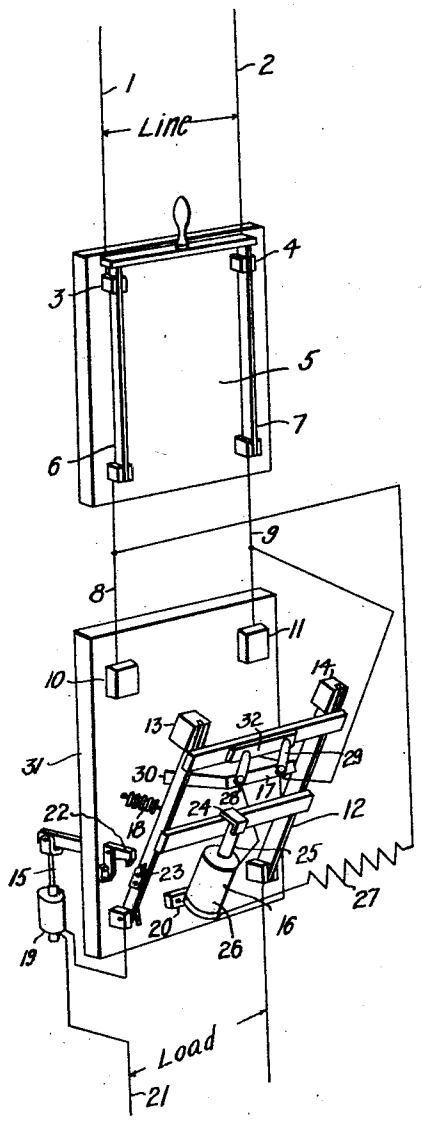
W. V. LOVELL.

CIRCUIT INTERRUPTER.

APPLICATION FILED AUG. 11, 1917.

1,406,267. Patented Feb. 14, 1922.



WITNESSES:

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CIRCUIT INTERRUPTER.

1,406,267. Specification of Letters Patent. **Patented Feb. 14, 1922.**

Application filed August 11, 1917. Serial No. 185,744.

To all whom it may concern:

Be it known that I, WILLIAM V. LOVELL, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Circuit Interrupters, of which the following is a specification.

My invention relates to circuit interrupters and particularly to interlocking devices therefor.

One object of my invention is to provide means for so latching a circuit interrupter in its open position that it cannot be closed when its disconnecting switch is in its closed position.

Another object of my invention is to provide an interlocking device of the above indicated character that shall be inexpensive to construct and effective in its operation.

In practicing my invention, I provide an automatic circuit interrupter, a disconnecting switch therefor, and an electromagnet that is connected across the circuit between the interrupter and the switch for latching the interrupter in its open position when the switch is closed. By this arrangement, when the circuit is energized the interrupter cannot be closed so long as the switch is closed but the interrupter may be closed first and the switch afterward. Thus, the interrupter may be so interlocked with its disconnecting switch that the danger of closing the interrupter after the disconnecting switch is closed is obviated.

The single figure of the accompanying drawing is a diagrammatic and perspective view of a circuit interrupting device embodying my invention.

Conductors 1 and 2 are connected to the stationary contact members 3 and 4, respectively, of a disconnecting switch 5 the movable contact members 6 and 7 of which are connected, through conductors 8 and 9, to the stationary contact members 10 and 11, respectively, of an automatic circuit interrupter 12. The circuit interrupter 12 comprises movable contact members 13 and 14, an overload tripping device 15, a locking device 16, an auxiliary switch 17 and an actuating spring 18.

The tripping device 15 comprises an electromagnet 19 one terminal of the winding of which is connected to the movable contact member 13 of the interrupter 12 and the other terminal of which is connected to a conductor 21. The electromagnet 19 is adapted to disconnect a latch member 22 from a catch member 23 with which the movable member of the interrupter 12 is provided, when an overload traverses the circuit to be protected.

