

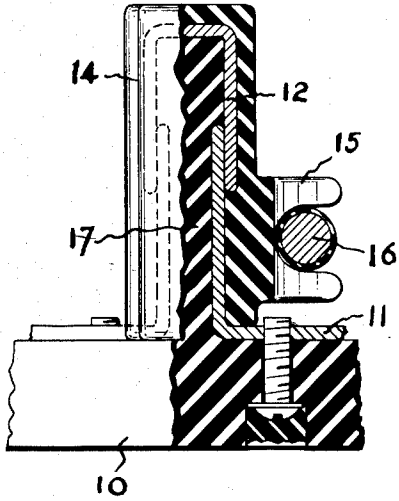
Dec. 6, 1938.

W. H. FRANK ET AL

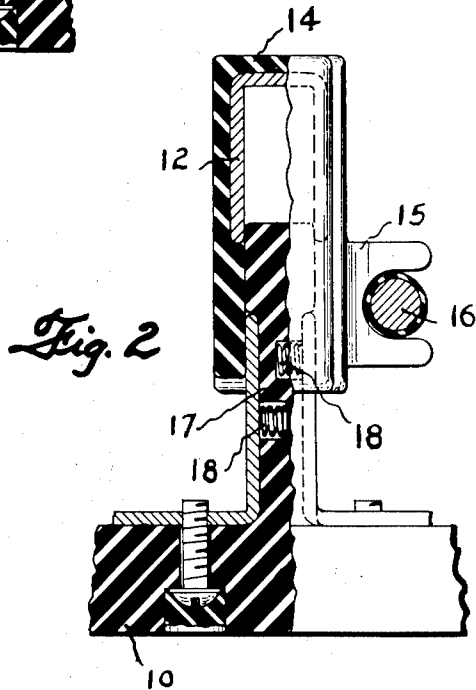
2,139,074

CONTACT SET

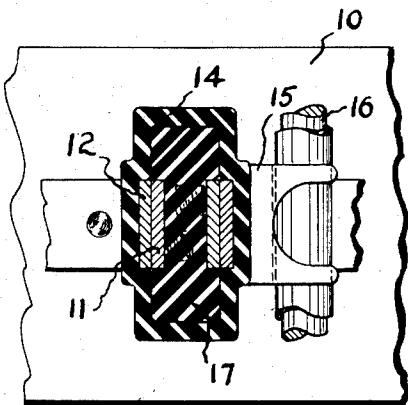
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*Fig. 1*



*Fig. 2*



*Fig. 3*

*William H. Frank +*  
*Lawrence E. Fisher* INVENTORS

BY *Daniel G. Kullen*

ATTORNEY.

# UNITED STATES PATENT OFFICE

2,139,074

## CONTACT SET

William H. Frank and Lawrence E. Fisher,  
Detroit, Mich.

Application April 17, 1936, Serial No. 74,909

4 Claims. (Cl. 200—163)

This application relates to contact sets and more particularly to contact sets especially useful in switches such as the one disclosed in application Serial No. 37,291, filed August 22, 1935, by Lawrence E. Fisher and William H. Frank, which application discloses a switch having stationary contacts adapted to be bridged by movable contacts supported in insulation housings having lugs associated with an operating bail which may be moved by suitable switch mechanism to reciprocate the housings and the movable contacts therein towards and from the stationary contacts.

In the contact sets of the switch disclosed in the application aforesaid, the movable contacts are in the nature of slugs adapted to be projected into the space between the stationary contacts, these being separated by a barrier formed as part of the housing, in which barrier is mounted the movable contact. In the contact set of the instant application, the movable contact is not in the form of a slug adapted to be projected into the space between the stationary contacts, but is in the form of a U-shaped piece adapted to embrace the stationary contacts and bridge them, and the barrier normally separating the stationary contacts is not formed as part of the movable housing but instead is formed as a part of the stationary base mounting the stationary contacts.

For an understanding of the contact set herein disclosed reference should be had to the appended drawing and the annexed specification. In this

Fig. 1 is an elevation section of the contact set hereof shown in "on" position;

Fig. 2 is a similar view with the parts shown in "off" position;

Fig. 3 is a plan section.

Referring to the drawing it will be seen that the contact set hereof includes a base 10 of insulation upon which are mounted stationary contacts 11. For bridging the stationary contacts there is provided a movable contact 12 supported in the insulation housing 14 which is provided with lugs 15 through whose slots passes the bight of an operating bail 16 journaled in opposite sides of a switch box containing the contact set and operated by a suitable switch mechanism.

The movable contact 12 is in the nature of a U-strap carried by and within the housing and is arranged to embrace the stationary contacts and connect them when moved down into the "on" position as indicated in Fig. 1.

Formed as part of the base 10 is a barrier 17

disposed between the stationary contacts and arranged to project beyond the free ends and the edges of the same, as illustrated in the drawing.

The contacts need not be locked in the barrier recesses seating in the contacts but may be resiliently formed and loosely seated in these recesses so as to be urged towards the movable contact by springs 18 (Fig. 2) also seated in the barrier for enhancing contact pressure. Since the open end of the housing never clears the free ends of the stationary contacts, the movement of the contacts 11 is limited by the housing.

