

No. 661,195.

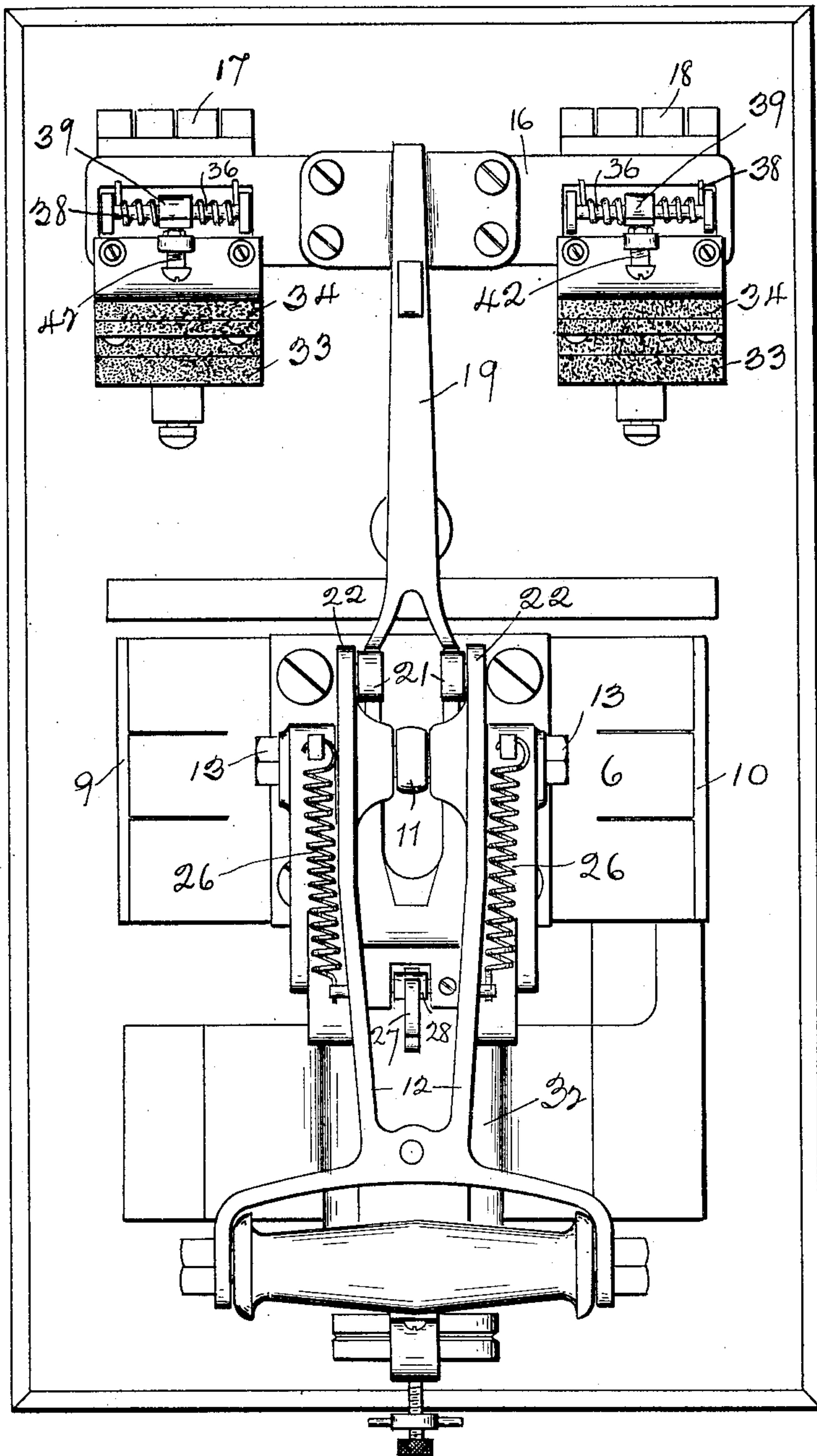
Patented Nov. 6, 1900.

