

May 25, 1943.

R. N. ROWE

2,319,906

CONTACT MECHANISM FOR ELECTRIC SWITCHES

Filed March 19, 1941

2 Sheets-Sheet 1

Fig. 1.

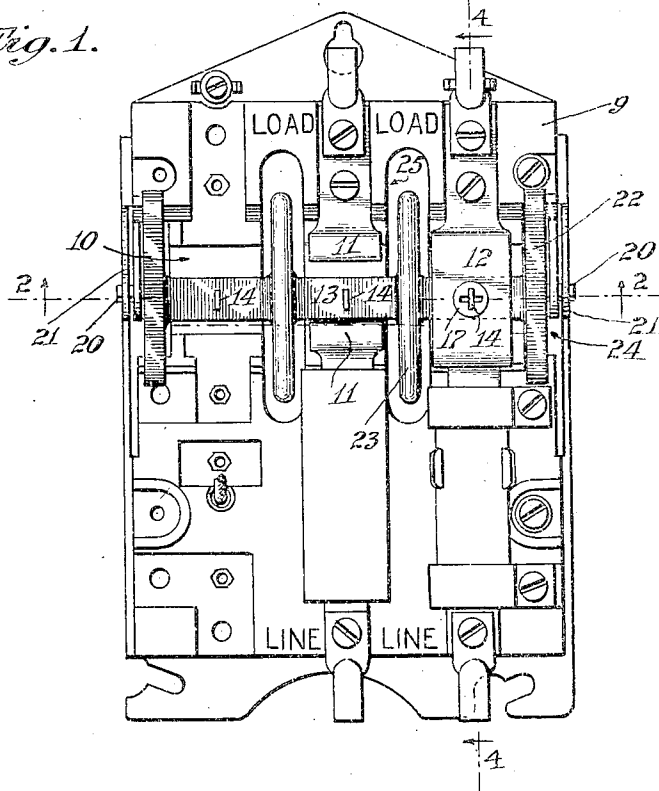
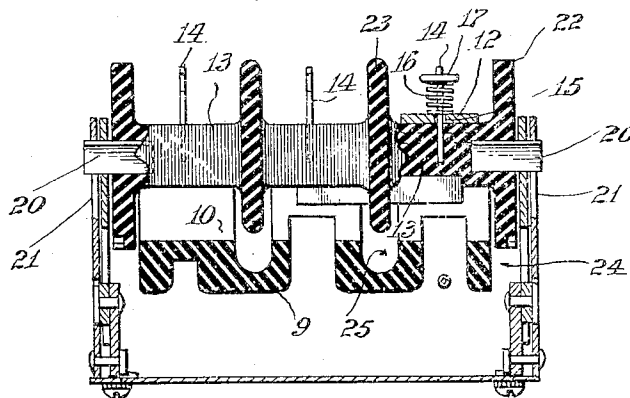
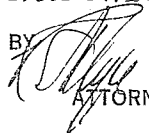


Fig. 2.



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Fig. 3.

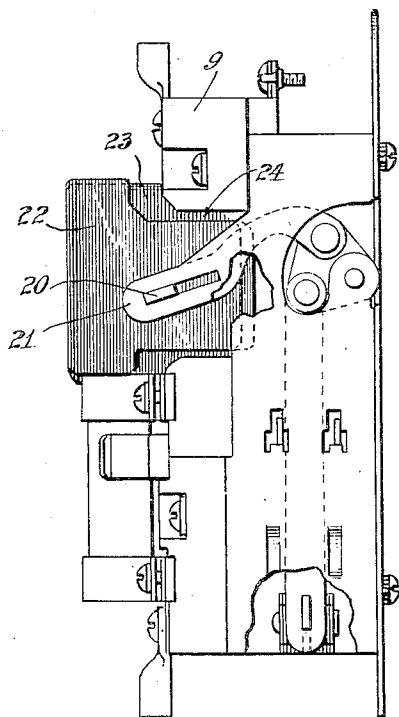


Fig. 4.

