W. S. MITCHELL.

CIRCUIT BREAKER.

APPLICATION FILED JULY 6, 1918.

1,323,897.

Patented Dec. 2, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

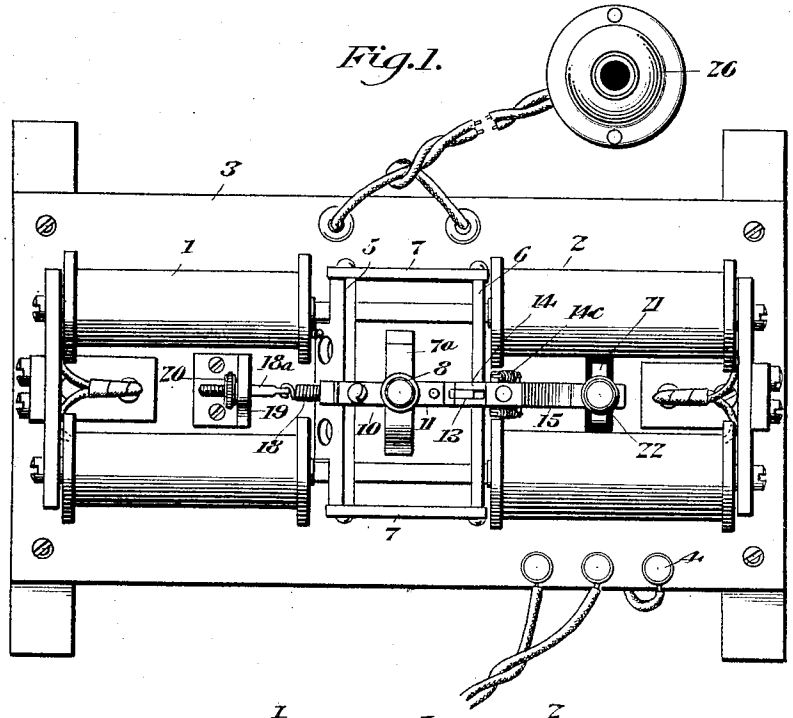
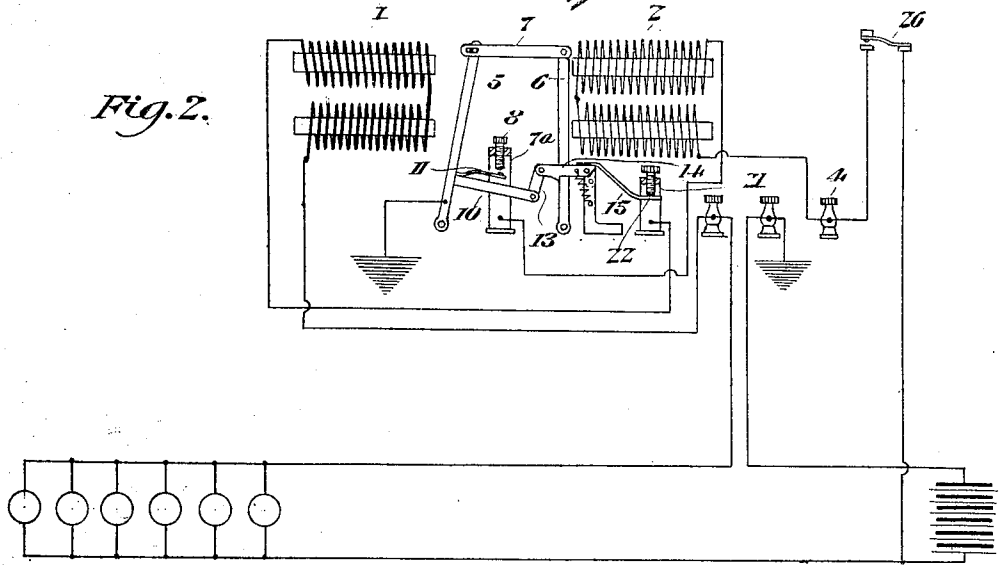


Fig. 2.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 3.

