries when such indication is not desired, also the arrangement of a plurality of such indicators on a block each independent of the other.

My invention consists of the novel features of construction and combination of parts hereinafter described, particularly pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a diagrammatic view of a switch-indicating system having my improvement applied thereto. Fig. 2 is an enlarged diagrammatic view of my improvement and parts adjacent thereto.

My improvement is designed to be applied to an electrical signaling system now in use; and it consists, essentially, of an electromagnet, an armature normally held away from the magnet by a spring or other suitable means, contact-points, a manually-operated circuit-closer normally held so that the circuit is open, the armature being drawn toward the magnet and held when the circuit is closed, even after the circuit-closer has resumed its normal position, until the circuit is broken by the approach of a train or the opening of a switch.

To fully understand the use and operation of this device, it will be necessary to briefly describe the signaling system with which it is to be used.

Referring to Fig. 1, A represents a double track divided into blocks. Adjacent the end of each block is arranged a semaphore B, electrically controlled. Along the block is arranged a plurality of indicators C, normally indicating "danger." In the diagram is shown a crossover between the two tracks and the entrance to a siding leading from the main track. D, E, and F represent switch instru-

ments, which consist of a circuit-closer having an arm attached to the switch in such manner that when the switch is closed, so that a train can enter same, the circuit is also closed and that when the switch is open the circuit is broken. The semaphore B on the right-hand side governs that part of the track shown between the semaphores, this length representing one block. B' is a battery located at any convenient point on the block, and included in the circuit of this battery are the relays B² and B³, arranged at opposite ends of the blocks, the rails of one of the tracks being also included in the circuit. I have shown batteries and complete circuits for one of the two tracks only, as the arrangement for the other track would be practically a duplicate. The relay G, at the right of relay B², belongs to the adjoining block, while the relay G' is in circuit with battery G² in the block to the left of the diagram. Should a train enter the block shown on the right, the wheels of the train would short-circuit the relay G, and its double armature would drop, thus opening the circuits at the contact-points of the G, relay-armature, said circuits being shown closed in the drawings, thereby indicating a clear track on the block to the right; but the lower portion of armature on the relay G would close the circuit including battery H and relays B² B³ and the semaphore-disk B on the right. While the armature at G is maintaining this lower contact the indicators C are cut out of circuit.

Referring now more particularly to Fig. 2, the indicator-disk C' is actuated by the electromagnets C² by means not a part of my invention and not necessary to describe. In the casing containing the indicator I place my improvement, which is arranged in the circuit leading to the electromagnet C². My improvement consists of the electromagnets C³, connected by the wire 1 to the magnet C² and by wire 2 to the contact-point c. This point is adapted to be engaged by a pivoted switch C⁴, normally held away from the point c by a spring C⁵ and having attached to its free end a push-rod C⁶, which projects from the casing and by means of which the said switch is forced into contact with the point c. Connected to the pivotal point of the switch is a wire 3, which runs to the contact-point g of the lower

armature of the relay G. Adjacent the magnets C^3 is arranged a pivoted armature C^7 , adapted when attracted by the magnets to contact with the contact-point d . A wire 4 connects the point d to the wire 2, and a wire 5 connects the armature C^7 to the wire 3 at its juncture with the armature C^4 . The electromagnet C^2 is connected by a wire 6 with the line-wire 7.

10 The operation and use of my device is as follows: When an indication is wanted as to the condition of the track, the rod C^6 is pressed, closing the circuit through the armature C^4 and contact-point c , and the magnet C^3 will at
15 once, if energized, attract the armature C^7 . When the push-rod C^6 is released and the armature C^4 is drawn by the spring into its normal position, the circuit established is not broken, but is automatically continued through
20 the wires 5, armature C^7 , wire 2, and on through the magnet as at first. In Fig. 1 the circuit thus completed is shown in heavy lines and may be briefly traced as follows: battery H, wire 7, wire 6, electromagnet C^2 , wire 1, mag-
25 net C^3 , wires 2 4 5 3 in the order named, relay-G armature, (lower arm,) relay B^2 , switches D E F, and through wire 8 to relay B^3 and back to battery H through wire 9. It is now obvious that if a train should approach on the
30 block to the right the short-circuiting of the battery on that block and the fall of the armature-arm in the relay G will break this circuit or that the opening of any of the switches will break it, and, furthermore, that if a train
35 were approaching or a switch was open when the rod C^6 was pressed no circuit would be completed, and consequently the pressing of the rod would have no effect on the disk signal C^1 , which normally indicates "danger," and
40 hence the signal could not be cleared. When the rod C^6 is lifted or pressed upward and a circuit is established, the disk is cleared—that is, it is actuated so as to indicate a clear track—and the action of the armature C^7 holds the
45 disk in that position until a train approaches or a switch is turned. It is understood that the indicator is set for "danger" when the circuit is open. A clearing of the track, however, does not set the signal from "danger" to
50 "clear" unless it is desired to know the condition of the track on the adjacent block and of the switches on the block along which the indicator is placed, so that unnecessary use of the batteries is avoided.

55 In this description I have traced in detail the circuit from the indicator approximately near the center of Fig. 1.

It is understood that as many indicators may be used along a block as desired, all independent of each other, so that the condition of the tracks may be ascertained from
60 numerous points. This will explain the advantage of saving the battery, as a block might be clear for several hours out of twenty-four
65 and a particular indicator not be consulted

during that particular time, during which time the battery in circuit with it would be cut out of circuit and at rest.

As the indicator is normally at "danger" before crossing over to the main track or leaving a siding, a trainman to secure a clear signal must walk to the indicator arranged adjacent that crossover or siding and press the rod C^6 . If the track is clear, he will get a clear signal, and it will be particularly noticed that
70 he must do this before he throws open his switch, as he could not otherwise get a clear signal. This obviates the danger of his opening the switch first and forgetting to close it
75 if he gets a danger-signal or of his opening the switch in front of an approaching train and not having time to close it after getting the danger-signal. It will also be obvious that my device can be used in connection with
80 other switch-signals, such as those using motors to operate signal-arms, &c., as well as with the system shown and described for illustrative purposes.

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

1. In combination with an indicator, an electromagnet arranged in the indicator-circuit, a switch, means for normally holding the switch open, an armature adapted to be attracted to
95 the magnet when the switch is closed temporarily and to complete the circuit through the magnet until it is broken from a point other than the switch mentioned.

2. The combination with a signal system
100 comprising circuit-wires leading to an indicator, an electromagnet arranged in said circuit, a switch arranged in the circuit, a spring adapted to hold the switch normally open, an armature adapted to be drawn toward the mag-
105 net when the switch is closed, a contact-point adapted to be engaged by the free end of the armature when drawn toward the magnet, a wire leading from said contact-point and tapping the circuit-wire between the magnet and
110 the switch, and a wire leading from the circuit-wire on the opposite side of the switch to the pivoted end of the armature, as and for the purpose described.

3. The combination with a signal system nor-
115 mally showing a danger-signal when the circuit is open and to show a clear signal when the circuit is closed, means for holding the circuit normally broken and for closing same temporarily, an electromagnet adapted to attract an
120 armature and hold the circuit normally closed through said armature and magnet when the normally open circuit has been closed temporarily until the said circuit is broken by the approach of a train or the opening of a switch
125 when the circuit again becomes normally open.

DEWEY SERENO RICE.

Witnesses:

GEO. F. ULSHAFFER,
AARON RUCH.