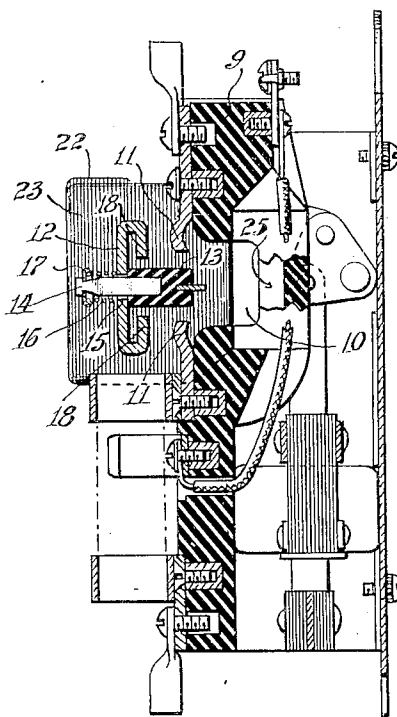


Fig. 6.

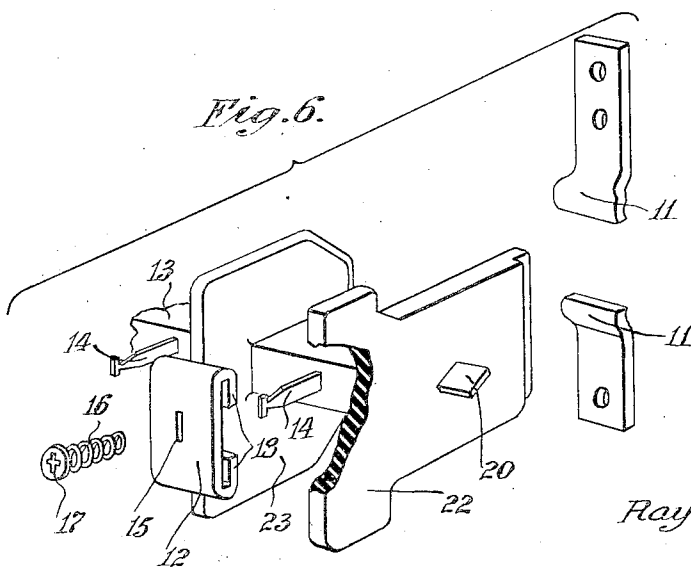
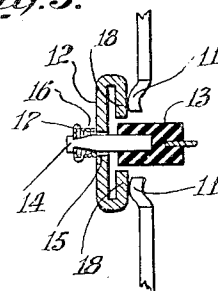


Fig. 5.



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UNITED STATES PATENT OFFICE

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CONTACT MECHANISM FOR ELECTRIC SWITCHES

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7 Claims. (Cl. 200—165)

This invention relates generally to electric switches and more particularly to the contact mechanism thereof.

A primary object of the invention is to provide switch contacts of simple construction having a high current interrupting capacity.

Another object is to provide an extremely compact and efficient double break switch.

The solution is found in providing a movable switch member having a flat body of stiff metal with its ends bent backwards beneath and closely adjacent the body portion to provide rigid contacting ends having flat contacting faces of substantial area.

This is used in connection with substantially flat stationary contacts with insulating barriers on each side of each pair of stationary contacts and an insulating barrier between the stationary contacts and the ends of the respective movable contacts to shield said contacts.

The invention is shown as applied to a switch of the type of the Getchell Patent No. 1,714,086.

Fig. 1 is a front view of one form of switch embodying my invention, parts being omitted.

Fig. 2 is a cross sectional view on the plane of the line 2—2 of Fig. 1.

Fig. 3 is a side view, with the switch in the open circuit position and parts being broken away.

Fig. 4 is a vertical sectional view on the plane of the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary side view and section showing contact parts in the closed circuit position.

Fig. 6 is an exploded perspective view showing switch contacts and part of the carrier for a movable switch member.

The invention is applicable to various types of switches, only one of which is shown and it will be necessary to describe only the parts involving my present invention.

The base 9 is formed of a suitable insulating material and has a recess 10. The stationary substantially flat contacts 11, 11 are mounted on opposite sides of the recess. The movable switch member 12 is supported by the insulating carrier bar 13 which has a guide member 14 extending through the slot 15. The spring 16 on member 14 is held in place by the cap 17 and presses the switch member toward the carrier bar.

The flat ends 18, 18 of the switch member 12 are bent back underneath and close to the main part on opposite sides of the center of the carrier bar 13.

Metal pieces 20, 20 are mounted on the oppo-

site ends of the carrier and project into slotted plates 21, 21 which serve as guides. Normally the weight of the movable switch parts holds the circuit open. Any suitable means may be employed to move the carrier bar upward and to the rear so as to force the ends of the switch member against the contacts. The carrier bar 13 moves into the recess 10 between the contacts 11, 11 and compresses the spring 16 as shown in Fig. 5.