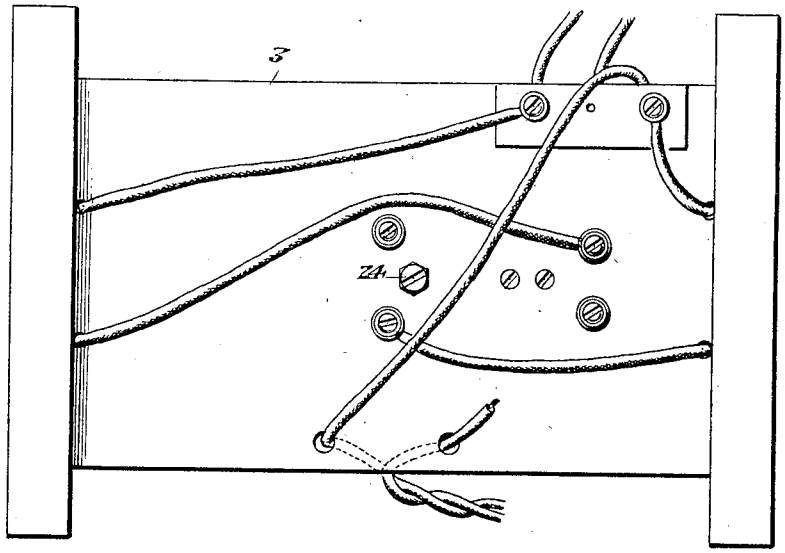
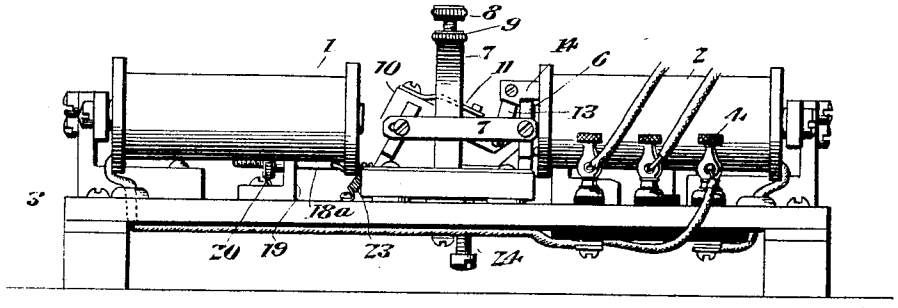


Fig. 3a.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 4.

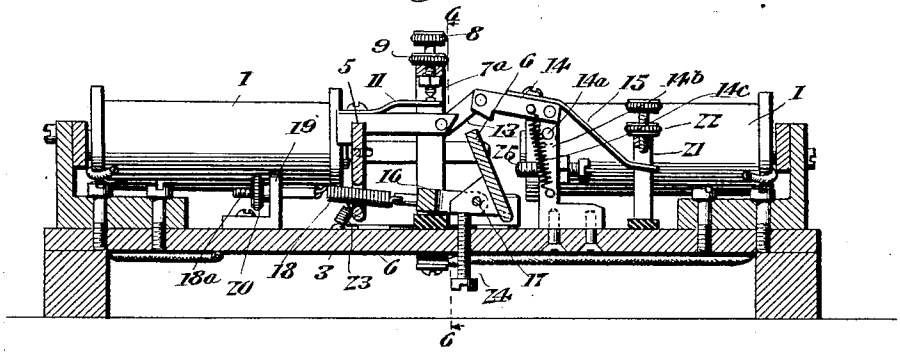


Fig. 5.

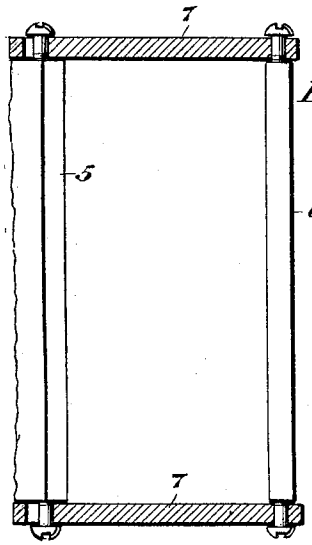


Fig. 7.

