

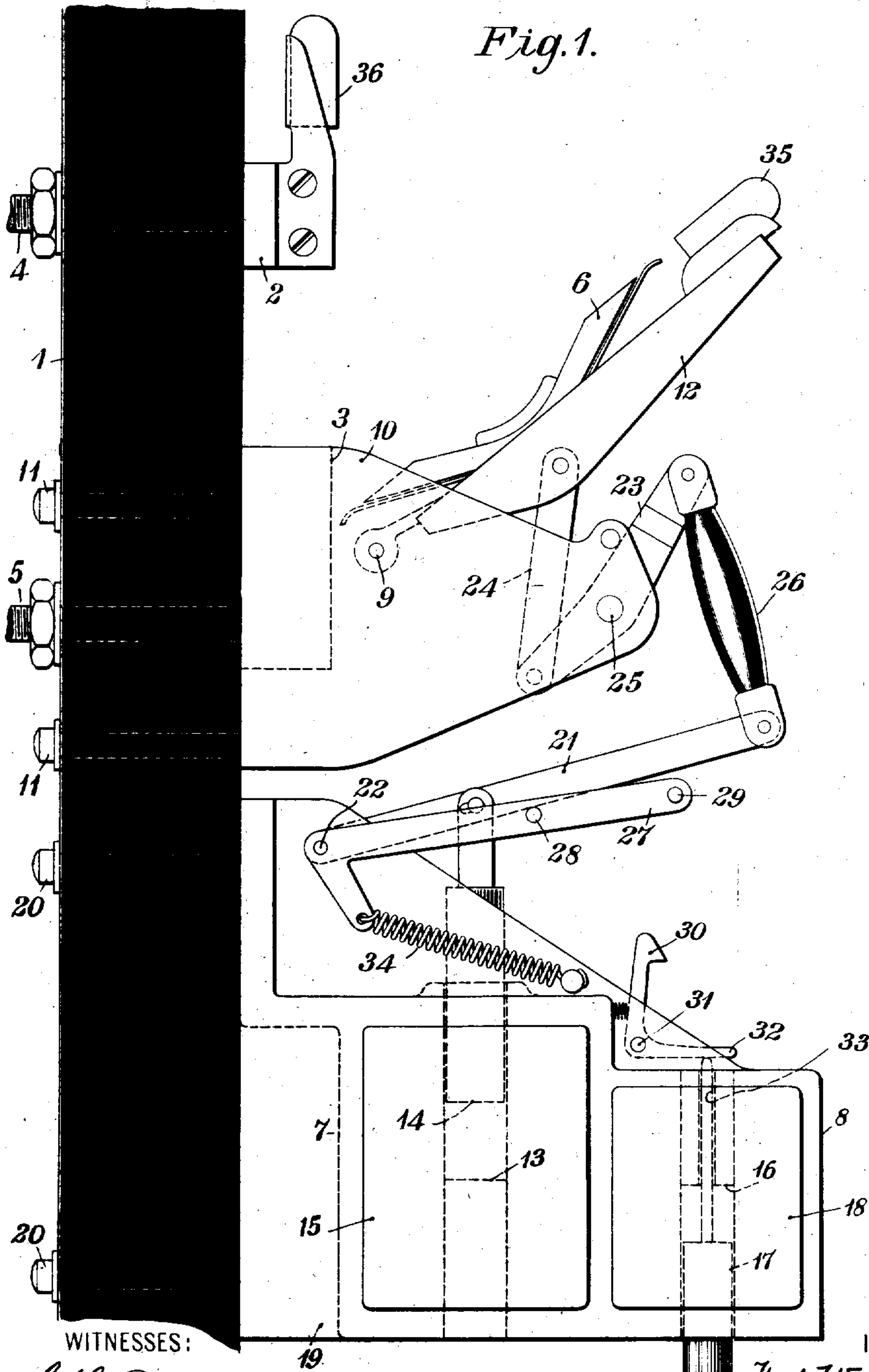
F. W. HARRIS.
CIRCUIT INTERRUPTER.
APPLICATION FILED DEC. 14, 1908.

