

June 24, 1952

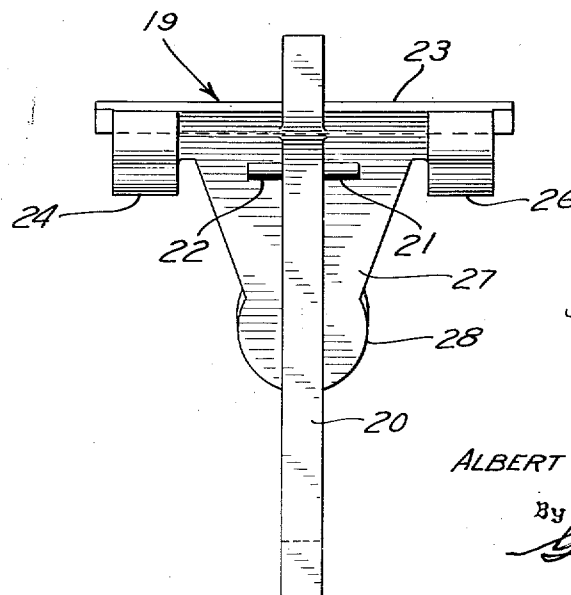
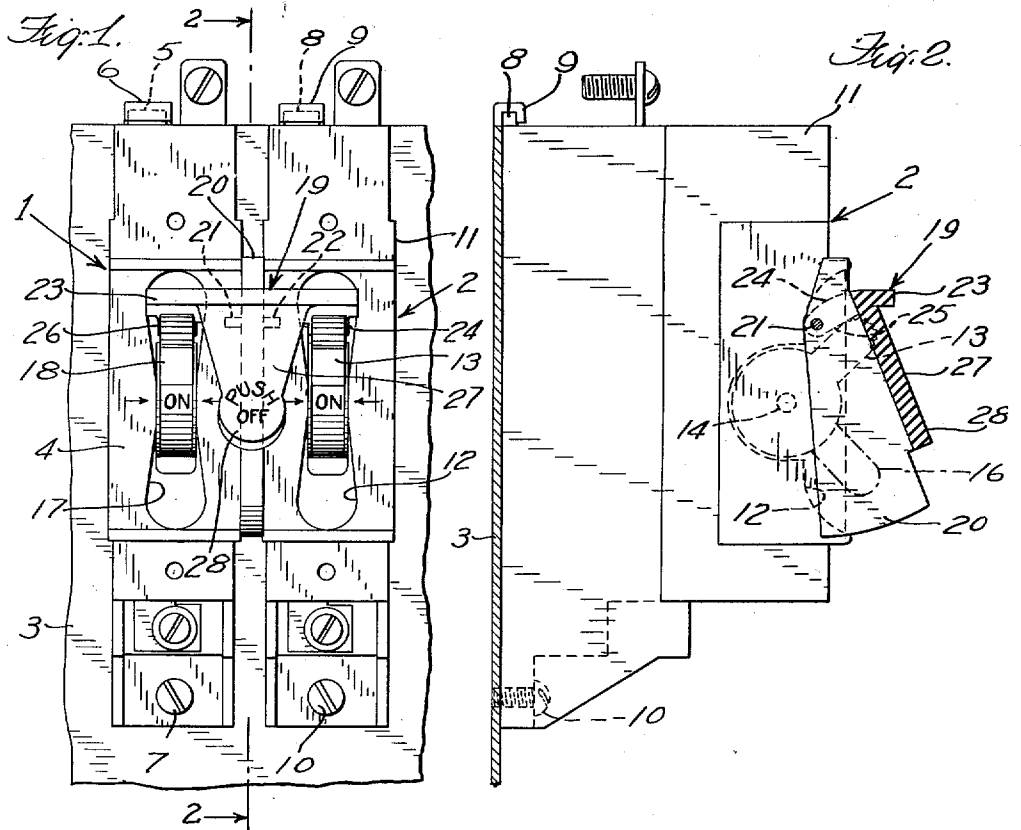
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2,601,638

CIRCUIT BREAKER

Filed Dec. 7, 1946

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

Fig. 4.

