No. 636,458. Patented Nov. 7, 1899.

W. M. SCOTT.

AUTOMATIC MAGNETIC CIRCUIT BREAKER.

(Application filed Jan. 23, 1899.)

(No Model.)

FIG. 1.

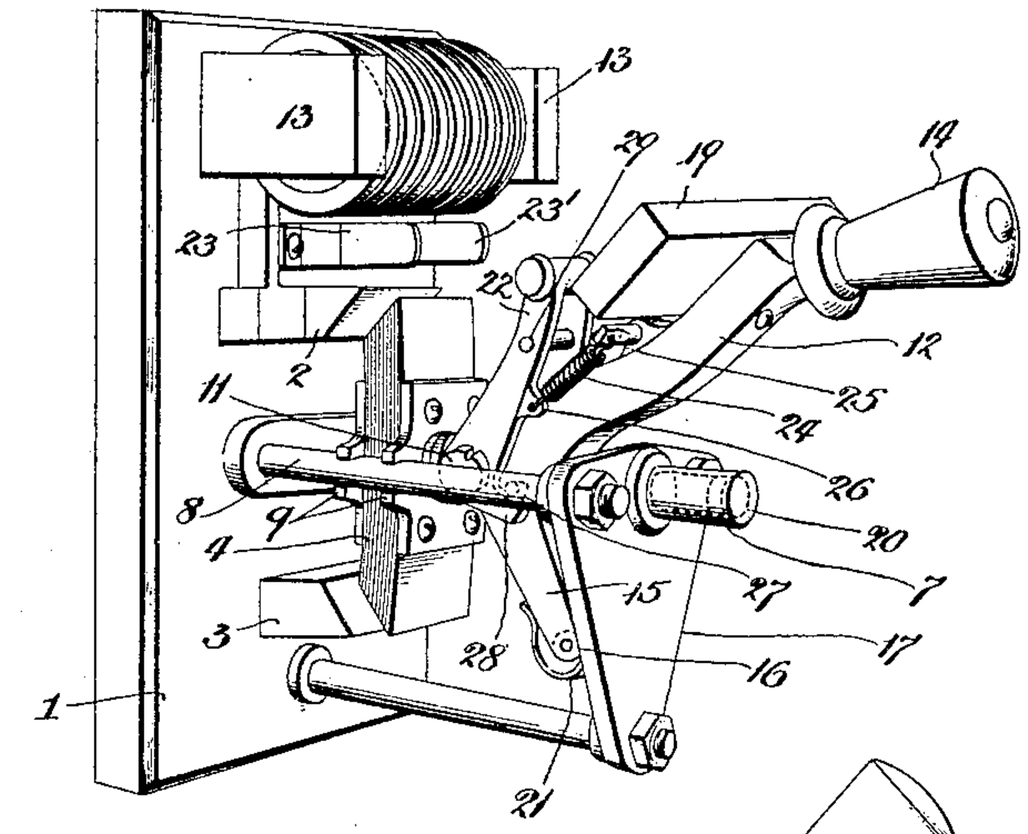


FIG. 3.

