

No. 678,881.

Patented July 23, 1901.

C. E. HOLMES.
CIRCUIT BREAKER.

(Application filed Mar. 31, 1900.)

(No Model.)

Fig. 1.

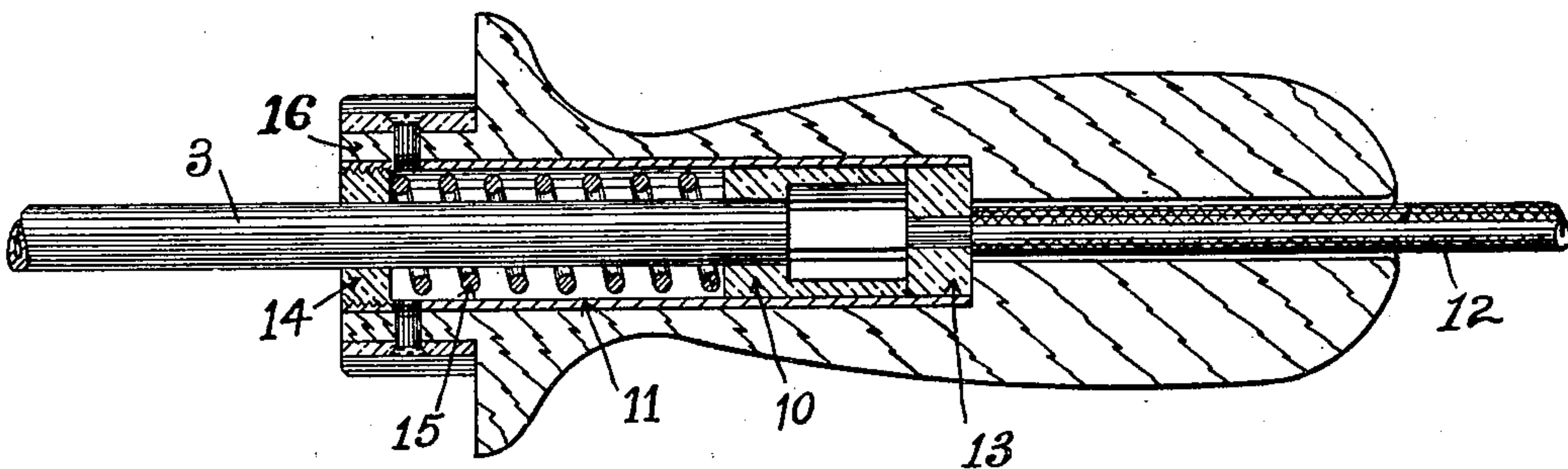
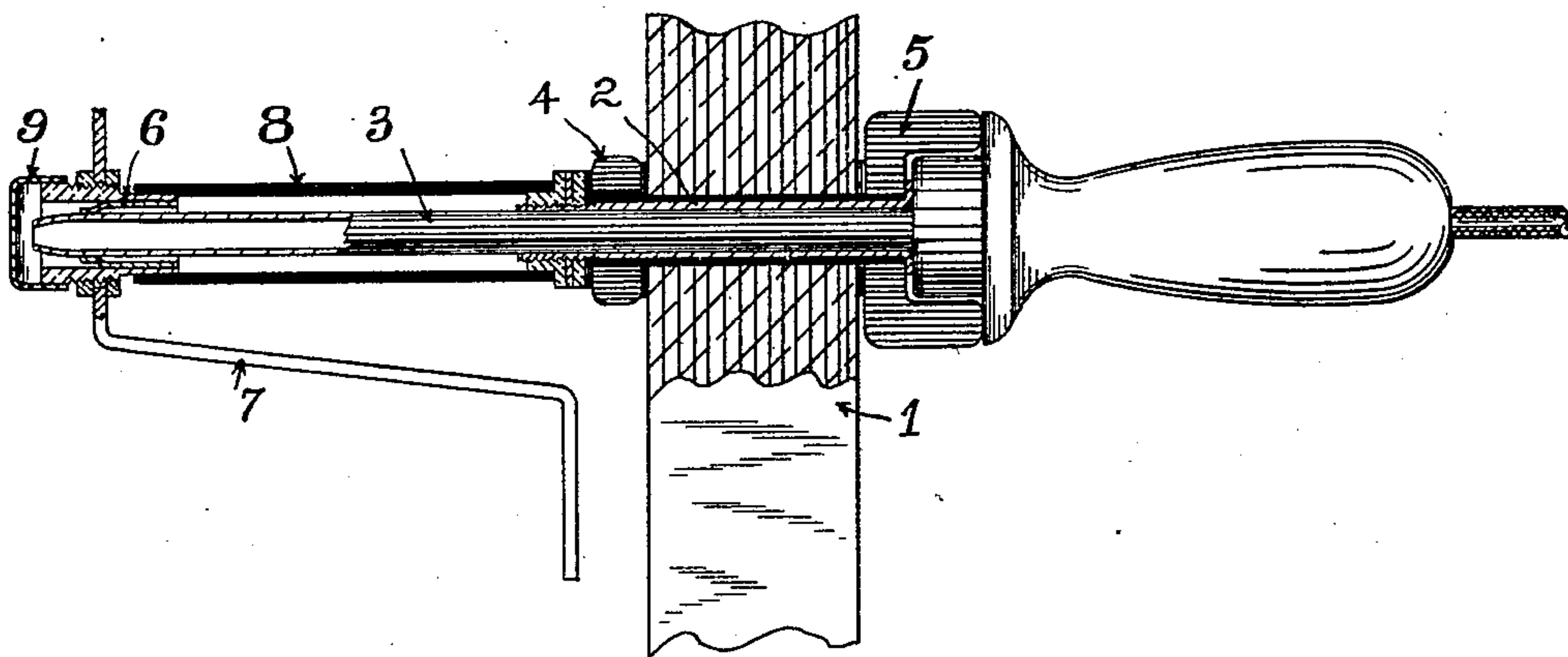


