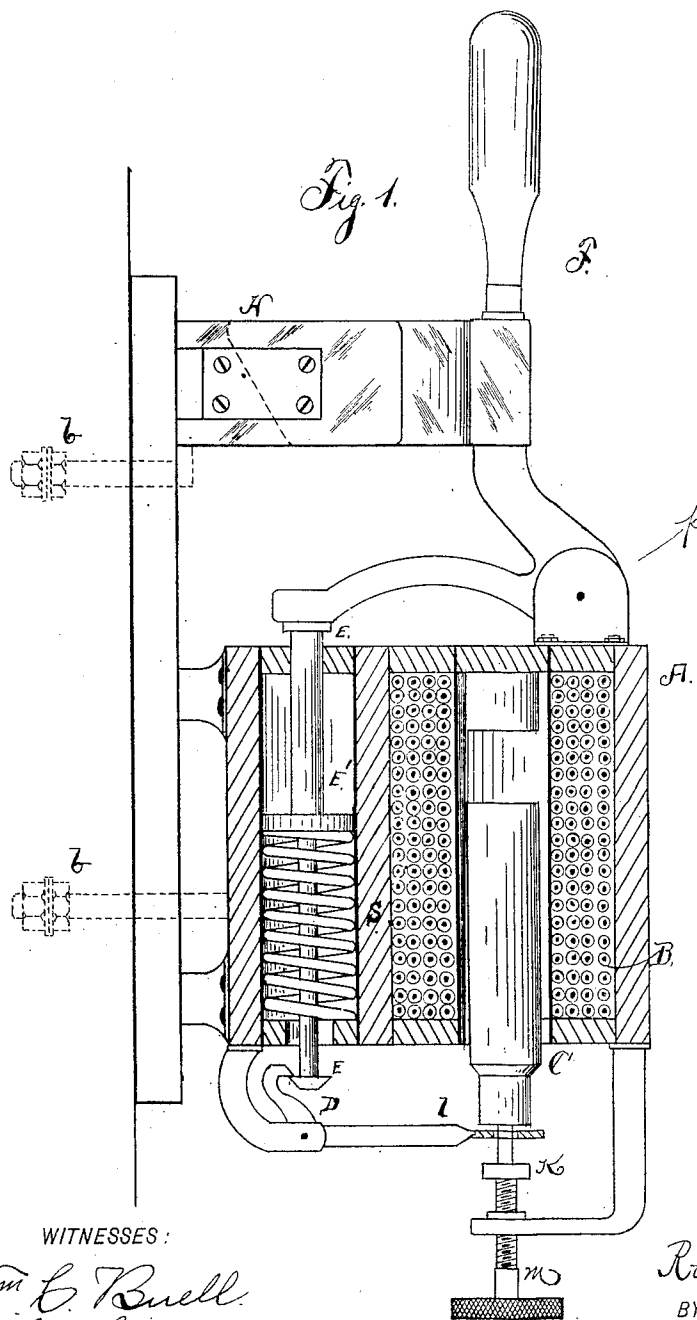


(No Model.)

R. L. HAILEY.
COMBINED MANUAL AND AUTOMATIC SWITCH.

No. 596,457.

Patented Dec. 28, 1897.



WITNESSES:

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ROBERT LEE HAILEY, OF NEW YORK, N. Y.

COMBINED MANUAL AND AUTOMATIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 596,457, dated December 28, 1897.

Application filed September 27, 1897. Serial No. 653,183. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LEE HAILEY, of the city, county, and State of New York, have invented a Combined Manual Switch and Automatic Circuit-Breaker, of which the following is a specification.

My invention consists, primarily, in the combination, with a manually-operated switch for electric circuits, of an electromechanical circuit-breaker adapted to open the circuit when the currents charging the same exceed a predetermined pressure, substantially as hereinafter described.

My invention further consists in certain combinations and subcombinations to be hereinafter described.

In the accompanying drawing the figure is a view in cross-sectional side elevation of a combined manual switch and automatic circuit-breaker embodying my invention.