The stationary structure, comprising the stationary contacts, and the barrier, forms a piston-like post constantly closing the open end of the cup-like cylinder comprising the housing, and its contact 12; consequently, reciprocation of the housing away from the base, for switch opening, causes the atmosphere within the housing to be exhausted to a greater or lesser extent, depending upon the seal between the open end of the housing and the post, and inasmuch as the seal between these parts is made as air-tight as practical, there is formed within the housing, or switch opening, a partial vacuum which is effective in minimizing arcs incident to switch opening, in certain cases preventing completely the formation of arcs incident to switch opening.

Since the barrier continues beyond the free ends of the stationary contacts, any arc that might be formed between the tips of the stationary and movable contacts on contact separation is localized and prevented from being drawn out by the presence of the free end of the stationary barrier.

While in general the operation and advantages of the contact set here indicated is substantially like that of the contact set disclosed in the application aforesaid, it will be observed that the construction of the contact set herein indicated is somewhat different from that of the earlier disclosed contact set. Firstly, the movable contact disposes itself outside of the stationary contacts, rather than between them, and secondly, the barrier between the stationary contacts is formed as part of the stationary base, rather than as part of the movable contact housing.

In addition, it will be observed that inasmuch as the surfaces of the stationary contacts which are engaged by the movable contacts are outside surfaces, they are visible on every switch opening and consequently they might be inspected and checked in order to assure users of

switches having these contact sets that satisfactory wiping contact on contact make takes place.

Furthermore, inasmuch as the stationary contacts are backed by the barrier between them, they are more rigid than might otherwise be the case and are consequently less susceptible to damage and injurious deflection than might be the case were the stationary contacts not so backed, as is the case with the stationary contacts of the earlier disclosed contact sets.

Now having described a contact set of the invention, reference should be had to the claims which follow for a determination of the protection sought herein.

We claim:

1. A switch including a stationary piston comprising a post of insulation having one end anchored and one end free, the piston having separate permanently connected laterally spaced contacts on the side wall thereof, a cylinder disposed over the free end of the piston and closed at all parts except for an open end thereof, which end is normally and constantly closed and sealed by the piston, with the interior of the cylinder and the outside of the piston being so proportioned relatively that the cylinder interior wall wipes the piston side wall, the cylinder closely and completely surrounding the piston, a contact in the cylinder arranged to wipe the contacts of the piston on their outer surfaces and bridge them, the piston contacts terminating short of the cylinder closing end of the piston, and the cylinder contacts terminating short of the piston closed end of the cylinder, the side wall of the piston, at its free end, being proportioned to be wiped by the cylinder contact on relative separation of the contacts.

2. A switch including a stationary piston comprising a post of insulation having one end anchored and one end free, the piston having separate permanently connected laterally spaced contacts on the side wall thereof, a cylinder disposed over the free end of the piston and closed at all parts except for an open end thereof, which end is normally and constantly closed and sealed by the piston, with the interior of the cylinder and the outside of the piston being so proportioned relatively that the cylinder interior wall wipes the piston side wall, the cylinder closely and completely surrounding the piston, a contact in the cylinder arranged to wipe the contacts of the piston on their outer surfaces and bridge them, the piston contacts terminating short of the cylinder closing end of the piston, and the cylinder contacts terminating short of the piston closed end of the cylinder, the dimensions and proportions of the piston and cylinder being such that the piston fills substantially the entire volume of the cylinder when they are telescoped completely, the side wall of

the piston, at its free end, being proportioned to be wiped by the cylinder contact on relative separation of the contacts.

3. A switch including a stationary piston comprising a post of insulation having one end anchored and one end free, the piston having separate permanently connected laterally spaced contacts on the side wall thereof, a cylinder disposed over the free end of the piston and closed at all parts except for an open end thereof, which end is normally and constantly closed and sealed by the piston, with the interior of the cylinder and the outside of the piston being so proportioned relatively that the cylinder interior wall wipes the piston side wall, the cylinder closely and completely surrounding the piston, a contact in the cylinder arranged to wipe the contacts of the piston on their outer surfaces and bridge them, the piston contacts terminating short of the cylinder closing end of the piston, and the cylinder contacts terminating short of the piston closed end of the cylinder, the side wall of the piston, at its free end, being proportioned to be wiped by the cylinder contact on relative separation of the contacts, the piston contacts having exposed terminals at the ends thereof near the anchored end of the piston to which stationary conductors may be permanently and immovably connected.

4. A switch including a stationary piston comprising a post of insulation having one end anchored and one end free, the piston having separate permanently connected laterally spaced contacts on the side wall thereof, a cylinder disposed over the free end of the piston and closed at all parts except for an open end thereof, which end is normally and constantly closed and sealed by the piston, with the interior of the cylinder and the outside of the piston being so proportioned relatively that the cylinder interior wall wipes the piston side wall, the cylinder closely and completely surrounding the piston, a contact in the cylinder arranged to wipe the contacts of the piston on their outer surfaces and bridge them, the piston contacts terminating short of the cylinder closing end of the piston, and the cylinder contacts terminating short of the piston closed end of the cylinder, the dimensions and proportions of the piston and cylinder being such that the piston fills substantially the entire volume of the cylinder when they are telescoped completely, the side wall of the piston, at its free end, being proportioned to be wiped by the cylinder contact on relative separation of the contacts, the piston contacts having exposed terminals at the ends thereof near the anchored end of the piston to which stationary conductors may be permanently and immovably connected.

WILLIAM H. FRANK.  
LAWRENCE E. FISHER.