Feb. 24, 1942. E. T. PLATZ 2,274,159

CIRCUIT BREAKER

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Fig. 1

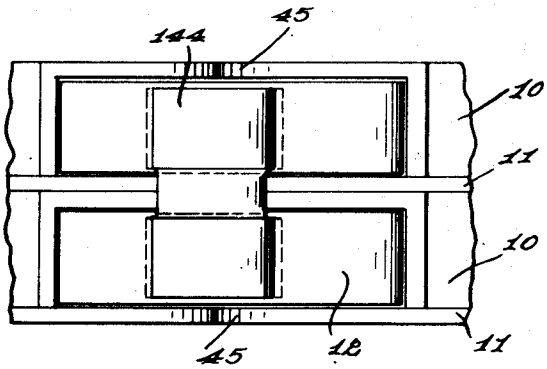


Fig. 2.

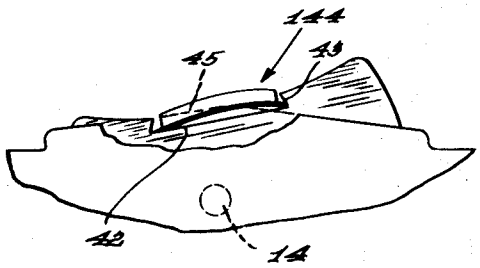
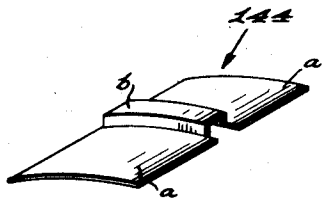


Fig. 3.



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Fig. 4.

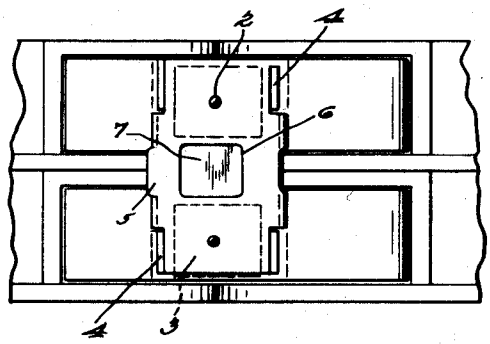


Fig. 5.

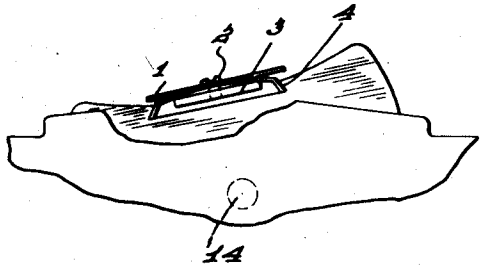
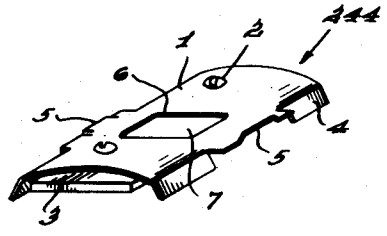


Fig. 6.



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UNITED STATES PATENT OFFICE

2,274,159

CIRCUIT BREAKER

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Application February 10, 1940, Serial No. 318,270

13 Claims. (Cl. 200—172)

This application relates to switches and more particularly to tie means for intersecuring adjacent switch handles whereby they may be moved as a unit.

In a prior application, Serial No. 302,783, filed November 3, 1939, there is disclosed a switch or circuit breaker having a casing 10 in which is a snap action rocker handle 12 for manipulating the contacts, with the handle being constructed to rock about a transverse pivotal axis 14 and to be manipulable only by a push on either end, and with the handle being so formed that it can not be gripped at either end for restraining its motion. The handle is formed with a transverse groove 42 on its face, parallel to the pivot axis 14, with the ends of the groove undercut as at 43.

The tie means hereof is primarily intended to be used with handles of the character just described when switches having such handles are disposed side by side, substantially as indicated in Fig. 1 of another pending application, Serial No. 232,806, filed October 1, 1938, which shows adjacent handles 12, each of a rocker type, and each pivoted on an axis 14.

For an understanding of the tie means herein disclosed, reference should be had to the appended drawings disclosing two embodiments of tie means of the invention. In these drawings,

Fig. 1 is a front view of part of a panel of switching units showing two units having their handles tied together by one form of tie means;

Fig. 2 is a side view of Fig. 1;

Fig. 3 shows the tie means of Figs. 1 and 2;

Fig. 4 is a view like Fig. 1 but showing a different form of tie means;

Fig. 5 is a side view of Fig. 4;

Fig. 6 shows the tie means of Figs. 4 and 5.

Referring to the drawings, it will be seen that these show two adjacent circuit controlling snap switches having casings 10 formed with open sides normally closed by side plates 11. The handles 12 are of the rocker type and are constructed to rock about the same pivotal axis, formed by aligned pivots 14, and are manipulable only by push on either end, being formed so that they can not be gripped at either end for restraining their motion. Handle motion may be initiated by push on either end of the handles, but is normally under the control of snap means, such as the springs disclosed at 21 in Serial No. 302,783, but which are not here disclosed, although it is understood that the switches hereof are snap switches having springs operating to bias the handles into either of their two extreme positions.

The handles have on their faces aligned transverse grooves 42 parallel to the pivot axis 14 with the ends of the groves undercut as at 43.

For connecting the handles so that they move as a unit two different forms of tie means have been disclosed and these will now be described.

The tie means of Figs. 1 to 3 consists of a strap referenced generally at 144 having portions "a" adapted to be disposed in the grooves 42 and a humped bridging portion "b" adapted to bridge adjacent sides of adjacent switches, the hump rigidifying the strap 144 as well as enhancing the appearance of the unit consisting of two handles tied by the strap.

