

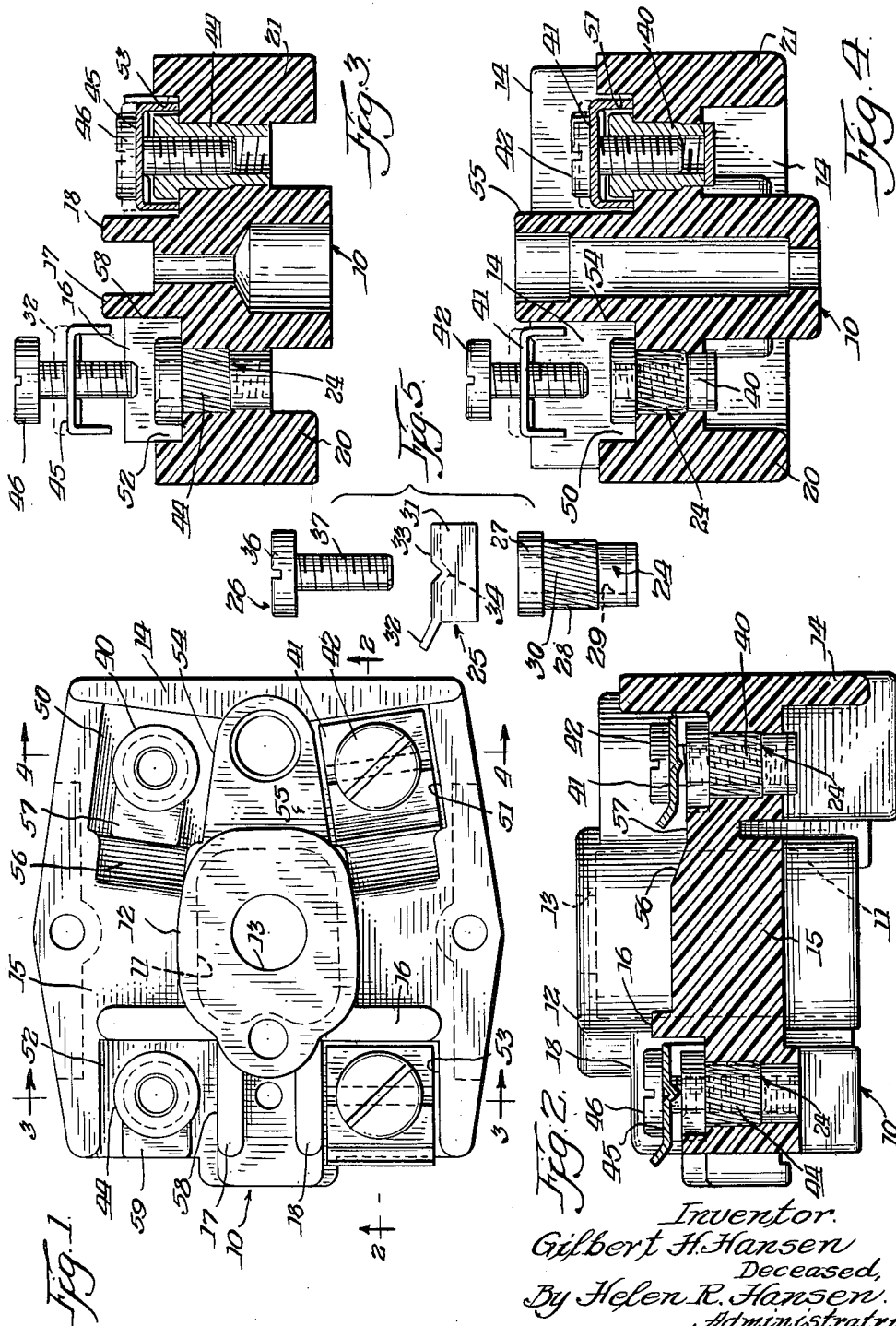
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TERMINAL ASSEMBLY

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TERMINAL ASSEMBLY

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The invention relates in general to electric switches and has reference in particular to the terminal board of an electric switch and to improvements in the terminal structure thereof.

In Patent No. 2,790,870 granted April 30, 1957, and entitled Fluid Pressure Actuated Switch, the terminal board of the switch unit is provided with front and rear sets of contacts which are closed by a fluid actuated stirrup and opened by an adjustable helical main spring. In order to make an electrical connection to one of the terminals of the switch unit of this patent it is necessary to clean and loop an end of the wire to be connected, and after removing the terminal screw completely, the removed screw is placed through the loop and the parts are then reassembled. To make a connection to terminal structure embodying the improvements of the invention it is only necessary to insert the cleaned end of the wire under the loosened saddle-shaped pressure plate and by retightening the holding screw the connection is completed.