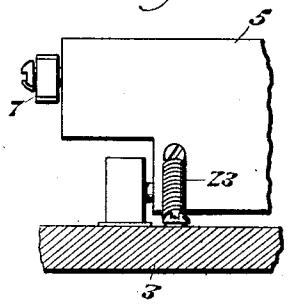
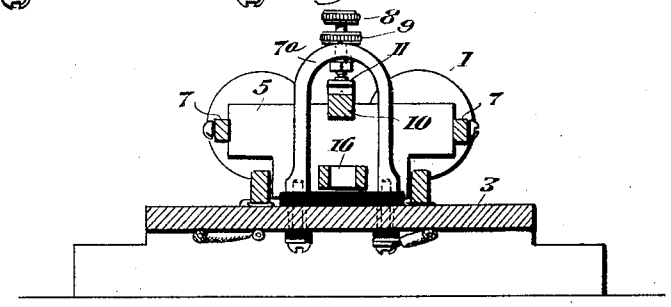


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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CIRCUIT-BREAKER.

1,323,897. Specification of Letters Patent. Patented Dec. 2, 1919.

Application filed July 6, 1918. Serial No. 243,559.

To all whom it may concern:

Be it known that I, WILLIAM S. MITCHELL, a citizen of the United States, residing at Eveleth, in the county of St. Louis and State of Minnesota, have invented new and useful Improvements in Circuit-Breakers, of which the following is a specification.

My present invention pertains to circuit breakers, and it contemplates the provision of an advantageous double automatic circuit breaker through the medium of which current may be readily put on a load subsequently to the short circuiting of the system, and this at a point remote from the circuit breaker.

With the foregoing in mind the invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a plan view of a double automatic circuit breaker constructed in accordance with my invention.

Fig. 2 is a view diagrammatic in character and showing a system of which the circuit breaker is a part.

Fig. 3 is an inverted plan view of the circuit breaker, showing the wiring at the underside thereof.

Fig. 3ª is a side elevation of the circuit breaker.

Fig. 4 is a longitudinal vertical section taken in a plane through the yokes of the device and at one side of the link and latch connection.

Fig. 5 is a detail section showing the slotted connection between the side bars and the armatures.

Fig. 6 is a cross section on line 6—6 of Fig. 4.

Fig. 7 is a detail view showing the retractile and grounding spring complementary to one of the armatures.

Similar numerals of reference designate corresponding parts in all the views of the drawings.

In the preferred embodiment of my invention I arrange two pairs of electro-magnets 1 and 2 on a suitable support 3, and I provide the support with binding posts 4, and wiring such as shown in Fig. 3.

The electro-magnets 1 are wound with a heavier wire than the magnets 2; the said magnets 1, being designed to carry the load and the comparatively heavy wiring being resorted to in order to preclude over heating of the coils of the magnets 1. The wiring above and below the support 3 will be readily understood by comparison of the figures of the drawings, and it will also be noted by reference to Fig. 2 that the coils of the magnets 1 are connected in series with the load.

Interposed and movable between the magnets 1 and 2 are armatures 5 and 6, and connected to the said armatures are side bars 7; the connection between side bars and the armature 6 being preferably a loose connection in order to furnish lost motion which is desirable for purposes hereinafter set forth.

Fixed between the armatures is a yoke 7ª and bearing in said yoke is a screw 8 that carries a locking nut 9.

Fixed on the armature 5 is a link 10, and carried by the said link is a flat spring 11 designed to bring up against the lower end of the screw 8. Pivoted at 12 to the link 10 is a second link 13 and pivoted to the said second link is a latch member 14 on which is a spring strip 15. The latch member 14 which engages armature 6 is pivoted at 14ª to a fixed standard 14ᵇ and is yieldingly pulled downwardly by retractile springs 14ᶜ. Connected through links 16 and 17 which are pivoted together, with the armature 5 is one end of a coiled spring 18, and the opposite end of this spring is connected to an adjustment rod 18ª that is adapted to slide in a standard 19 on the support 3 and is provided back of the standard with a nut 20. It will be noted that the said spring extends loosely through an aperture in the armature 5 so as not to interfere with the movement of the said armature. The free end of the spring strip 15 is disposed in a fixed yoke 21 and is opposed to the lower end of a screw 22 that bears in the upper end of the said yoke. Interposed between and connected to the armature 5 and the conductive support 3 is a retractile spring 23. This spring serves as a ground wire, and also to maintain the spring strips 11 and 15 bearing contacts in broken position.

