Sept. 30, 1952 E. N. JACOBI 2,612,577

TERMINAL AND CONTACT CONSTRUCTION FOR ELECTRIC SWITCHES

Filed Nov. 9, 1949

Fig. 1.

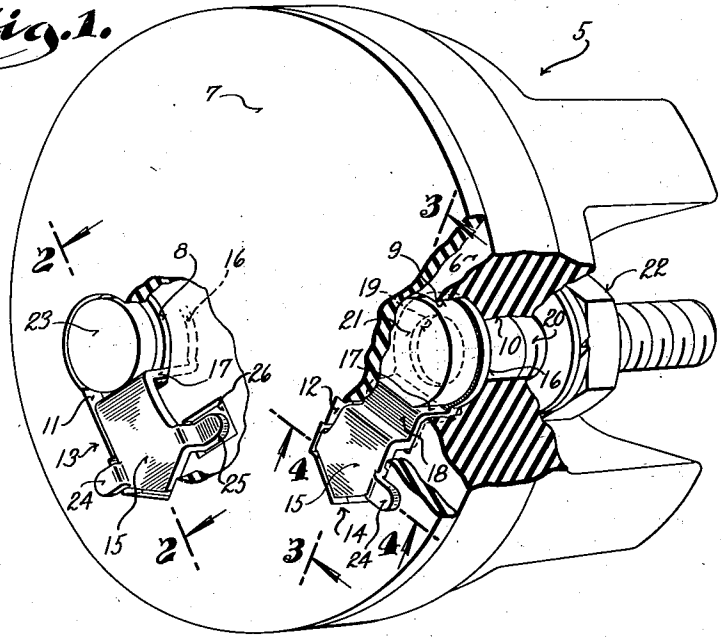


Fig. 2.

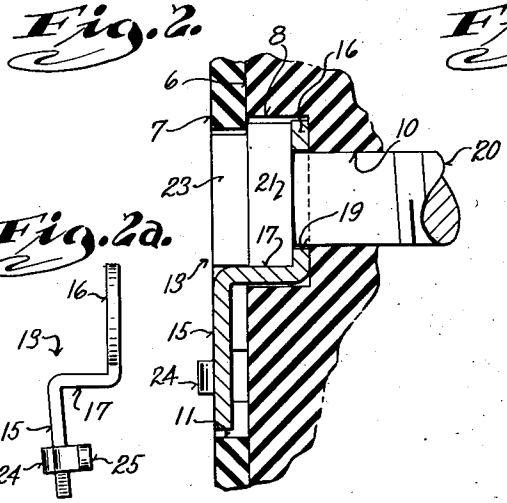


Fig. 2a.

Fig. 3.

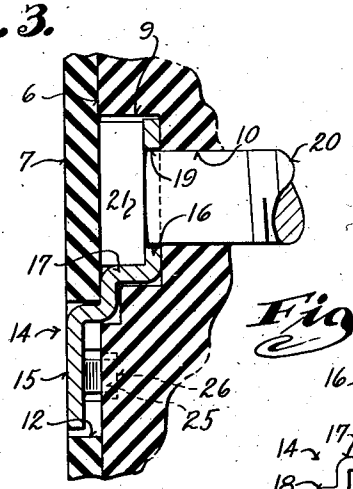


Fig. 3a.

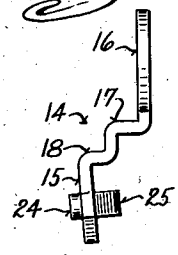
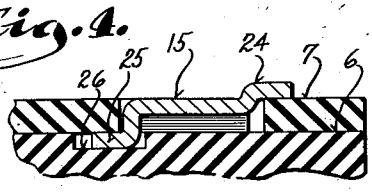


Fig. 4.



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TERMINAL AND CONTACT CONSTRUCTION FOR ELECTRIC SWITCHES

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Application November 9, 1949, Serial No. 126,356

6 Claims. (Cl. 200—166)

1

This invention relates to electric switches and refers more particularly to a terminal and contact construction for switches of the type forming the subject matter of the copending application of Edward N. Jacobi, Serial No. 123,709, filed October 26, 1949.

One of the objects of this invention is to provide a simple, inexpensive contact and terminal construction for such switches which assures good electrical contact between the terminal and the contact per se and which also facilitates the use of a separate surface disc for the terminal head.

Another object of this invention is to provide an improved contact and terminal construction which is so constructed and designed as to assure that the faces of the contacts will be absolutely flush with the face of the terminal head across which the contactor moves. This is particularly important in switches of the type disclosed in the aforesaid copending application wherein the contactor is spring propelled as well as manually actuated.