W. M. SCOTT.
AUTOMATIC MAGNETIC CIRCUIT BREAKER.

(Application filed July 22, 1899.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:
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FIG 1

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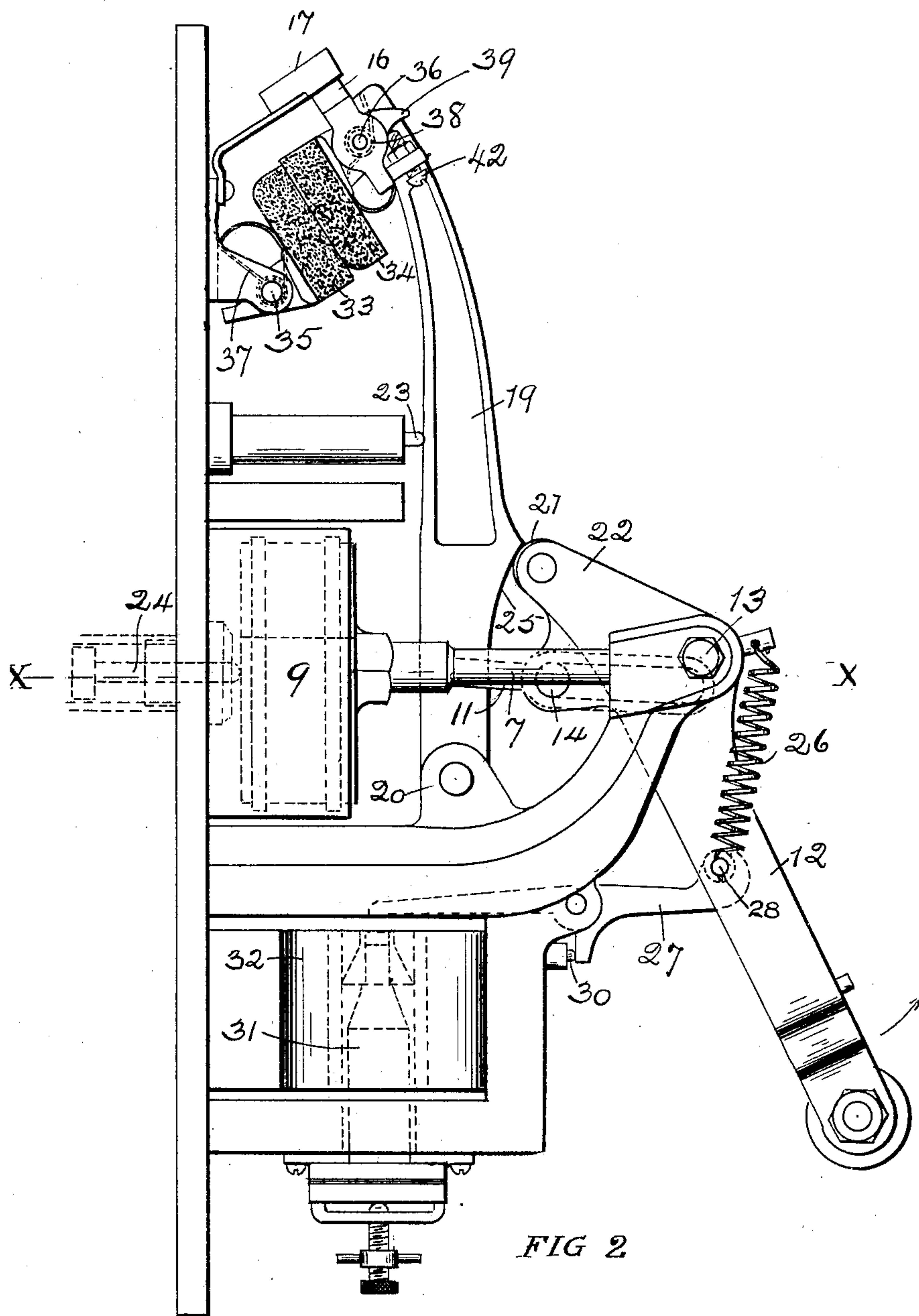
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