The strap 144 is formed arcuately whereby it may be slid into the grooves 42, but only when the handles are forcibly restrained in a neutral position, between their extreme positions, so that the arc of the strap can clear the forwardly built up portions 45 of the casings which function to restrain the strap from sliding sidewise out of the grooves when the handles are in either of their two extreme positions.

Inasmuch as the switches are of the snap type, never remaining in their neutral positions, except when forcibly restrained so to do, there is no tendency or likelihood of the tie means sliding sidewise out of the grooves in normal operation.

In the embodiment of Figs. 4 to 6 the tie means is a resilient, arcuate strap referenced 244, and includes portions 1 adapted to be disposed in the grooves 42 of the adjacent handles and be restrained there when the strap is expanded endwise by threading down of the screws 2 into the plates 3 so as to bias the edges 4 of the strap into the undercut ends 43 of the handle grooves 42. Portions 5 of the strap are formed to clear portions 45 of the casings. A window 6 exposes a legend card 7 disposed between the strap and the plates 3.

The tie of Fig. 6, unlike the tie of Fig. 3, may be placed in adjacent handle grooves forwardly and need not slide into these handle grooves sidewise, however requiring manipulation of screws 2 for finally completing the operation of associating the tie with adjacent handles.

Now having described the tie means herein disclosed, reference should be had to the claims which follow:

I claim:

1. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned trans-

verse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the sides of the casings being built up to close the sides of the grooves and thus restrain the tie means from sliding sidewise out of said grooves when the handles are in either of their two extreme positions, the switches having snap means for biasing the handles into either of such two positions.

2. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the sides of the casings being built up to close the sides of the grooves and thus restrain the tie means from sliding sidewise out of said grooves when the handles are in either of their two extreme positions, the switches having snap means for biasing the handles into either of such two positions, with the proportions of the parts being such that when the handles are forcibly restrained in neutral positions, between their extreme positions, the tie means can slide into and out of said grooves sidewise.

3. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the sides of the casings being built up to close the sides of the grooves and thus restrain the tie means from sliding sidewise out of said grooves when the handles are in either of their two extreme positions, the switches having snap means for biasing the handles into either of such two positions, the tie means being resilient and so formed that normally it is contracted sufficiently to permit it to be entered into the grooves forwardly, and means for expanding the tie means so as to project its end edges into the ends of the grooves under spring tension for interlocking the tie means and the handles.

4. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the sides of the casings being built up to close the sides of the grooves and thus restrain the tie means from sliding sidewise out of said grooves when the handles are in either of their two extreme positions, the switches having snap means for biasing the handles into either of such two positions, the tie means being resilient and so formed that normally it is contracted sufficiently to permit it to be entered into the grooves forwardly, and means for expanding the tie means so as to project its end edges into the ends of the grooves under spring tension for interlocking the tie means and the handles, comprising plates disposed in back of the tie means and receiving shanks of screws threaded into them and having forwardly exposed heads.

5. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the sides of the casings being built up to close the sides of the grooves and thus restrain the tie means from sliding sidewise out of said grooves when the handles are in either of their two extreme positions, the switches having snap means for biasing the handles into either of such two positions, the tie means being resilient and so formed that normally it is contracted sufficiently to permit it to be entered into the grooves forwardly, and means for expanding the tie means so as to project its end edges into the ends of the grooves under spring tension for interlocking the tie means and the handles, comprising plates disposed in back of the tie means and receiving shanks of screws threaded into them and having forwardly exposed heads, the tie means having a window, and a legend card disposed between the plates and the tie means.

6. Adjacent exposed switch handles having forwardly open aligned grooves with undercut ends, and tie means in said grooves, with its ends in the undercut ends of the grooves so that the tie means is interlocked against forward removal accidentally from the grooves.

7. Adjacent exposed switch handles having forwardly open aligned grooves with undercut ends, and tie means in said grooves, with its ends in the undercut ends of the grooves so that the tie means is interlocked against forward removal accidentally from the grooves, and means comprising casing side walls for retaining the tie means against sidewise removal accidentally from the grooves.

8. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves.

9. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned trans-

verse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the tie means comprising a springy metal strap having an inherent tendency to expand, after being contracted, so that its ends remain in the undercut ends of the handle grooves.

10. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the tie means comprising a springy metal strap having an inherent tendency to contract and free its ends from the undercut ends of the grooves, and means manipulable for expanding the strap and holding it expanded so that its ends move into and remain in the ends of the grooves.

11. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, and means comprising casing side walls for retaining the tie means against sidewise removal accidentally from the grooves.

12. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the tie means comprising a springy metal strap having an inherent tendency to expand, after being contracted, so that its ends remain in the undercut ends of the handle grooves, and means comprising casing side walls for retaining the tie means against sidewise removal accidentally from the grooves.

13. In combination, two adjacent circuit controlling snap switches having casings, handles therein constructed to rock about aligned transverse pivotal axes and to be manipulable by a push on either end, and having aligned transverse grooves on their faces parallel to the pivot axes, with the ends of the grooves undercut, and a tie means for intersecuring the handles so that they move as a unit comprising a strap disposed in the grooves and extending across the handles and having its end edges disposed in the undercut ends of the grooves, the tie means comprising a springy metal strap having an inherent tendency to contract and free its ends from the undercut ends of the grooves, and means manipulable for expanding the strap and holding it expanded so that its ends move into and remain in the ends of the grooves, and means comprising casing side walls for retaining the tie means against sidewise removal accidentally from the grooves.

ELWOOD T. PLATZ.