The device shown consists of the frame A, containing the solenoid-coil B, with its movable plunger C, and a spring-actuated piston E, movable in the cylindrical part E' by the compression and release of the coiled spring S, contained in the said cylinder.

The manually-operated switch F H, with its lever pivoted at p, carries a member G, which serves to force the piston E into the position shown, depressing spring S, and in which position the piston E is held by the latch D interlocking with the projecting portion of piston E until the said latch D is lifted by the attracted plunger C striking the lever l of the latch D, tripping the latch and releasing the piston E, which is moved upward by spring S, throwing the switch-lever F away from the contacts H, opening the circuit. This action takes place when the current in the circuit that includes the solenoid-coil B is augmented to the degree set for the circuit-breaker to act; but during the ordinary condition of the circuit the switch-handle F can be moved back and forth for opening and closing the circuit without releasing the said piston E, with advantages over any known form of circuit-breaker that acts by the increase of current. There are, moreover, advantages in the manner of arranging the automatically-acting magnetic circuit-breaker—namely, in the employment of the attracted plunger C to simply release the spring-actu-

ated piston E, and not, as has been usually the case, to attempt to throw the switch F by the attracted plunger C, for it sometimes occurs that the increase of current is only sufficient to lift the plunger C in a comparatively feeble manner and without sufficient force to throw the switch when it happens to be slightly corroded where it is pivoted; but by the employment of the stiff spring S, forced down by hand and held interlocked so as to be tripped by slight force, the throwing of the said switch F is accomplished with certainty.

The employment of the switch F as a manually-operated switch has the added advantage of keeping the pivoted lever F from becoming adhered by corrosion due to constant use, so that the liability of the failure to lift when called upon to act automatically is not present, a result of practical consequence. By the arrangement of the plunger C so that it will get well under motion before coming in contact with the lever l a blow is struck upon the lever l by the part k of plunger C after it has left the adjusting-screw M.

By constructing the combined manual switch and automatic circuit-breaker as described, whereby the power to automatically throw the switch F is imparted by the spring that is compressed by hand, and which is simply unlatched and released by the action of the current, a solenoid-coil of less resistance can be placed in the circuit for accomplishing a given work, with advantages over the automatic magnetic circuit-breakers depending upon the force exerted by the attracted plunger to throw the switch.

The construction shown admits of the cheapening of the automatic circuit-breaker and of dispensing with the use of an independent manually-operated switch, with advantages which are obvious where complications are to be avoided. The multiplying of contact-joints in a circuit is a disadvantage where the economy of space is desirable.

In the construction shown the switch to be thrown by hand and by the released spring S is placed above the solenoid and the spring-piston, making a desirable location for the switch when manually operated, as it is easy of access and its operation is obvious to persons skilled in the use of manual switches,

while in those magnetic circuit-breakers heretofore known a degree of skill and acquired knowledge of their construction is necessary to even admit of their being unlatched and manually operated in cases of emergency.

The switch F, located above the solenoid and frame A and so constructed and arranged as to freely move independent of the automatic magnetic spring-actuated portion of the apparatus and without tripping, releasing, or bringing into action the electromechanical portion of the apparatus, is essentially different from and more desirable than previous known circuit-breakers.

What I claim is—

1. A combined manually-operated switch and automatic circuit-breaker comprising a spring-actuated member adapted when it is released, to throw a switch, an electromagnetic releasing device having connection to the spring-actuated member and adapted to

release the same at a predetermined pressure of current, and a switch to be thrown by the said released spring-actuated member that is located above the electromechanical apparatus, and that is adapted to be freely moved by hand to open and close the circuit without tripping, releasing, or making operative the said electromechanical apparatus.

2. The frame A, containing the solenoid B, with its plunger C, the piston E, in cylinder E', with the actuating-spring S, the latching device D, connecting through lever l, with the plunger C, and the freely-moving switch F, adapted to move on its pivoted bearing *p*, independent of the releasing of piston E, the whole arranged and operating substantially as shown and described.

ROBERT LEE HAILEY.

Witnesses:

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