

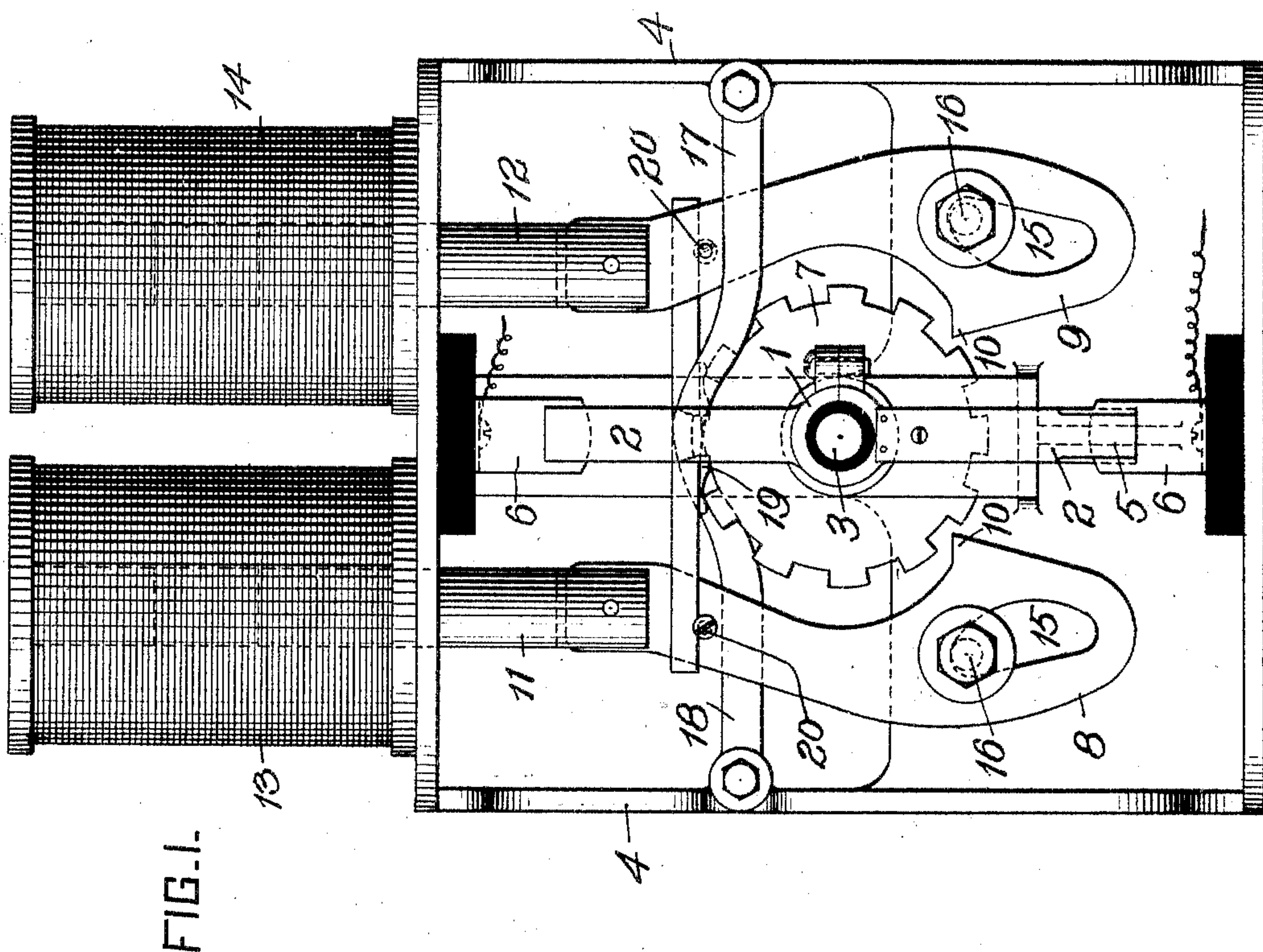