973,938.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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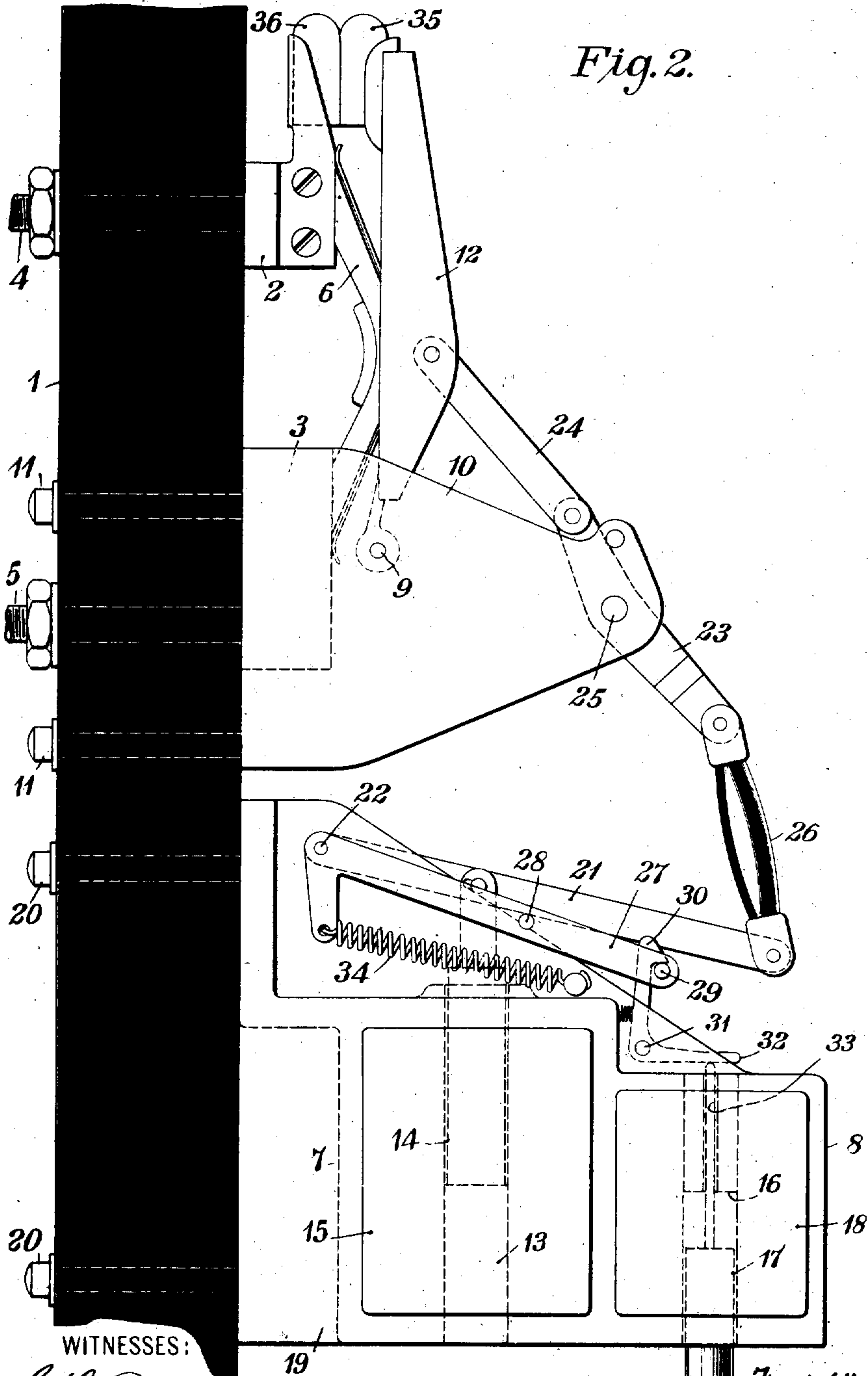
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2 SHEETS—SHEET 2.

Fig. 2.



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FORD W. HARRIS, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

CIRCUIT-INTERRUPTER.

973,938.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed December 14, 1908. Serial No. 467,524.

To all whom it may concern:

Be it known that I, FORD W. HARRIS, a citizen of the United States, and a resident of Wilksburg, 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 it has for its object to provide an automatically actuated device of this character that shall be simple and compact in construction and capable of remote control.

Figures 1 and 2 of the accompanying drawing are side elevations of a circuit interrupter constructed in accordance with my invention, and respectively in open and in closed position.

Referring to the drawings, the device illustrated comprises an insulating slab or base 1, stationary contact terminals 2 and 3 having bolt projections 4 and 5 which extend through the insulating base 1 and constitute the terminals of the device, a movable bridging contact member 6, a closing magnet 7 and a tripping magnet 8.

The bridging contact member 6 is supported by a lever 12 one end of which is pivotally mounted upon a shaft 9 that is supported by a bracket 10, said bracket being secured to the base by screws 11. The closing magnet 7 comprises stationary and movable core members 13 and 14 and a magnet winding 15, and the tripping magnet 8 comprises stationary and movable core members 16 and 17 and a coil 18, both of the magnets being supported by a single bracket 19 which is secured to the base 1 by screws 20. The movable core member 14 is pivotally suspended from a lever 21 the end of which is mounted on a stationary shaft 22. The lever 12, by which the bridging contact member 6 is supported, is connected to the inner end of a lever 23 by means of a link 24. The lever 23 is supported by a stationary shaft 25 and its outer end is connected to the outer end of the lever 21 by means of an insulating link 26 which constitutes the handle grip by which the interrupter may be manually operated. The links 24 and 26 and the levers 23 and 21 are so arranged as to hold the circuit interrupter closed by assuming a locking relation when the member 6 is moved into closed position, either

manually or by reason of the energization of the closing magnet 7.