A catch member 24 is mounted on the movable member of the interrupter and is adapted to be engaged by the movable member 25 of the locking device 16 under predetermined conditions. The locking device 16 is mounted on a supporting bracket 20 and comprises a winding 26 one terminal of which is connected, through a resistor 27, to the conductor 8 and the other terminal of which is connected to one of the stationary contact members 28 of the switch 17. The other stationary contact member 29 of the switch 17 is connected to the conductor 9. The contact members 28 and 29 are mounted on a supporting member 30 that is attached to the interrupter panel 31. A bridging contact member 32 is mounted on the movable member of the interrupter 12 and is adapted to bridge the contact members 28 and 29 only when the interrupter 12 is in its full open position.

When the interrupter is in the position shown in the drawing and the switch 5 is closed, the movable member 25 of the locking device 15 engages the catch 24 and prevents the interrupter 12 from being closed. Thus, it is impossible to close the interrupter after the switch 5 is closed. However, if the switch 5 is moved to its open position, the movable member 25 of the locking device 16 will be moved downwardly by reason of the de-energization of the winding 26, and the interrupter 12 may be moved to its closed position. When the interrupter 12 is moved to its closed position, the bridging member 32 becomes disengaged from the stationary contact members 28 and 29 and thus interrupts the circuit of the winding 26 in order that, when the switch 5 is closed, the winding 26 may not be energized to absorb energy during the normal operation of the interrupter.

When an overload obtains upon the circuit, the electromagnet 19 of the tripping device 15 is adapted to so actuate the latch 22 that it releases the catch 23 and permits the spring 18 to move the movable member of the interrupter 12 into such position that

the locking device 16 will hold it in its open position so long as the switch 5 remains closed.

I do not limit my invention to the particular structure illustrated, as various modifications may be made therein without departing from the spirit and scope of the same as set forth in the appended claims.

I claim as my invention:

1. A circuit-interrupting system comprising an automatic circuit interrupter, a disconnecting switch therefor and electrical interlocking means requiring that the interrupter be closed first in order to ensure protection to the system during and after the closing of the switch.

2. A circuit-interrupting system comprising an automatically actuable circuit interrupter, a disconnecting switch therefor, and means for locking the automatic interrupter in its open position, said interrupter and said switch being mechanically independent of each other and so electrically interconnected in the circuit of the system as to require the closing of the switch before the closing of the interrupter to permit the latter to automatically open under predetermined conditions of the said circuit.

3. In an electrical circuit, the combination with a circuit interrupter and a disconnecting switch therefor, of means responsive to the voltage on the circuit for preventing the closure of the interrupter so long as the switch is maintained in its closed position.

4. In an electrical circuit, the combination with a circuit interrupter and a disconnecting switch therefor, of means responsive to the voltage on the circuit for preventing the closure of the interrupter after the switch is closed and maintained in its closed position.

5. The combination with an electric circuit, of a circuit breaker, a disconnecting switch located in advance of the circuit breaker, a magnetizable member adapted, when energized, to hold the circuit breaker in a predetermined position, and a shunt circuit connected between the disconnecting switch and the circuit breaker for supplying current to the magnetizable member.

6. The combination with an electric circuit, of a circuit breaker, a disconnecting switch located in advance of the circuit breaker, a shunt circuit connected between the disconnecting switch and the circuit breaker and normally in open position, a magnetically-operated member in the shunt circuit adapted, when energized, to hold the circuit breaker in open position, and means actuated by a movable member of the circuit breaker for closing the shunt circuit when the circuit breaker is opened.

7. The combination with a circuit interrupter and a disconnecting switch, of a locking device normally held in locking position by an electromagnet to prevent closing movement of the circuit interrupter, and means whereby movement of the disconnecting switch causes deenergization of the electromagnet to thereby release the circuit interrupter.

In testimony whereof, I have hereunto subscribed my name this 30 day of July 1917.

WILLIAM V. LOVELL.