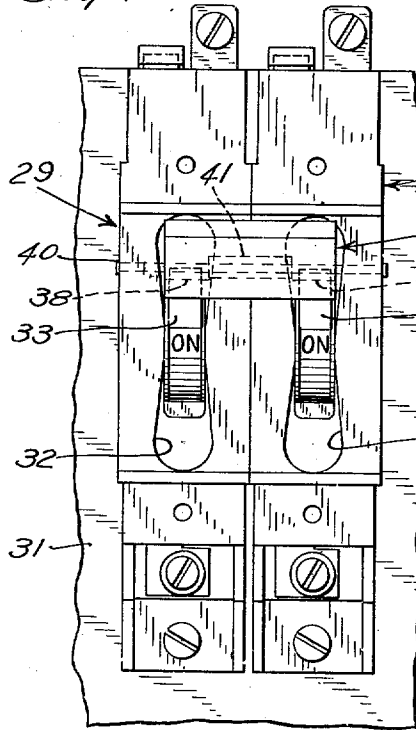


Fig. 5.

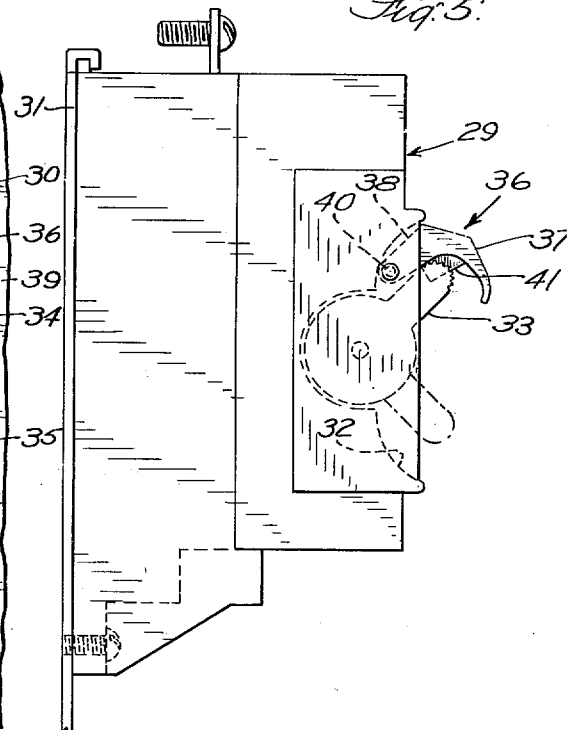
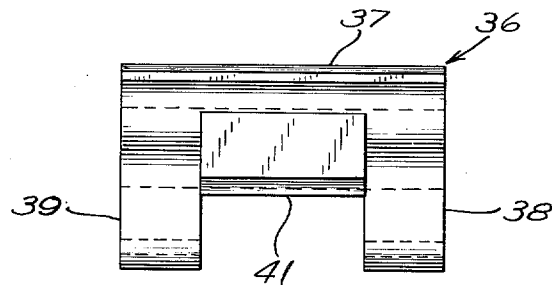


Fig. 6.



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UNITED STATES PATENT OFFICE

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CIRCUIT BREAKER

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3 Claims. (Cl. 200—18)

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The invention herein disclosed relates to a circuit breaker assembly consisting of a plurality, i. e. two or more, circuit breakers. More particularly, the invention relates to an arrangement for effecting the conjoint actuation of a plurality of circuit breakers mounted in a group.

In electrical installations in which individual circuit breakers are used for controlling a number of separate circuits, it is desirable that all circuits may, in case of emergency, be cut out by actuating a limited number of actuating elements. On the other hand, the circuit breakers should be individually and separately operable for the purpose of maintenance and repair.

The principal object of this invention is to provide a circuit breaker assembly that comprises a plurality of independently operable circuit breakers together with an actuating element which when actuated simultaneously effects operation of the plurality of circuit breakers to cut out the circuits controlled thereby.

The foregoing and other objects and certain advantages that will hereinafter appear are realized in the embodiments of the invention illustrated in the accompanying drawing and described in detail below, from which description a clearer understanding of the invention may be had.

The drawings include:

Fig. 1 which is a front elevation of a circuit breaker assembly embodying the invention;

Fig. 2 which is a sectional, side elevation of the same taken on the line 2—2 of Fig. 1;

Fig. 3 which is a rear elevation of an actuating element;

Fig. 4 which is a front elevation of a modified form of circuit breaker assembly embodying the invention;

Fig. 5 which is a side elevation of the same; and

Fig. 6 which is a rear elevation of a modified form of actuating element.