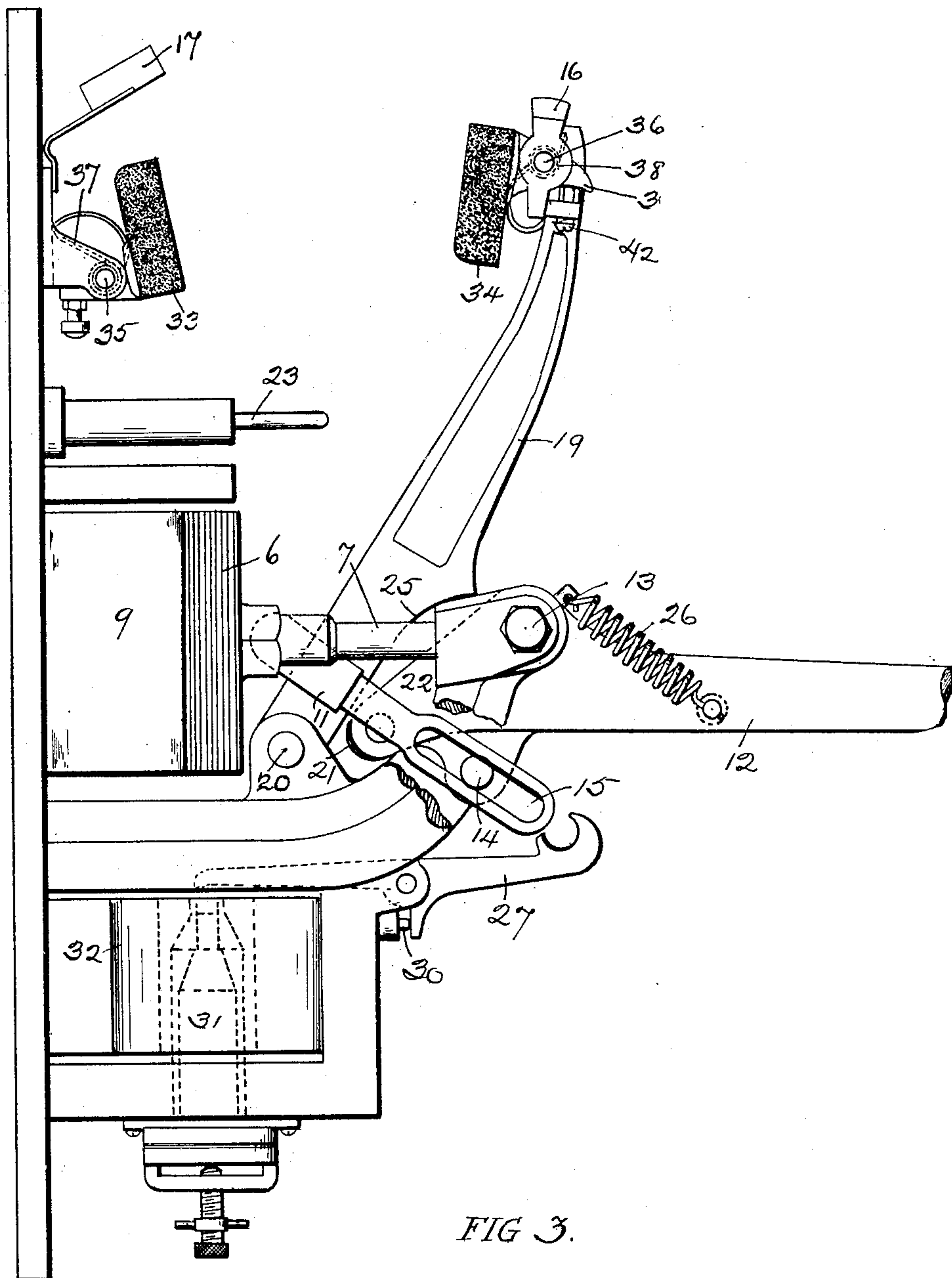
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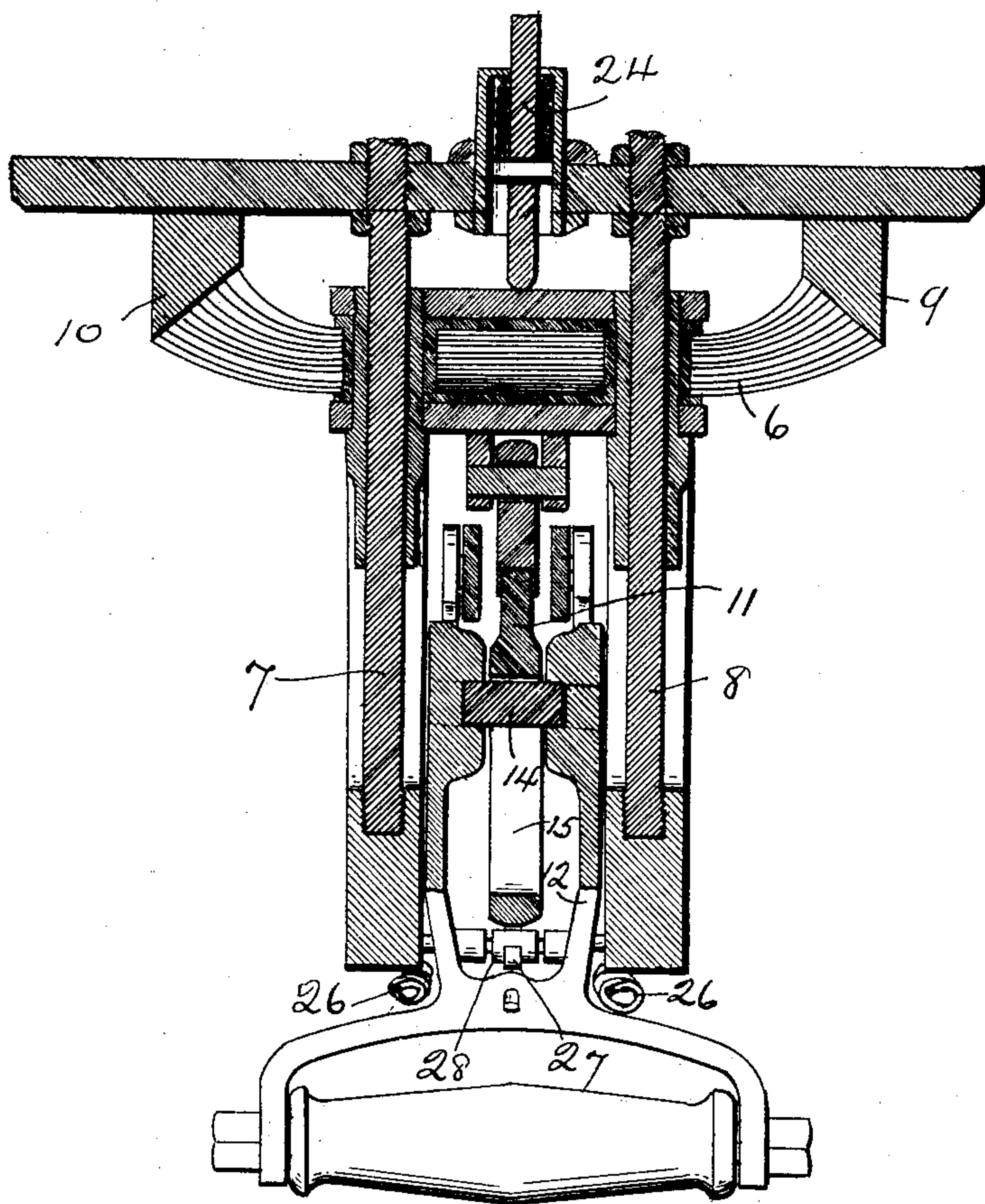