Accordingly an object is to provide new and novel improvements in the terminal structures of an electric switch, which will be simple in design, economical to manufacture, and which will materially simplify the operation of connecting wires to the said terminal structures.

Another object is to provide an electric switch terminal board which will embody improvements in the terminal inserts so that the inserts upon being molded in the plastic board will be operatively held and locked in position.

Another object resides in providing terminal structure for an electric switch which will employ saddle-shaped pressure plates whereby the insertion of a wire to be connected is not only materially simplified but the physical gripping of the wire and also the electrical contact between the parts is greatly improved.

A still further object is to provide terminal structure for an electric switch characterized by a board of molded insulating material having channels for receiving the side skirts of the saddle-shaped pressure plates, and wherein said board is also provided with sloping aprons for certain of the terminal structures whereby to facilitate wire insertion.

With these and other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended thereto.

In the drawings which illustrate an embodiment of the invention and wherein like reference characters are used to designate like parts—

Figure 1 is a top plan view showing the terminal board of an electric switch and which embodies terminal structure coming within the invention;

Figure 2 is a longitudinal sectional view taken substantially along line 2—2 of Figure 1;

Figure 3 is a transverse sectional view taken centrally

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through the front terminal structures substantially along line 3—3 of Figure 1;

Figure 4 is a sectional view taken centrally through the rear terminal structures substantially along line 4—4 of Figure 1; and

Figure 5 is an elevational view showing in separated relation the several elements going to make up one of the terminal structures of the invention.

Referring to the drawings, the improved terminal board 10 for an electric switch, such as the fluid pressure actuated switch of Patent No. 2,790, 870, is formed of insulating material and the board has a central bore 11 extending into the top wall 12, the said bore communicating with the central opening 13 in the top wall. The wall 14 is located at the rear end of the terminal board, being integral therewith, and also integral with the intermediate or terminal supporting wall 15. A transverse wall 16 is located adjacent the front end of the board and the same projects upwardly a short distance above wall 15. The said transverse wall 16 and the terminal supporting wall 15 are further characterized by a pair of forwardly extending walls 17 and 18. Side wall portions, such as 20 and 21, complete the body portion of the terminal board and it will be noted that said last mentioned portions are likewise integral with the several walls of the board so that the terminal board, sometimes called a terminal block, consists of a unitary member molded of insulating material and which is equipped with several wire connecting devices embodying the improvements of the invention.

Figure 1 illustrates a preferred manner of locating four wire connecting devices on the terminal board 10 and wherein each of said devices, as best shown in Figure 5, will include a terminal insert rivet 24, a saddle-shaped pressure plate 25, and a holding screw 26. The terminal insert for each of the wire connecting devices is provided with a head 27 and a cylindrical body portion 28 which is threaded internally at 29 and knurled externally at 30. Each pressure plate is formed with depending side skirts 31 and with a front upwardly directed flange 32. The top wall 33 of the pressure plates is provided with a projecting rib 34 which extends transversely thereof and which forms a holding and gripping element on the underside of the plate for contact with the wire to be electrically connected to the terminal structure. The holding screw 26 is conventional in structure and consists of a slotted head 36 having an exteriorly threaded shank 37. The terminal inserts are molded in place in the terminal supporting wall 15 of the board and the knurling 30 on the cylinder body portion of each insert is spirally or angularly disposed so as to improve the holding and locking of the inserts in the molded plastic. The front flange 32 and the side skirts 31 of the pressure plates facilitate the insertion of the wire to be connected to the terminal, and upon screwing in of the holding screw 26 the said wire is gripped and securely held by the projecting rib 34. This gripping action of the projecting rib results from the bite which the projecting rib has with the wire to be connected to the terminal. Accordingly, an additional advantage of the projecting rib is that they materially improve the electrical contact between the wire and the pressure plate.

Referring to Figures 1, 3 and 4, it will be understood that a pair of wire connecting devices is located forwardly of the transverse wall 16 and a second pair of said devices is located forwardly of the rear wall 14. In order to distinguish between the front and rear terminal structure the inserts for the rear structure, which are connected to the power line, will be identified by numeral 40, the pressure plates by numeral 41, and the holding screws by numeral 42. For the front terminal structures, which are connected to the motor, numeral 44 identifies

the inserts, 45 the pressure plates, and 46 the holding screws. In Figure 1 it will be noted that one pressure plate and a holding screw therefor of each pair of terminal structures has been removed to better illustrate the insert head and the details of the recesses formed in the top surface of the wall 15 of the terminal board. This structure will now be described.