In Figs. 1 and 2 of the drawing, there are shown two circuit breakers 1 and 2 mounted in side by side relation on a panel 3. The circuit breaker 1 includes a case 4 having a lug 5 extending from one end thereof. The lug 5 is secured to the panel 3 by an inturned lip 6 formed on the panel. In the same manner, by a lug 8 and engaging lip 9 and a machine screw 10, the case 11 of the circuit breaker 2 is secured to the panel. The circuit breakers 1 and 2 are spaced apart approximately three-sixteenths of an inch.

The circuit breakers 1 and 2 are identical in

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construction. In the front face of the circuit breaker 2, there is a longitudinal, elongated groove 12. Through a slot extending into this groove, a finger piece or operating handle 13 extends. The operating handle is pivotally movable about a pivotal axis, indicated at 14, between an upper or "on" position as shown, and a lower or "off" position, indicated at 16 in broken lines in Fig. 2. Similarly, the face of the circuit breaker 1 has an elongated groove 17 therein through which an angularly movable operating handle 18 extends, movable between an upper or "on" position and a lower "off" position.

The particular circuit breakers illustrated are of the magnetically operated type and such that a movement of the operating handle of three-sixteenths to one-quarter of an inch from "on" towards "off" position frees an internal spring element and the operating handle is carried, by the spring element, all the way to the "off" position. On automatic release of the circuit breaker, as by an overload on the circuit, the operating handle also moves all the way to the "off" position. The circuit breaker is reset by moving the operating handle to the "on" position. Such circuit breakers are well known in the art. The internal construction and operating mechanism thereof form no part of this invention and, therefore, have not been illustrated.

Pivotally secured to the circuit breakers 1 and 2, there is a manually operable actuating element 19 positioned to engage the operating handles of both circuit breakers in the "on" positions thereof and effect the simultaneous movement of the handles to the "off" position. This actuating element, which may be molded as a single piece of thermo-plastic material or stamped from sheet metal, includes a central longitudinal barrier 20 that extends between and into the space between the circuit breakers 1 and 2. Pivots 21 and 22 extending from opposite sides of the barrier are received in blind holes in the adjacent sides of the cases 4 and 11 of the circuit breakers 1 and 2. In this way, the actuating element is pivotally mounted about an axis parallel to the pivotal axis of the operating handles 13 and 18.

A cross piece 23 extends from opposite sides of the barrier and over the operating handles 13 and 18. Adjacent one end of the cross piece 23, a lug 24 extends into the groove 12, behind the operating handle 13 in the "on" position thereof. This lug includes a handle engaging surface 25 which, when the cross piece 23 is

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moved downwardly, engages the handle 13 and moves it toward "off" position. A like lug 26 extends from adjacent the opposite end of the cross piece 23 and into the groove 17 behind the operating handle 18 in the "on" position thereof.

A finger piece or actuating plate 27 extends downwardly and outwardly from the cross piece 23, intermediate the ends thereof. This finger piece is formed integral with the edge of the barrier, but, as illustrated it is substantially wider than the thickness of the barrier. It is provided with an end portion 28 on which pressure may be exerted by the finger of an operator to move the actuating element 19 about its pivotal axis in a direction to move the cross piece 23 downwardly. With downward movement of the cross piece, the lugs 24 and 26 engage the handles 13 and 18, when they are in the "on" position, and move them a sufficient distance to release the spring elements that carry them to the "off" positions.

It should be observed that each of the circuit breakers is independently and separately operable both manually and automatically. There is no interference with their operation by the actuating element. With the operating handles of both circuit breakers in the "on" position, operation of the actuating element effects the simultaneous movement of both operating handles to the "off" position. The circuit breakers are thereafter reset in the usual manner, namely, by moving the handles to the "on" position. In the form of the actuating element illustrated the handles of the circuit breakers are accessible in the "on" positions thereof so that they may be separately actuated to "off" position. However, the cross piece 23 may be extended, at the front, and curved downwardly to render the handles inaccessible for individual operation to the "off" position. This arrangement is illustrated in conjunction with the modification illustrated in Figs. 4 and 5.