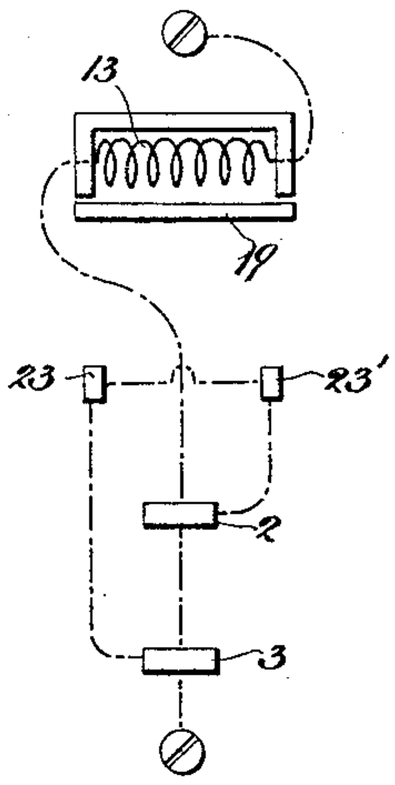
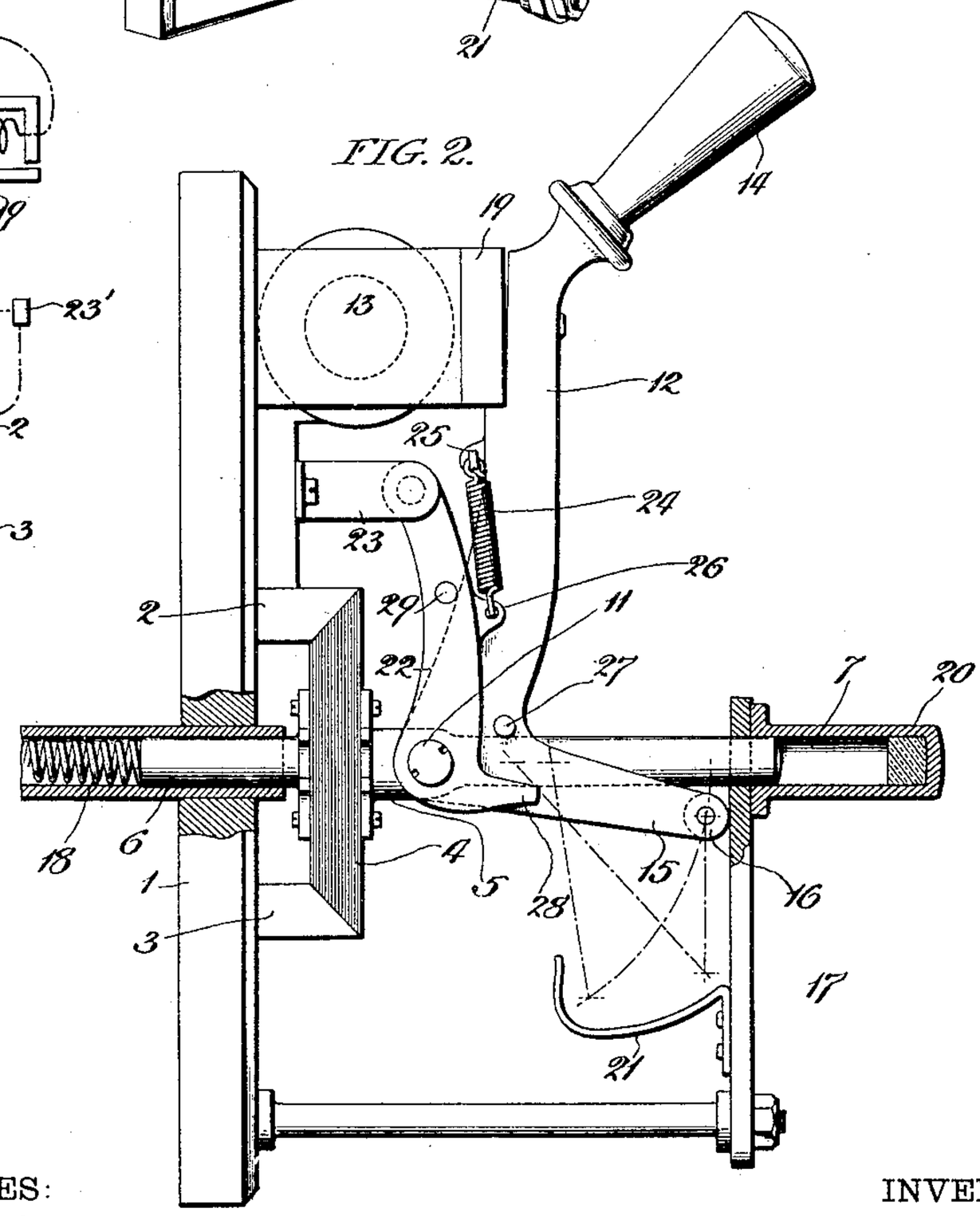


FIG. 2.



WITNESSES:
John N Reere.
Jno. Stokes Adams

INVENTOR
Wm M Scott
by Mott Goodale
Atty

UNITED STATES PATENT OFFICE.

WILLIAM M. SCOTT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE CUTTER ELECTRICAL AND MANUFACTURING COMPANY, OF NEW JERSEY.

AUTOMATIC MAGNETIC CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 636,458, dated November 7, 1899.

Application filed January 23, 1899. Serial No. 703,198. (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.

The object of my device is to afford improved means for closing the switch and for maintaining the same closed against spring or gravity actuation during the continuance of the current or predetermined flow of same through the coil of the magnet.

My device is especially adapted for underload actuation where it is desirable to employ instead of mercury-cup contacts common in underload circuit-breakers contacts of the laminated or knife-blade type. It also embodies an improved supplemental circuit-breaker in shunt to the main contacts for final separation.

I attain my object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my device in the open position. Fig. 2 is a side elevation of my device in the closed position, with sockets 6 and 7 shown in section; and Fig. 3 is a diagrammatic view of the paths of the current.

Similar numerals refer to similar parts in the several views.