Fig. 2.

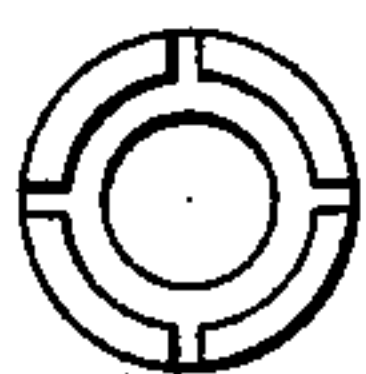


Fig. 3.

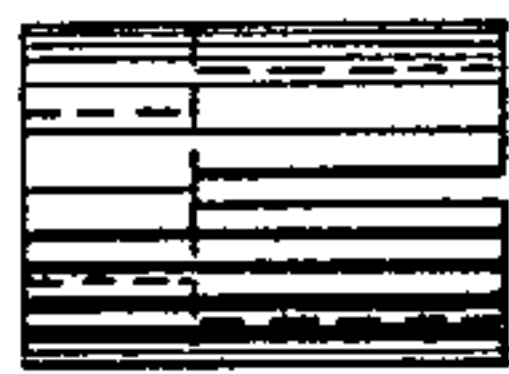


Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES E. HOLMES, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, OF NEW YORK.

CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 678,881, dated July 23, 1901.

Application filed March 31, 1900. Serial No. 10,886. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HOLMES, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have
5 invented certain new and useful Improvements in Circuit-Breakers, (Case No. 1,477,) of which the following is a specification.

This invention relates to a device for rupturing circuits of considerable voltage, such
10 as are liable to create damage to the contacts from arcs formed when the contacts are separated.

The invention is particularly applicable to plug-switches in which a contact forming one
15 terminal of the circuit and mounted on a plug is inserted in a fixed support containing the other terminal of the circuit. Devices of this kind have heretofore been constructed so that a movable contact by which the connection
20 is made is rigidly attached to the operating-handle, and arcing has been in a measure prevented by a rapid hand movement in withdrawing the plug. I provide for a better rupture of the circuit by rendering the contact
25 movable with relation to the plug and giving it an elastic seat, so that in withdrawing the plug a spring is strained, the rebound of which when the fixed and movable contacts separate rapidly produces a long break and extinguishes the arc.
30

My invention therefore comprises a circuit-breaker or switch of the plug type in which a circuit-completing contact carried by the
35 plug is elastically mounted thereon and enters into friction-tight engagement with the fixed terminal when the circuit is closed.