The carrier has flanges 22 and 23 on opposite sides of the switch member 12 which move into grooves or recesses 24 and 25. When the carrier 13 is retracted the switch member 12 moves away from the stationary contacts and opens the circuit. The carrier extends between the ends 18, 18 so that the double breaking points are substantially enclosed.

In the form shown, there are three switch units suitably assembled. The various poles are shielded from each other. The devices have been found to approximately double the interrupting capacity of the switch. This is believed to be due to the rigid switch member with flat return bent ends coacting with the stationary contacts so that a magnetic field formed at the breaking of the current tends to distort and disrupt the arc which is forced toward the insulating walls between the stationary contacts and at the sides between the poles of the switch.

I claim:

1. An electric switch having an insulating base with a recess therein, a pair of contacts supported on the base at opposite sides of said recess and having substantial contact surfaces spaced apart, an insulating carrier mounted to move into said recess between said contacts, a movable rigid switch member resiliently mounted on said carrier and having flat contact portions of substantial area bent toward each other and spaced a short distance from the main part of the switch member on opposite sides of said carrier, said carrier having insulating flanges extending on opposite sides of said switch member, and means for moving the carrier into said recess between the contacts on the base and bringing the contact portions of the movable switch member against the contacts on the base, a portion of said insulating carrier being positioned as an arc barrier between said bent flat contact portions, whereby the formation of an arc directly between the contacts of said pair of contacts is inhibited.

2. In a switch of the kind described, the combination of substantially flat spaced stationary

contacts, an insulating carrier bar movable between said contacts, a contact member resiliently mounted on said carrier bar comprising a flat strip of rigid material and having flat end portions bent under said strip and adjacent and parallel thereto and positioned on both sides of said carrier bar so that a portion of said carrier bar is interposed as an arc barrier between said flat end portions, and means for moving said bent end portions into engagement with the stationary contacts.

3. In a switch of the kind described, the combination of spaced stationary contacts, an insulating carrier bar movable between said contacts, a contact member resiliently mounted on said carrier bar comprising a flat strip of rigid material and having flat end portions bent under said strip and adjacent and parallel thereto and positioned on both sides of said carrier bar, said carrier bar being positioned between said stationary contacts in all positions of the movable switch member and a portion of said carrier bar being positioned between said bent flat end portions of said movable contact member so as to function as an arc barrier and integral flanges on the carrier bar on opposite sides of said contact member.

4. In a multi-pole switch having an insulating base, insulating barriers between adjacent poles, and each pole having a pair of substantially flat stationary contacts separated by an insulating contact carrier when the circuit is opened, that improvement which consists of a movable switch member for each pole of the switch formed of a rigid flat sheet metal piece with integral flat ends bent under, parallel and close to the main body of the switch member, the stationary contacts for each pole extending in a plane parallel to the main body of the switch member and adapted to contact the bent under ends when the circuit is closed, said movable switch member also including an arc barrier of insulating material interposed between said bent ends of said flat sheet metal piece and engaging the central portion of the movable switch member immediately upon separating the ends of the movable switch member from the stationary contacts.

5. A switch including two discrete stationary contacts, a movable bridging contact including a single rigid metallic strip having the ends thereof bent beneath the main body thereof so as to lie parallel and relatively close to said body, but separated therefrom by an air space, an insulating arc barrier interposed at all times between said stationary contacts and between the ends of the movable bridging contact, and means for moving said bridging contact so as to make a substantially linear contact with each of said stationary contacts.

6. In a switch of the type employing a movable bridging contact in cooperation with a plurality of stationary contacts for each line circuit to be made and broken, a bridging contact including a rigid metallic strip formed with integral ends bent back so as to be positioned substantially parallel and closely adjacent to, but not touching the main body thereof, each end being adapted to make substantially linear contact with a stationary contact, and an insulating arc barrier positioned between said ends so as to keep completely discrete the arcs formed at the respective ends when opening said switch, said insulating arc barrier extending between the stationary contacts.

7. In a switch, a pair of stationary contacts having substantial contact areas spaced apart from each other and a movable switch member comprising an insulating carrier movable between said contacts, a switch member coacting with said stationary contacts and mounted on said carrier and formed of a rigid piece of metal having a central portion and two end portions integral therewith and bent toward each other but leaving spaces between the end portions and the central portion, a spring normally pressing the central portion against the carrier when the circuit is open, said spaces being open at opposite sides of said carrier, said carrier being interposed at all times between the stationary contacts and the ends of the movable switch member while the circuit is being opened.

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