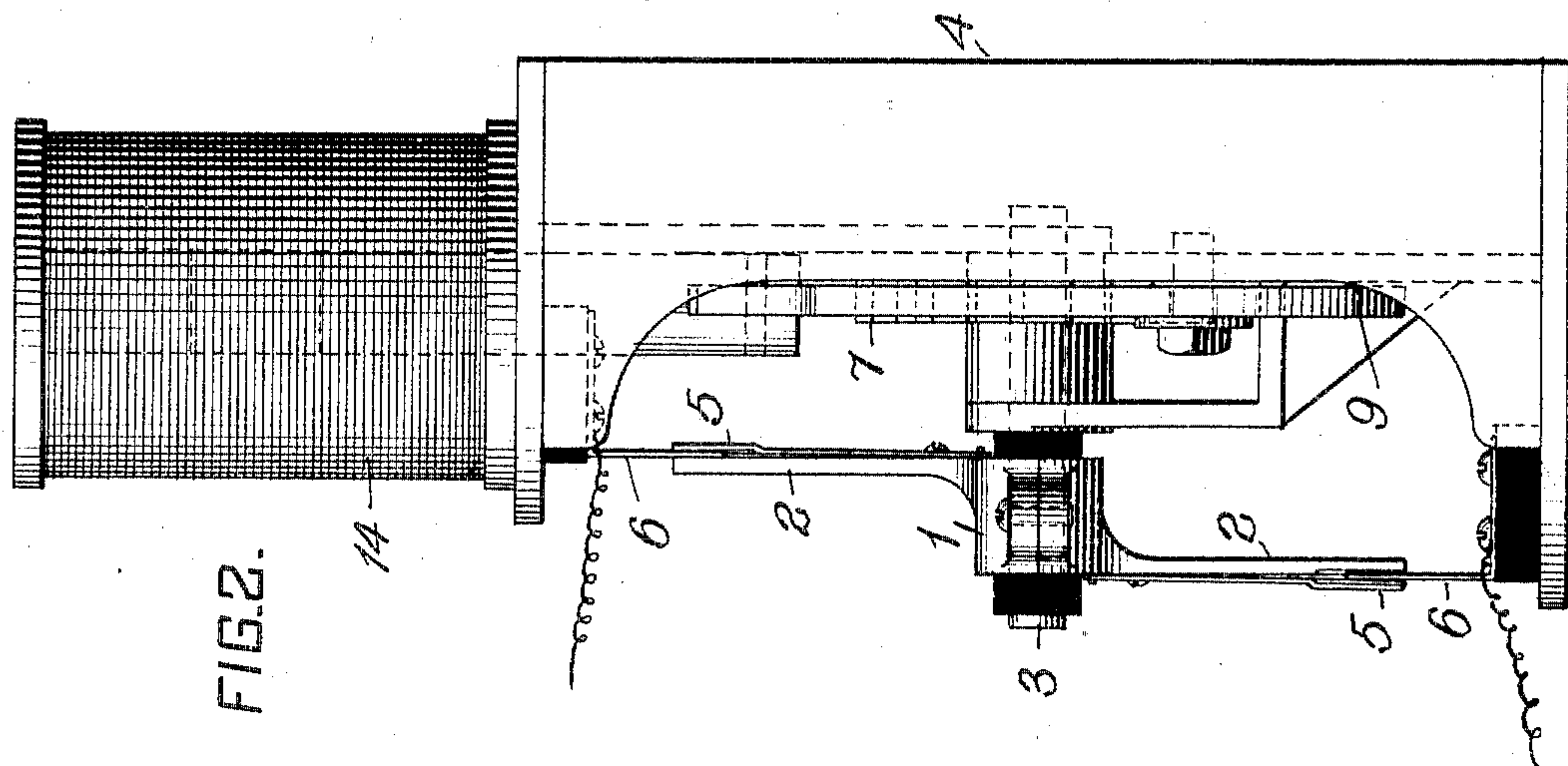
No. 776,970.