In Figs. 4 and 5, two circuit breakers 29 and 30 are shown mounted in side by side relation on a panel 31. These circuit breakers are arranged with the adjacent sides thereof in contact so that there is no space between them. The circuit breakers 29 and 30 are identical in all respects to the circuit breakers 1 and 2. In the face of the circuit breaker 29, there is an elongated, longitudinal groove 32 through which a pivotally mounted operating handle 33 extends. A like operating handle 34 extends through the face of the circuit breaker 30 which has an elongated groove 35 therein.

An actuating element 36 is utilized for effecting the conjoint operation of the circuit breaker handles from "on" to "off" positions. This actuating element may desirably consist of a single molded piece of thermo-plastic material. It includes a cross piece 37 from each end of which lugs 38 and 39 extend. The lug 38 extends into the groove 32 behind the operating handle 33 in the "on" position thereof, and the lug 39 extends into the groove 35 behind the operating handle 34 of the circuit breaker 30. A pivot pin 40 extends through both circuit breakers and the lugs 38 and 39 adjacent the ends thereof. The actuating element 36 is thus pivotally secured to the circuit breakers on an axis parallel to the pivotal axis of the operating handles 33 and 34. Between the handles 33 and 34, on the under side of the cross piece 37, there is a spacer block 41.

In the "on" position of the operating handles

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33 and 34, the cross piece 37 overhangs the ends of the handles. Thus, the handles are inaccessible for separate actuation from the "on" to the "off" position. However, the cross piece does not interfere with movement of a handle to the "off" position when the breaker operates automatically, as when there is an over load on the circuit. This arrangement is desirable in certain classes of loads. The burning action at the contacts is less severe on heavy loads or high voltage if two breakers simultaneously cut the line in two places, rather than one breaker interrupting the full voltage.

To manually operate the two circuit breakers from "on" to "off" position, it is only necessary to press downwardly on the cross piece 37. This moves the actuating element 36 about the pivot pin 40. The lugs 38 and 39 act on the handles 33 and 34 and move them a sufficient distance to release the spring elements within the breakers. The spring elements then carry the handles to the "off" position.

While in each of the embodiments of the invention illustrated in the drawings and described above only two circuit breakers have been shown in side by side relation, it will be readily apparent to those skilled in the art that any number of circuit breakers (within reason) may be assembled in a juxtaposed group and the actuating element extended to effect simultaneous operation thereof from the "on" to the "off" position. For this purpose, it is only necessary to provide additional actuating lugs properly spaced and coupled together.

It will be obvious that various other changes may be made by those skilled in the art in the details of the embodiments of the invention disclosed in the drawing and described above within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. A circuit breaker assembly comprising in combination two circuit breakers mounted in side by side relation, each circuit breaker having a pivotally mounted operating handle independently movable between "on" and "off" positions and resiliently movable to "off" position upon slight movement thereof from "on" position toward "off" position, and a manually operable, pivotally mounted actuating element for conjointly actuating the operating handles from "on" toward "off" position and including portions extending behind the operating handles of the circuit breakers only in the "on" positions thereof.

2. A circuit breaker assembly comprising in combination two circuit breakers mounted in side by side relation, each circuit breaker having a pivotally mounted operating handle independently movable between "on" and "off" positions and resiliently movable to "off" position upon slight movement thereof from "on" position toward "off" position, and a manually operable actuating element for conjointly actuating the operating handles of the circuit breakers from "on" toward "off" position, the actuating element being pivoted to the circuit breakers and including spaced lugs extending behind the operating handles of the circuit breakers only in the "on" positions thereof.

3. A circuit breaker assembly comprising in combination two circuit breakers mounted in side by side relation, each circuit breaker having an elongated slot in the face thereof and a pivotally mounted operating handle extending through the slot and movable between "on" and

"off" positions and resiliently movable to "off" position upon slight movement thereof from "on" to "off" position, the operating handles of the circuit breakers being independently movable between "on" and "off" positions, and a manually operable actuating element for conjointly actuating the operating handles of the circuit breakers from "on" toward "off" position, the actuating element being pivoted to the circuit breakers and including spaced lugs, one for each circuit breaker extending into the slot in the face of the circuit breaker behind the operating handle in the "on" position thereof.

ALBERT B. RYPINSKI.

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