Referring to the drawings, 1 represents the base, upon which the mechanism is mounted, 2 and 3 the stationary contacts, and 4 the bridge or movable contact. This bridge 4 is supported on and may be integral with the rod 5, which is in turn supported at each end by the cylinders or sockets 6 and 7, in which the said ends have a limited rectilinear movement. The guide-rods 8, engaging the recessed shoulders 9 of the bridge 4, serve to guide the bridge and prevent its rotary movement. Upon the rod 5 is pivoted at 11 the lever 12, supporting at its outer or free end the armature 19, which is adapted to engage with the poles of the electromagnet 13. Said lever is also provided with the handle 14 for its manual operation. The portion or projection 15 of the lever is provided at its outer or free end with an antifriction-roller 16, adapted to encounter the fixed or stationary guide 17. The guide 17 is so disposed that the said lever in its rotary movement in one direction will cause the shifting of the position of its supporting-pivot 11, and the consequent shifting of the bridge 4, to cause the closing of the switch against the actuation of the spring 18, which is located in socket 6 and bears against the end of rod 5. Upon the rotation of the lever in said direction—that is, against the actuation of spring 18—the element of the lever joining the center of pivot 11 and the point of contact of the roller 16 with the guide 17 approaches a dead-center as the bridge is forced into contact with its fixed contacts. The armature 19, carried at the end of lever 12, is also brought into engagement with the poles of the magnet 13, whereby during the continuance of the current or a predetermined flow of same through the coil of the magnet the lever is held in said position to maintain the switch closed. Upon the interruption of said predetermined flow the armature is released and permits the backward rotation of the lever to which it is attached, and the rod 5, responding to the actuation of the spring 18, causes the separation of the bridge from its fixed contacts. The spring-actuated movement of rod 5 is limited by the cushion-stop 20 in end of socket 7.

The spring 21 is adapted to encounter the roller 16 to gradually check and finally arrest said spring-actuated rotary movement of the lever.

The supplemental lever 22, supported also on pivot 11, carries at its free end a bridge adapted to engage with the supplemental stationary contacts 23 and 23′ in shunt-circuit with the main stationary contacts 2 and 3. Connected between projection 25 on the lever 12 and projection 26 on the supplemental lever 22 is the spring 24, so disposed that its tension is exerted to maintain the supplemental switch closed when the main switch is closed and to continue its tension in the same direction until the lever 12 has rotated sufficiently to cause the opening of the main switch, when the tension of said spring is increased and its direction is changed to ex-

ert its force upon the lever 22 to tend to cause its outward rotation. This force is resisted, however, by the friction between the bridge of the supplemental switch and the stationary contacts 23 23′, while the tension of the spring continually increases until the projection 27 on lever 12 encounters the projection 28 on lever 22 to overcome said friction. The lever thereupon responding to the actuation of the spring 24 causes the opening of the supplemental switch with a quick snap. In the operation of closing the main switch by rotating the lever 12, with its armature 19, toward and to the magnet 13 the said lever 12 encounters the projection 29 on lever 22 to cause the closing of said supplemental switch.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an electric switch, the combination of separable coöperative contacts, a pivoted lever, and a fixed guide so disposed that the engagement therewith of a projection of said lever in its rotary movement in one direction will cause the engagement of said coöperative contacts, substantially as described.

2. In an automatic magnetic circuit-breaker, the combination of separable coöperative contacts, a pivoted lever, a fixed guide so disposed that the engagement therewith of a projection of said lever in its rotary movement in one direction will cause the engagement of said coöperative contacts and electromagnetic means for holding the lever in such position as to maintain the switch closed during the continuance of a predetermined flow of current, substantially as described.

3. In an electric switch, the combination of separable coöperative contacts, a pivoted lever, a fixed guide so disposed that the engagement therewith of a projection of said lever in its rotary movement in one direction will cause the engagement of said coöperative contacts and a supplemental switch in shunt with the main switch, the supporting member of the movable contact of the former being pivoted and spring-connected with said pivoted lever and adapted to be positively actuated by said lever for final closing and initial opening, substantially as described.

4. In an electric switch, the combination of separable coöperative contacts, a pivoted lever, and a fixed guide so disposed that the engagement therewith of a projection of said lever in its rotary movement in one direction will cause the engagement of said coöperative contacts, the element of said lever joining the center of its pivot-bearing and the point of contact of the lever with the guide, approaching a dead-center, substantially as described.

5. In an electric switch, the combination of fixed and movable contacts, a pivoted lever with its pivot-bearing maintained in a position constant relatively with that of the movable contact and a fixed guide so disposed that the engagement therewith of a projection of said lever in its rotary movement in one direction will cause the shifting of said pivot-bearing and the consequent movement of the movable contact to engage with the fixed contacts, substantially as described.

6. In an automatic magnetic circuit-breaker, the combination of fixed and movable contacts, a pivoted lever with its pivot-bearing maintained in a position relatively constant with that of the movable contact, a fixed guide so disposed that the engagement therewith of a projection of said lever, in its rotary movement in one direction will cause the shifting of its said pivot-bearing and the consequent movement of the movable contact to engage with the fixed contacts, an electromagnet and armature, the armature connected with the lever, the magnet fixed and so disposed as to coöperate with the armature to hold the lever in such position as to maintain the switch closed during the continuance of a predetermined flow of current and means for causing the opening of the switch upon the release of the armature, substantially as described.

WM. M. SCOTT.

Witnesses:
JNO. STOKES ADAMS,
MAE HOFFMANN.