PATENTED DEC. 6, 1904.

J. C. WALDO.
CIRCUIT CHANGER.

APPLICATION FILED OCT. 19, 1903.

NO MODEL.



WITNESSES:

Herbert Bradley
R. H. Kirchner

INVENTOR

James C. Waldo
by Christy and Christy
Att'ys

UNITED STATES PATENT OFFICE.

JAMES C. WALDO, OF SHARPSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO JOHN J. FORSTER, OF AVALON, PENNSYLVANIA.

CIRCUIT-CHANGER.

SPECIFICATION forming part of Letters Patent No. 776,970, dated December 6, 1904.

Application filed October 19, 1903. Serial No. 177,684. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. WALDO, a citizen of the United States, residing at Sharpsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Circuit-Changers, of which improvements the following is a specification.

The invention described herein relates to electric make-and-break mechanism, and has for its object a construction whereby an electric circuit may be changed by the movement of an object, as a car, in one direction and will remain in such position during the movement of any desired number of objects or cars in the same direction, and, further, will not be restored to normal position until an equal number of objects or cars have moved in the opposite direction.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of my improved circuit-changer, and Fig. 2 is a side elevation of the same.

In the practice of my invention a hub 1, provided with arms 2, is secured to but insulated from a shaft 3, which is mounted in bearings on the supporting-frame 4. The arms are provided with contact-plates 5, adapted to engage complementary plates 6, which are mounted on blocks of insulating material and form terminals of the circuit to be controlled. The contact-plates 5 are electrically connected in any suitable manner, as by making the arms 2 of conducting material and electrically continuous. The rotation of the shaft 3 is effected by means of a toothed wheel 7, secured to the shaft, and heads 8 and 9, arranged on opposite sides of the wheel and each provided with a tooth 10 to engage the teeth of the wheel. These heads are pivotally connected to any suitable reciprocating mechanism and to the cores 11 and 12 of the solenoids 13 and 14. Suitable provision is made for causing the tooth 10 on the heads to engage the teeth on the wheel during the movements of the heads in one direction, as up, and to cause a disengagement during the

opposite movement, as down. A convenient construction to that end consists in forming inclined slots 15 in the heads and passing guide-pins 16 through the slots, as shown in Fig. 1.

When using my improvement for the operation of signals on electric railways, the signal, as a lamp, at one turnout, as B, is placed in or controlled by a circuit including the contacts 6. The circuits controlling the solenoids are controlled by make-and-break mechanisms at turnouts A and B. As a car passes from A onto the gauntlet leading to B the circuit of one of the solenoids 13 will be energized and the head 8 pulled up, thereby rotating the shaft 3 and shifting the arms 2 and changing the circuit of the signal at B, so as to indicate "danger" to a car moving toward A. If while the first car is moving toward B another car passes onto the gauntlet, solenoid 13 will be again energized and the arms 2 shifted one step farther in the same direction; but the signal at B, which was at "danger," will not be affected. As the first car passed onto the turnout at B the circuit of solenoid 14 will be energized, causing an upward movement of head 9 and a backward movement of the arms 2; but as the arms were shifted two steps forward the circuit controlling the signal at B will not be shifted to give a clear indication at B until the second car enters turnout B, and thereby through the described mechanism causing the arms 2 to move back the final step.

It will be understood that by suitably constructing the mechanism any desired number of cars may be permitted to pass in one direction before a reversal of the mechanism is effected by cars going in the opposite direction. It is characteristic of my improvement that when cars have passed in one direction a clear signal for cars in the opposite direction will not be given until all the first cars have passed a given point.

In order to lock the arms from overrunning, I provide retaining-pawls which consist of levers 17 and 18, provided with teeth 19. The lever 17 is arranged to be lifted by a pin 20 on the head 9, and the tooth 19 on said lever

is constructed to prevent any movement of the wheel 7 in the direction imparted by the head 9 until lifted by the head. The lever 17 operates in the same manner relative to the
5 head 8.

I claim herein as my invention—

In a circuit-changer the combination of a stationary contact, a shaft, a contact carried by the shaft, a ratchet-wheel mounted on said
10 shaft, reciprocating pawls arranged to engage

opposite edges of the ratchet, and positive locks operated respectively by the initial movements of the pawls, substantially as set forth.

In testimony whereof I have hereunto set
15 my hand.

JAMES C. WALDO.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.