Other more specific features of the invention will be hereinafter fully described, and definitely indicated in the claims appended
40 hereto.

In the accompanying drawings, which illustrate the invention, Figure 1 is a sectional elevation of a plug-switch embodying my improvements. Fig. 2 is an enlarged view showing
45 the construction of the elastic mounting for the movable contact. Figs. 3 and 4 are views of details.

The invention is of particular service in connection with such circuits as those used
50 in arc-lighting, where a moderately high potential is employed and in which it is desir-

able to prevent arcing at the contacts. Plug-tube switches are now commonly employed in the switchboards governing such circuits, in which the fixed terminal, or, it may be, two
55 fixed terminals, are closed by the insertion of a conducting-plug attached to an insulating-handle. In other types the plug itself forms the movable terminal of the circuit, being connected to one side thereof by means of a
60 flexible conducting-cord extending from the handle. I have shown in the drawings this type of plug-switch.

1 represents the switchboard, commonly constructed of slate or other fireproof insulating material, in which is mounted a socket
65 2, forming a guide for the conducting-plug 3. On the front and rear sides of the switchboard are mounted porcelain insulators 4 5. The fixed circuit-terminal is an elastic thimble or
70 cup 6, mounted on a bracket 7, secured to the rear side of the board, and this terminal is connected with the guiding-socket in the board by an insulating-tube 8. The end of the terminal is also covered by a cap 9, thus
75 completely inclosing the contact when the circuit is closed and preventing scattering of the arc or hot metal when the circuit is broken. I mount that part of the plug which effects the closure of the circuit in movable relation to the
80 handle and connect it thereto by a spring, so that in withdrawing the handle the spring may be strained and the circuit opened with a snap when the tip of the plug moves out of engagement with the fixed contact 6. This
85 might be effected by establishing the spring-joint at any suitable part of the plug. For convenience, however, I prefer to mount the spring in the handle of the plug, as indicated in Fig. 2, making the entire stem 3 of metal,
90 such as brass, sliding loosely in the socket in the handle and terminating at the rear in a cup-contact 10, screwed to the end of the plug and provided with a number of saw cuts, as indicated in Figs. 2, 3, and 4, to promote an
95 elastic contact with the conducting-lining 11 of the handle. The latter is in electric connection with a flexible conducting-cord 12 by a soldered or other good conducting-joint formed with a head 13, secured to the lining.
100 Between the screw-plug 14 in the end of the socket and the cup-contact 10 is a helical

spring 15. The handle is provided with a short stem 16, cooperating with the insulator 5, covering the metal parts.

From the construction described it will be evident that when the plug is pushed into its socket electric connection is made between the flexible cord and the fixed circuit-terminal 6 by the joint effected by the insertion of the conducting-stem 3.

In withdrawing the plug the friction of the stem and fixed terminal insures compression of the helical spring 15, the cup 10 maintaining good contact throughout all parts of the metal lining 11. When the spring is strained sufficiently to overcome the friction of the contact, the spring rapidly rebounds and the arc at the terminals extinguished.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An electric-circuit breaker comprising an elastically-seated contact mounted on a movable plug, a socket-contact adapted to frictionally engage the same and a sliding electric connection between a plug-contact and a flexible terminal.

2. An electric-circuit breaker comprising a

fixed circuit-terminal, a plug carrying a contact to close the circuit and form a friction-tight joint with the fixed terminal, and a spring connection between the handle of the plug and the movable terminal.

3. A plug-switch comprising a fixed terminal, a movable contact on the stem of the plug, a conducting-socket in the handle in which said stem is movably mounted, a cooperating terminal carried by the handle, and a spring between a fixed part of the handle and the stem.

4. A plug-switch comprising an insulated handle containing a metal socket forming one circuit-terminal, a metal circuit-closing stem movable in said socket and carrying an elastic contact engaging the socket, and a helical spring acting upon the stem to retract it into the socket.

In witness whereof I have hereunto set my hand this 29th day of March, 1900.

CHARLES E. HOLMES.

Witnesses:

DUGALD MCKILLOP,
CHAS. B. BETHUNE.