FIG 4

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UNITED STATES PATENT OFFICE.

WILLIAM M. SCOTT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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AUTOMATIC MAGNETIC CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 661,195, dated November 6, 1900.

Application filed July 22, 1899. Serial No. 724,750. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. SCOTT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Automatic Magnetic Circuit-Breaker, of which the following is a specification.

My invention relates to automatic magnetic circuit-breakers in which are provided an efficient main switch, a metallic switch supplemental and in shunt with the main switch, and improved carbon contacts for final break, and improved means for insuring the opening of the main switch prior to the opening of the shunt-switch and the closing of the main switch subsequent to the closing of the shunt-switch.

Referring to the drawings, Figure 1 is a front elevation of my device in the closed position. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of my device in the open position, with part broken away. Fig. 4 is a horizontal section on line *xx* of Fig. 2.

Similar numerals refer to similar parts throughout the several views.

The main switch 6 is movably mounted on the horizontal rods 7 and 8 and properly insulated therefrom and is adapted to cooperate with the fixed contacts 9 and 10 to make and break circuit. The rod 11 is pivotally secured to the switch 6 and constitutes one member of a toggle, the other member being the hand-lever 12, pivoted at 13 to a part of the framework of my device. The two toggle members are connected by means of the pivot 14, secured to the hand-lever 12 and passing through the slot 15 in the rod 11. This slot is adapted to permit of preliminary movement of the hand-lever 12 to cause the closing of a supplemental switch before the actuation of the main switch 6, as will be hereinafter described.

The movable bridge 16 and the fixed contacts 17 and 18, with which it is adapted to cooperate, constitute the supplemental switch in shunt with the main switch. Said bridge 16 is carried at the free end of the arm 19, which is pivoted at 20 (shown in Fig. 2) to the framework of my device.

The pivoted arm 19 is provided with cam

edges 25, adapted to cooperate with the anti-friction-rollers 21, secured to the projections 22 of the hand-lever 12. Said cam edges 25 are so disposed with respect to the rollers 21 that the operation of the hand-lever in one direction will cause the closing of the supplemental switch, while its operation in the other direction will permit the arm 19 to respond to the actuation of the spring-piston 23 (shown in Fig. 2) to cause the opening of the supplemental switch.

It will be noted that in moving the hand-lever 12 in the upward direction (indicated by the arrow in Fig. 2) the rollers 21 immediately begin to operate upon the cam edges 25 and cause the closing of the switch 16 before the pivot 14 has traveled the length of the slot 15 and caused the closing of the main switch 6. After the switch 6 is closed the remainder of the cam edges 25 (along which the rollers 21 must travel in completing the movement of the hand-lever to close the main switch) conform to the arc of a circle, the center of which corresponds with the center of pivot 13, so that said further movement of the hand-lever operates to maintain the arm 19 and switch 16 in the closed position without causing further motion thereto, and consequently upon the reverse movement of the arm 12 no movement of arm 19 is permitted until the rollers 21 have traversed the arc portion of the cam edges 25, above described, when the pivot 14 has then traveled sufficiently to permit the switch 6 to respond to the actuation of spring-piston 24 to cause the opening of said main switch.

The hand-lever 12 is normally restrained in a closed position, as shown in Figs. 1 and 2, by the latch 27, which engages with the anti-friction-roller 28, (shown in Figs. 1 and 4,) secured to hand-lever 12. The spring-piston 30 is adapted to increase the efficiency of latch 27. The movable core 31 upon a predetermined flow in its surrounding solenoid 32 is adapted to actuate latch 27 to release the hand-lever 12 to permit the opening of the switches in the manner above described. The springs 26 are adapted to quicken the movement of said hand-lever 12 when the same is released.

