

April 15, 1941.

F. C. DE REAMER

2,238,630

JACKKNIFE SWITCH

Filed Oct. 30, 1937

Fig. 1.

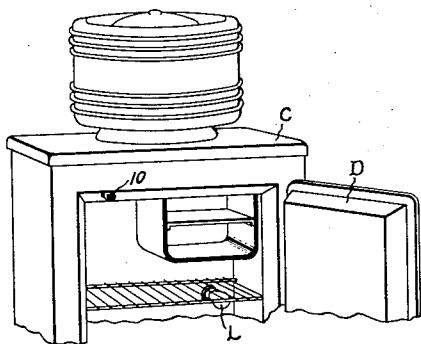


Fig. 2.

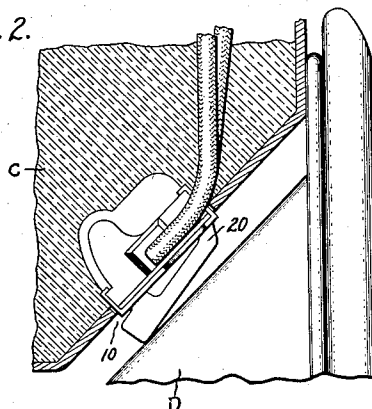


Fig. 3.

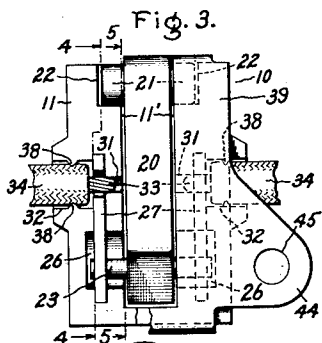


Fig. 4.

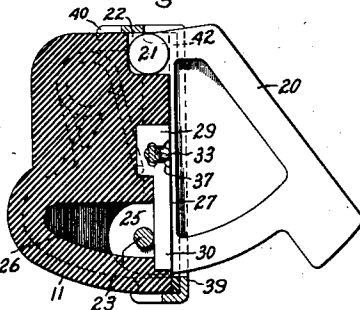


Fig. 5.

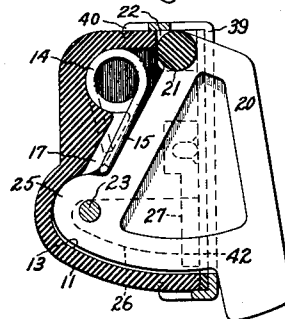


Fig. 6.

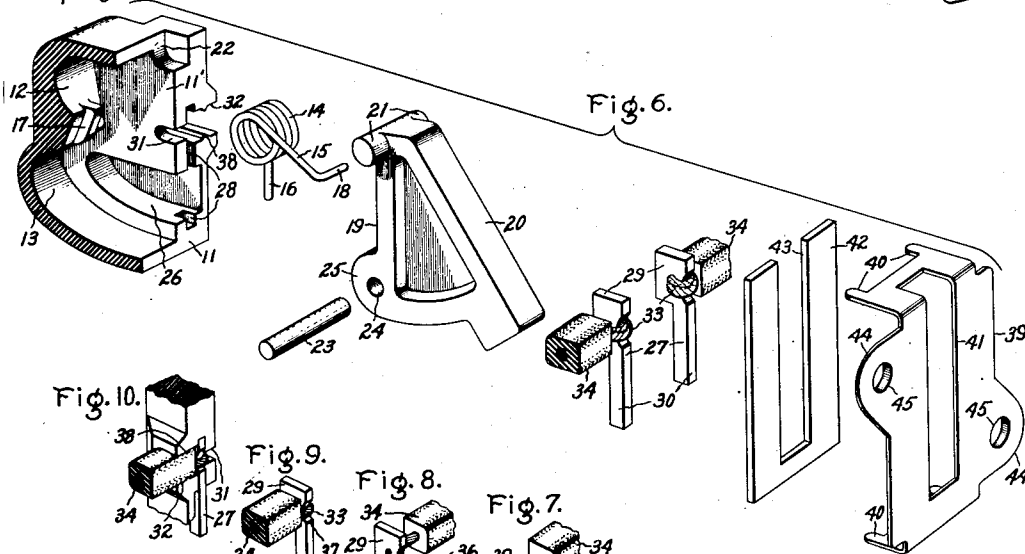


Fig. 10.