At 24, Fig. 3, and at 25 Fig. 4, are set screws to prevent the armatures moving too far in opposite directions; the screw 24 bearing in support 3, and the screw 25 in standard 14ᵇ.

At 26 in the diagrammatic view Fig. 2 and

also in Fig. 1 is a push button designed to be used as hereinafter set forth.

In the practical use of my improvement it will be understood that when the line is short circuited at any point it will result in the armature member 5 being moved over with the result that the current will be thrown into the coils of the magnets 2; the said coils of the magnets 2 being still open. Then when the trouble has been located and corrected it is simply necessary for some person in authority to press the push button 26 when the armature 6 will be moved over and the current will be restored to the load.

The loose connection between the side bars of the armatures and one of the armatures, hereinbefore referred to is advantageous since when the magnets 1 draw the armature 5 over, the latch member 14 that holds the armature 6 will be lifted before moving forwardly.

My novel doubling automatic circuit breaker is susceptible of a wide range of use as will be fully understood when it is stated that the circuit breaker can be used to advantage in a work shop where there is considerable testing of electrical appliances to be done. In this application a push button could be placed at each working bench, and any workman could put the current on irrespective of the distance between him and the circuit breaker. Moreover the system could be installed in a building of a number of stories and a push button could be placed at some convenient place on each floor, and it could manifestly be used to advantage in a number of other instalments where short circuiting frequently occurs.

It will be understood from the foregoing that the coils of the electro-magnets 1 and 2 may be wound according to the voltage; the circuit breaker having been successfully used with a current of 110 volts A. C., and this without blowing out a 5 ampere fuse.

Having described my invention what I claim and desire to secure by Letters-Patent is:

1. A double automatic circuit breaker comprising two magnets one of which is wound with heavier wire than the other and is connected in series with a load and is also connected with a normally open circuit closing means, armatures connected together and opposed to the said magnets, a series of connected links connected with and movable by one armature, and comprising a latch for the other armature, and contact means connected with and movable by said links.

2. A double automatic circuit breaker comprising two electromagnets, one of the magnets being wound with wires heavier than the wire of the other and being connected in series with a load and also connected with a normally open circuit in which are means for closing the same, armatures interposed between and opposed to said magnets, means connecting said armatures, a link fixed on one armature and bearing a contact spring, a yoke having a contact opposed to said spring, a second link pivoted to the first named link, a third link and latch arranged beyond the other armature and bearing a contact strip, a yoke receiving said strip and having a contact opposed to same, and electrical connections.

3. An automatic double circuit breaker comprising electro-magnets one of which is wound with wire heavier than the wire of the other and is connected in series with a load and also with a normally open circuit containing means for closing said circuit, swinging armatures arranged between the magnets, a retractile spring, a link connection between said spring and the armature remote from the same, a link fixed on the other armature and having a contact strip, side bars connected with the armatures, a yoke having a contact opposed to said spring strip, a second link pivotally connected to the first named link, a third link and latch pivotally connected to the second link and bearing a spring strip, a yoke receiving said strip, a contact on the yoke and opposed to the strip, and electrical connections.

4. A double automatic circuit breaker comprising two magnets one of which is connected in series with a load and is also connected with a normally open circuit-closing means, armatures connected together and opposed to the said magnets, means connected with and movable by one armature and including means for holding the other armature, and contact means connected with and movable by the first-named means.

5. A double automatic circuit breaker comprising two magnets one of which is connected in series with a load and is also connected with a normally open circuit-closing means, armatures connected together and opposed to the said magnets, a series of connected links connected with and movable by one armature and comprising means for holding the other armature, and contact means connected with and movable by said links.

In testimony whereof I affix my signature.

WILLIAM S. MITCHELL.