A bell crank lever 27 is supported by the shaft 22 and is provided with a pin projection 28 which engages the lever 21 and with a second projection 29 which is adapted to be engaged by a latch 30, which forms a part of the tripping mechanism, when the interrupter is closed. The latch 30 is pivotally mounted on a shaft 31 and is provided with a projection 32 which is engaged by a hammer rod 33, that forms a part of the movable core member 17 and extends through the stationary core member 16 of the magnet 8. One arm of the bell crank lever 27 is connected to one end of a spring 34 which tends to so rotate the bell crank lever as to open the circuit interrupter as soon as the latch 30 is released by the action of the tripping magnet. Since the lever 21 engages the pin projection 28, the bell crank lever will be held stationary by the latch 30 whenever the circuit interrupter is closed. The outer end of the lever 12 is provided with an arcing contact member 35, which is adapted to engage a corresponding contact member 36 that forms a part of the stationary contact member 2. Since the point of connection between the lever 21 and the movable core member 14 of the operating magnet 7 is relatively near the fulcrum 22, the maximum air gap existing between the movable and stationary core members 13 and 14 may be relatively small, and, since the lever 23 is fulcrumed at an intermediate point which is relatively near the link 24, the interrupter may be readily closed by the operating handle 26.

The operation of the device is as follows: Assuming that the breaker occupies its open position, as shown in Fig. 1 of the drawings, it may be closed by a downward movement of the handle grip 26 which may be effected manually or by the magnet coil 15. In either case, the levers 21 and 27 are rotated in a clockwise direction, in opposition to the spring 34, until the latch 30 engages the pin 29, as shown in Fig. 2. The operating parts 21, 26, 23 and 24 are then free from the action of the spring 34 and their proportions and arrangement are such as to lock the breaker closed. The breaker may be opened by the manipulation of the handle 26 without releasing the lever 27 or it may

be automatically opened by energizing the magnet coil 18 to release the latch 30 and allow the spring 34 to act upon the lever 21, thereby breaking the toggle joint formed by the parts 21, 26, 23 and 24.

The structural details of the device may, of course, be varied without departing from the spirit of my invention, and I desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. The combination with stationary and movable contact members and an operating lever for the movable contact member, and an interposed link, of a solenoid, a core a lever to which said core is attached, a link interposed between said levers and constituting a handle grip for manually operating said movable contact member, and an electro-magnetically released lever for actuating said levers and links to open the breaker.
2. In a circuit breaker, the combination with stationary contact terminals, a movable contact member, an operating lever and a remotely controllable lever and an insulating link interposed between it and said operating lever, of a spring-restrained lever adapted to be actuated in one direction by said remotely controllable lever and adapted to actuate said lever in the opposite direction, and an electromagnetically actuated latch for holding said spring-restrained lever to permit independent manual operation of the remotely controllable lever to open the breaker.
3. In a circuit breaker, the combination with stationary contact terminals, a movable contact member, a set of cooperating links and levers adapted for manual operation to open or close the breaker and a solenoid and core for operating said links and levers to close the breaker, of a spring-actuated lever for tripping the link and lever mechanism to open the breaker, and an electromagnetically actuated latch for normally holding said spring-actuated lever in an inactive position.
4. The combination with a circuit interrupter comprising an insulating plate or

slab, stationary contact members and a stationary bracket, a movable bridging contact member pivotally mounted on the bracket, an operating lever fulcrumed at the outer end of the bracket, and a link between said bridging contact member and said operating lever, of a remotely controllable lever, a bell crank lever actuated by said remotely controllable lever, a spring secured to one arm of said bell crank lever to oppose the action of said remotely controllable lever, a latch for restraining the bell crank lever against the action of said spring, a tripping magnet for the latch and a link of insulating material interposed between the operating lever and the remotely controllable lever, to constitute a handle grip for the manual operation of the interrupter.

5. The combination with an insulating plate or slab, a circuit interrupter comprising stationary contact members, a stationary bracket secured to the plate or slab, a bridging contact member pivotally mounted on the bracket, an operating lever fulcrumed at the outer end of the bracket and a link interposed between the inner end of the operating lever and the bridging contact member, of a remotely controllable means for governing the circuit interrupter, said means comprising a stationary bracket independent of the interrupter, an operating electro-magnet and a releasing electro-magnet, a lever pivotally secured to the magnet bracket, a bell crank lever fulcrumed on the same axis and having a projection to engage said lever, a spring tending to rotate the lever in opposition to the pull of the operating electro-magnet, a latch for restraining the bell crank lever and an insulating link, interposed between the operating lever and the magnet lever to constitute a handle grip for manually operating the interrupter.

In testimony whereof, I have hereunto subscribed my name this 30th day of November, 1908.

FORD W. HARRIS.

Witnesses:

C. AALBORG,
BIRNEY HINES.