Another object of this invention is to provide a contact and terminal which will facilitate assembly of the switch in that it serves to hold the entire terminal head assembly together as it is handled from operation to operation prior to fastening the head in the switch case.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a perspective view of a terminal head assembly embodying this invention, parts thereof being broken away and in section to illustrate details;

Figure 2 is a sectional view taken through Figure 1 on the plane of the line 2—2;

Figure 2A is a side view of the contact member shown in Figure 2 but illustrating the same prior to its assembly with the terminal head;

Figure 3 is a sectional view taken through Figure 1 on the plane of the line 3—3;

Figure 3A is a side view of the contact member shown in Figure 3 but illustrating the same in its normal free condition prior to assembly with the terminal head; and

2

Figure 4 is a sectional view through Figure 1 on the plane of the line 4—4.

Referring now particularly to the accompanying drawing the numeral 5 designates a terminal head molded of suitable insulating material and having a flat front face 6 covered by a disc 7. The disc 7 is stamped from insulating material having high wear resistance and provides the stationary contact face across which the movable contactor (not shown) of the switch rotates.

The molded terminal head 5 has two cavities 8 and 9 formed therein and extending in from its front face 6, and leading from the bottom of each of these cavities is a hole 10 which extends all the way through the terminal head. The disc 7 has two holes 11 and 12 punched therethrough and located to be adjacent to the cavities 8 and 9 respectively when the disc is in place. These holes 11 and 12 and their adjacent cavities 8 and 9 accommodate contact members 13 and 14 respectively.

Both contact members are stamped and formed from sheet metal and are essentially of the same construction, each having a flat contact portion 15 and a flat attaching portion 16 offset from one another and connected by an intermediate portion 17. In the case of the contact member 14 the intermediate portion 17 is stepped to provide a shoulder 18.

As formed, the contact members have their contact portions 15 bent slightly rearwardly toward the plane of their attaching portions as shown in Figures 2A and 3A, the inclination being exaggerated in these figures. Actually the angle defined by the planes of the contact and attaching portions is only about two degrees. The purpose of this angular disposition of the contact portions is to place the contact members under slight tension upon assembly with the terminal head and thereby insure the desired flush relationship between the contact portions and the exposed front face of the disc 7.

The extent of the offset between the contact and attaching portions 15 and 16 is such that with the attaching portion firmly engaging and held against the bottom of the cavity the outer face of the contact portion is in position to be perfectly flush with the exposed outer face of the disc 7.

The attaching portions have holes 19 which register with the holes 10 when the contact members are in place and headed studs 20 are passed through these registering holes with the under-

side of the heads 21 thereof bearing against the attaching portions and holding them firmly against the bottom of the cavity. The opposite threaded ends of the studs 20 protrude from the back of the terminal head and have nuts 22 threaded thereon, by which the studs are secured in place. The threaded end portions, of course, provide the terminal posts for their associated contacts.

The heads 21 of the studs are of a height to have their outer faces flush with the front face 6 of the terminal head and in the case of the stud for the contact member 14 the disc 7 overlies the head as clearly shown in Figure 3, whereas the stud which holds the contact member 13 in place has a contact portion 23 formed on its head to extend through the disc 7 and lie opposite the contact portion 15 and in effect constitute a continuation thereof. To this end the contact portion 23 has a height equal to the thickness of the disc 7.

The contact portions 15 of both contact members have lugs or ears 24 and 25 projecting from opposite sides thereof. These lugs or ears are offset with respect to one another and the former is positioned to engage the outer face of the disc 7 while the latter engages the underside thereof, a pocket or cavity 26 being provided in the face of the terminal head to accommodate the same. Hence, the lugs or ears 24 and 25 coact to hold the contact portions 15 with their outer contact surfaces flush with the outer exposed face of the disc 7 and since the slight angular disposition of the contact portions 15 shown in Figures 2A and 3A slightly tensions the contact members in the direction to bias their contact portions downwardly, the overlying lugs or ears 24 firmly hold the disc 7 against the face 6 of the terminal head when the studs 20 are secured in place.

It follows, therefore, that by virtue of the novel construction of the contact members the terminal head assembly will be held together as it is handled from one operation to the other and until it is incorporated in the complete switch assembly at which time the disc 7 is clamped between a shoulder in the switch case and the terminal head 5, the terminal head being secured to the switch case by having an edge portion of the case clinched thereover.

In assembly, the lugs or ears 24 and 25 are passed through the holes 11 and 12 in the disc with the studs assembled therewith. Then as the studs are passed through the holes in the molded terminal head the lugs or ears hold the disc in place until the molded terminal head and disc are clamped together by the nuts threaded on the studs. This obviates the need for a rivet or other fastening means for securing the disc to the molded terminal head.

It is, of course, to be understood that the lugs or ears 24 which overlie the exposed face of the disc 7 lie outside the path or track of the movable contacts.

From the foregoing description taken in connection with the accompanying drawing it will be readily apparent to those skilled in the art that this invention provides a greatly improved contact and terminal for electric switches, and one especially well adapted for use with switches of the type illustrated in the aforesaid copending application wherein it is important that the stationary contact face be perfectly smooth and free from any obstruction that might interfere with spring propelled rotation of the contactor.