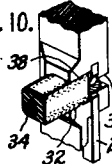


Fig. 9.

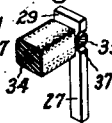


Fig. 8.

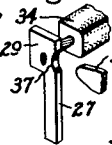
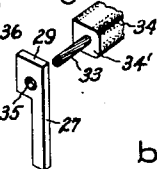


Fig. 7.



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UNITED STATES PATENT OFFICE

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JACKKNIFE SWITCH

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Application October 30, 1937, Serial No. 171,935

3 Claims. (Cl. 200—54)

This invention relates to switches of the jackknife type in which the contact means in the switch is held in normally open position against the action of a spring.

It is an object of this invention to provide an improved construction and arrangement in switches of this type which is simple in structure, capable of being manufactured at low cost, and is of pleasing appearance yet of rugged character to withstand constant use.

It is another object of this invention to provide an improved connecting means between an electric conductor and the switch contact means.

In the accompanying drawing Fig. 1 is an illustration of the application of the switch to a refrigerator cabinet; Fig. 2 is an enlarged view of the manner of mounting the switch in the portal of the cabinet; Fig. 3 is a front elevation of the switch assembly with a portion of the cover removed; Fig. 4 is a view on the section line 4—4 of Fig. 3, and shows the switch in closed position; Fig. 5 is a view on the section line 5—5 of Fig. 3 showing the switch in open position; Fig. 6 is an exploded view of the switch elements, and Figs. 7 to 10, inclusive, illustrate the manner in which the conductor is united with the switch contact.

Referring to the figures, the switch assembly 10 has a housing 11 formed of molded composition, or the like, which is provided with a slot 11' having an upper recess 12 and a lower recess 13 formed at the rear end thereof. Resting in the recess 12 is a coiled spring 14 having depending arms 15 and 16 which co-act with an abutment 17, formed on the housing between the recesses to hold the spring in operative position, as best shown by Fig. 5. The arm 15 is bent at an angle to form a projection 18 which engages the inner face 19 of a switch operating button 20 of segmental form which may be made of molded composition. In order to mount the button upon the housing, the button is provided with opposed pivots 21 which are seated in semi-circular recesses 22, formed in the housing 11, so that the button will oscillate in the slot 11' about the bearing points 22. The button 20 is provided with a contact pin 23 extending through an opening 24 formed in the projection 25 extending from the lower part of the housing, the projection being seated in the recess 13 when the switch is in open position. The ends of the pin 23 extend beyond the sides of the button and ride in recesses 26 as the button is oscillated to operate the switch.

Cooperating with the contact pin 23 are the contact members 27 which are mounted upon the housing in vertical grooves 28 formed on each side of the slot 11'. The contact members have head portions 29, adapted to be connected to electrical conductors, and blade portions 30 which stand in the path of movement of the pin 23 and with which the pin makes contact, as shown by Fig. 4. To provide for connection of the electrical conductors to the contact members, horizontal grooves 31 and 32 are provided on each side of the vertical grooves 28, the groove 32 being larger than the groove 31 to receive the insulation upon the conductors.