My improved laminated bridge is made as

follows: The laminæ are of metal, and, as is best shown in Fig. 4, the end portions of these laminæ are formed approximately in circular arcs, the centers of the arcs formed by the inner and shorter laminæ being closer to the inside edge of the bridge than the centers of those of the outer and longer laminæ. The result of this arrangement is to provide a separation from each other of the contacting edges of the laminæ to allow room for play or "overtravel" in closing. The contacting edges of the laminæ at each end of the bundle thereof lie approximately in planes inclining toward each other in the direction of the movement of the movable contact or bridge to engage with the fixed contacts 9 and 10—that is, the engagement of the laminated contact with the fixed contacts is somewhat in the nature of a wedge engagement. Said laminated movable contact is adapted to move in a restrained path to and away from engagement with the fixed contacts.

Suitably secured to the fixed contacts 17 and 18 and the movable contact 16 of the supplemental switch are coöperating carbons 33 and 34 for final break. These carbons are pivoted at 35 and 36, respectively, and provided with springs 37 and 38 and projections 39 and screws 42 as adjustable means for limiting the spring-actuated movement of the carbons, which are so disposed that a flat contact of the carbons is maintained after the shunt metal contacts have separated and until they have come sufficiently apart, when the carbons separate upon a line.

What I claim is—

1. In an automatic magnetic circuit-breaker the combination of a main switch, a hand-lever for operating the movable contact of same, a supplemental switch in shunt with the main switch, a pivoted arm carrying the movable contact of the shunt-switch, the hand-lever adapted to act upon the pivoted arm by cam engagement to close the shunt-switch, the hand-lever being connected to the movable contact of the main switch with a certain amount of play to secure the closing of the shunt-switch before that of the main switch, and the opening of the main switch before that of the shunt-switch.

2. In an automatic magnetic circuit-breaker the combination of a main switch, a hand-lever for operating the movable contact of same, a supplemental switch in shunt with the main switch, a pivoted arm carrying the movable contact of the shunt-switch, the hand-lever provided with a projection adapted to act upon the pivoted arm by cam engagement to close the shunt-switch, means connected between the hand-lever and the main switch for closing the latter after the hand-lever has closed the shunt-switch, and adapted to permit the opening of the main switch before the opening of the shunt-switch.

3. In an automatic magnetic circuit-breaker the combination of a main switch and a supplemental switch, each having a movable sup-

port independent of the other, spring means for actuating said switches and a manually-operative closing member having toggle-joint connection with the main switch and cam engagement with the supplemental switch, substantially as described.

4. In an automatic magnetic circuit-breaker the combination of a main switch and a supplemental switch independently movable with respect to each other, spring means for actuating same, a manually-operative closing member having toggle-joint connection with the main switch and cam engagement with the supplemental switch to cause the movement of the supplemental switch first in closing and to permit the movement of the supplemental switch first in opening the circuit, substantially as described.

5. In an automatic magnetic circuit-breaker the combination of a main switch and a supplemental switch in shunt therewith, a pivoted hand-lever and a rod pivotally secured to the movable contact of the main switch and having also a pivot-and-slot connection with the hand-lever, a pivoted member carrying the movable contact of the shunt-switch and operated to hold it in the closed position by the hand-lever prior to the closing of the main switch, and until after the opening of the same.

6. An electric contact member composed of metal laminæ the outer ends of which are formed approximately in circular arcs, the centers of the arcs of the inner and shorter laminæ being closer to the inside edge of the bridge than those of the outer and longer laminæ, said laminæ being separated and lying apart, toward and at their extremities or contacting edges.

7. An electric contact member composed of metal laminæ, the outer ends of which are formed approximately in circular arcs, the centers of the arcs of the inner and shorter laminæ being closer to the inside edge of the bridge than those of the outer and longer laminæ, said laminæ being separated and lying apart toward and at their extremities or contacting edges, said contact-faces of the laminæ so disposed as to coöperate with the inclined surfaces of the fixed contacts which are inclined toward each other.

8. The combination with an electric main switch, of two coöperating carbon contacts for final break, each pivotally mounted and spring-controlled, and so disposed as to maintain a flat contact during their entire engagement with each other until after the main switch has opened, and then to separate upon a line.

9. In combination with an electric contact member, two coöperating carbon contacts for final break, each carbon having independent pivotal mounting.

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Witnesses:

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JNO. STOKES ADAMS.