What I claim as my invention is:

1. In an electric switch: a terminal head having a hole therethrough for the reception of a terminal post; a disc of insulating material lying against the terminal head and providing a flat face therefor, said disc having a hole therethrough, offset laterally with respect to the hole in the terminal head, for the reception of a contact; a metal contact member having offset substantially parallel contact and attaching portions, the former being nested within the hole in the disc with one face thereof flush with the exposed face of the disc, and the latter lying on a plane beneath the disc and having a hole registering with the hole in the terminal head; a headed stud passing through said registering holes with the underside of its head bearing against the attaching portion to hold the same against the terminal head and with its other end protruding from the terminal head to provide a terminal post; and a lug extended from the contact portion and engaging over the exposed face of the disc to hold the disc assembled with the terminal head.

2. The structure set forth in claim 1 further characterized by the fact that said lug is one of a pair of lugs on the contact portion at opposite sides thereof each offset from the contact portion a distance such that the space between the planes defined by their inner faces is substantially equal to the thickness of the disc and engaging opposite sides of the disc to hold said face of the contact portion flush with the exposed face of the disc.

3. The structure set forth in claim 2 further characterized by the fact that the contact portion of the contact member is biased toward the plane of the attaching portion so that by clamping the attaching portion against the terminal head the contact portion is flexed to maintain said disc engaged with the terminal head under a degree of tension.

4. In an electric switch: a terminal head having a flat surface and having a cavity opening to said flat surface and a hole leading from the bottom of the cavity and extending through the terminal head; a disc of insulating material overlying and flatwise engaged with said surface of the terminal head, said disc having a hole therethrough, offset laterally with respect to the hole in the terminal head, for the reception of a contact; a stamped and formed sheet metal contact member having offset substantially parallel flat contact and attaching portions, the former being set into the hole in the disc and the latter being received in and overlying the bottom of the cavity in the terminal head and having a hole registering with the hole in the terminal head; a headed stud passing through said registering holes and secured to the terminal head with the underside of its head bearing against the attaching portion to hold the same against the bottom of the cavity in the terminal head and with the other end of the stud protruding from the terminal head to provide a terminal post; and lugs extending from the contact portion and engaging the opposite sides of the disc to hold the contact portion with its outer face flush with the outer exposed face of the disc and to hold the disc against and assembled with the terminal head.

5. In an electric switch: a terminal head having a flat surface and having a cavity opening to said flat surface and a hole leading from the bottom of the cavity and extending through the terminal head; a disc of insulating material

overlying and flatwise engaged with said surface of the terminal head, said disc having a hole therethrough offset laterally with respect to the hole in the terminal head for the reception of a contact; a stamped and formed sheet metal contact member having offset substantially parallel flat contact and attaching portions, the former being set into the hole in the disc and the latter being received in and overlying the bottom of the cavity in the terminal head and having a hole registering with the hole in the terminal head; a headed stud passing through said registering holes and secured to the terminal head with the underside of its head bearing against the attaching portion to hold the same against the bottom of the cavity in the terminal head and with the other end of the stud protruding from the terminal head to provide a terminal post; a lug extending from the contact portion and engaging the underside of the disc to hold the contact portion against outward displacement with respect to the disc; and means on the contact portion engaging the exposed face of the disc for holding the disc against and assembled on the terminal head, said means coacting with the lug to hold the contact portion with its outer surface flush with the outer exposed surface of the disc.

6. In an electric switch: a terminal head having a flat surface and having a cavity opening to said flat surface and a hole leading from the bottom of the cavity and extending through the terminal head; a disc of insulating material overlying and flatwise engaging said surface of the terminal head, said disc having a hole therethrough partly in line with and partly laterally offset from the hole in the terminal head; a stamped and formed sheet metal contact member having offset substantially parallel flat contact and attaching portions, the former occupying the offset portion of said hold in the disc and the latter being received in and overlying the bottom of the cavity in the terminal head and having a hole registering with the hole in the terminal head; a headed stud passing through said registering holes and secured to the terminal head with the underside of its head bearing against the attaching portion to hold the same against the bottom of the cavity in the terminal head and with the other end of the stud protruding from the terminal head to provide a terminal post; a contact portion on the head of the stud occupying the aligning portion of the hole in the insulating disc, the end surface of said contact portion on the head of the stud being flat and flush with the outer exposed surface of the disc; and lugs extending from the contact portion of said contact member and engaging the opposite sides of the disc to hold said contact portion with its outer face flush with the outer exposed face of the disc and to hold the disc against and assembled with the terminal head, whereby said contact portion of the stamped contact member and the contact portion on the head of the stud together constitute one stationary contact for the switch.

EDWARD N. JACOBI.

REFERENCES CITED

The following references are of record in the file of this patent:

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