The method of connecting the electrical conductors to the contact members is shown by Figs. 7 to 10, inclusive. The conductor 33 is provided with the customary insulation 34 which, as shown in Fig. 7, is removed from a portion of the conductor so as to leave a smooth flat surface 34' at the end of the insulation. The head 29 of the contact member 27 is provided with an opening 35 through which the bared portion of the conductor is extended to a point flush with the side of the contact member. In order to secure the conductor in the opening the contact member is pressed against a staking punch 36 which forces the metal surrounding the conductor into gripping contact with the conductor so that the conductor is held securely within the opening. By squeezing the metal to grip the conductor and close the opening 35 a recess 37 is formed in the end of the contact member. The conductor is now bent around the contact member and is seated in the recess so that the flat surface 34' of the insulation is disposed against the side of the contact member, as shown in Fig. 9. The staking operation provides a tight connection between the contact member and the conductor and by bending the conductor back over the edge of the contact member a stress relieving structure is formed which prevents pulls on the conductor from loosening the connection. In order to mount the contacts on the housing, the contact members are inserted in the vertical grooves 28 with the bare conductors 33 resting in the horizontal grooves 31 and the insulated portion of the conductors resting in the grooves 32.

The grooves 32 are formed with transverse projections 38 which engage and depress the insulation 34 as it is inserted in the groove. The projections do not interfere with the insertion of the insulation in a direction parallel to their axes, but they prevent the insulation from being

pulled from the grooves in a direction transverse to their axes, such as would occur when a sudden pull is exerted upon the conductors of the assembled switch.

In order to hold the contact members 27, button 20 and spring 14 within the housing, a metallic cover 39 is provided to close the front of the housing and clamp these elements in position. The cover is clamped to the housing by means of the prongs 40 which are bent over to engage recesses (not shown) in the housing and, in addition, the cover is formed with a slot 41 which receives the button 20. To insulate the cover from the contacts 27 a barrier plate 42 having a slot 43 is interposed between the cover and housing and overlies each of the contacts with the button 20 oscillating within the slot 43. The cover 39 and plate 42 are maintained tightly against the face of the housing by the prongs 40 and hence cooperate with the recess 22 to form bearings for the pivots 21. It should be noted that the plate lies flat against the contact members with the recesses 37 punched in the contact members providing sufficient space for passage of the conductors, as shown in Fig. 4. In order to mount the switch, the cover is provided with projecting tabs 44 having openings 45 adapted to receive fastening means such as screws (not shown).

The switch is maintained in normally closed position by the action of the spring 14 which swings the button 20 outwardly until the pin 23 contacts the contact members 27 thereby limiting the outward movement of the button. When the pin makes contact with the contact members, a circuit across the contacts is formed. Interruption of the circuit occurs upon pressing the button inwardly against the action of the spring, the pin leaving the contact members and moving to the rear of the housing along the recesses 26.

One use of the switch is as a door switch to control an electric circuit in response to the opening and closing of a door. In this use the switch is mounted upon a door jamb by means of the

cover tabs 44, and the opening and closing of the door will then cause oscillation of the button 20 thereby moving the pin to make and break the circuit through the contacts. In Figs. 1 and 2 the switch is shown mounted upon the jamb of a refrigerator cabinet door D and may be connected to a lamp L in a refrigerator cabinet C so that as the refrigerator door is opened the lamp will be lighted.

What I claim as new and desire to obtain by Letters Patent of the United States is:

1. In a switch, a housing, said housing having a recess therein, contacts mounted in said housing in spaced relationship to each other, an operating button disposed between said contacts and having pivots mounted in said recess, a contact pin extending transversely of said button and extending on each side thereof to engage said contacts, and a cover for said housing overlying said recess and holding said pivots in position in said recess.

2. A switch comprising a housing having opposed vertical grooves formed therein and horizontal grooves intercepting said vertical grooves, contact arms mounted in said vertical grooves, conductors mounted in said horizontal grooves and connected to said contact arms, a pin engaging said contacts, a segmental button pivoted to said housing and carrying said pin thereon, and spring means within said housing operative to maintain said pin in engagement with said contacts.

3. In a switch, a housing having spaced grooves therein, contact members mounted in said grooves, each of said members having an opening and a recess formed therein, a conductor secured in each opening, said conductor being bent around the arm and disposed in said recess, an operating member pivoted in said housing, a pin carried by said member and adapted to engage said contacts and a cover overlying said contact members and said bent portions of said conductors and being secured to said housing to hold said contact members in position.

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