The top surface of the terminal supporting wall 15 is formed with a recess for each of the terminal structures, the recesses for the rear structures being identified by 50 and 51 and the recess for the front structure by numerals 52 and 53. Each recess is substantially rectangular in outline and whereas the rear recesses have wall 14, defining their rear limit, the front recesses are similar by reason of the transverse wall 16.

The rear recesses are additionally characterized by the spaced side walls 54, the inside wall being formed by the portion 55, and in accordance with the invention the entrance to each rear recess consists of a sloping apron 56 and a pad 57, the latter element having a height equal to that of the terminal insert and said pad also has contact with the head of the insert for a portion of its periphery. In fact, the sloping apron and pad are produced by the molding operation, at which time the inserts are molded in place, and it will be observed that the head of a terminal insert is located approximately centrally within each recess. One of the side walls 58 for each of the front recesses is formed by one of the vertically extending walls, either 17 or 18, and also the head of each terminal insert is associated with a pad 59. Since the head of a terminal insert has location in each of the recesses, the said head in conjunction with the pad forms a three-sided channel, two sides of which accommodate the side skirts of a pressure plate when the same is operatively associated with the terminal insert.

For making a connection to the old type of terminal it was necessary to clean and loop the wire, and upon complete removal of the terminal screw and insertion of the same through the loop, the parts could then be reassembled. In order to make a connection to one of the terminal structures, as herein disclosed and described, it is only necessary to clean the end of the wire and insert the same under a saddle-shaped pressure plate which has been previously loosened for the purpose of receiving the wire. Upon retightening the holding screw the connection is completed. Insertion of the wire under the pressure plate is facilitated by the pads and the operation of inserting the wire is additionally facilitated by the sloping aprons 56 which lead to the rear recesses. The pressure plates materially facilitate the operation of electrically connecting the wire to the terminal structure since by reason of the plates the connection to the wire is practically automatic. The depending side skirts of each pressure plate function to restrict the inserted end of the wire so that it is readily associated with and placed in contact with the head of a terminal insert. The depending side skirts are able to restrict and confine the inserted end of the wire since they depend from opposite sides of the plate and have location on respective sides of an insert head. The side channels accommodate the spaced skirts of a pressure plate so as to uniquely associate the plate with the head of a terminal insert and in a manner to simplify the terminal structure and the operation of connecting a wire while improving the physical and electrical connection effected by the parts.

The invention is not to be limited to or by details of

construction of the particular embodiment thereof illustrated in the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In a device of the character described, a member of insulating material having an approximately rectangular recess in the top surface thereof, a terminal insert molded in the member and having a head portion located within the recess centrally thereof, the height of the head portion being less than the depth of the recess and said terminal insert having a threaded bore extending from the head portion for the major length of the insert, a pressure plate substantially saddle-shaped in transverse section to provide depending side skirts for location in the recess, said depending side skirts being spaced from each other a greater distance than the diameter of the head portion of the insert but less than the width of the recess, a holding screw adapted to pass through an opening in the top wall of the pressure plate for threaded relation with the threaded bore of the terminal insert to secure the pressure plate to the head portion, and said member having a pad formed at the entrance end of the recess providing a top surface aligned with that of the head portion and having contact with the head portion, said pad having a width which does not exceed the diameter of the head portion of the terminal insert.

2. In a device of the character described, a terminal board of insulating material having an approximately rectangular recess in the top surface thereof, terminal structure located in the recess and including a terminal insert having a cylindrical body portion molded in the board and having an enlarged head positioned centrally of the recess, whereby channels are formed on at least two sides of the recess, a pressure plate for location in alignment over the enlarged head, said pressure plate having side skirts adapted to occupy the channels when the plate is operatively associated with the head, a holding screw extending through an opening in the top wall of the pressure plate and adapted to have threaded relation with the enlarged head of the insert, whereby to secure the pressure plate to said insert, and said terminal board having a sloping apron and a pad formed in its top surface in associated relation with the entrance end of the recess so as to facilitate the insertion of a wire to be connected to the terminal structure, said pad having a width which does not exceed the diameter of the head portion of the terminal insert.

3. A device of the character as defined by claim 2, wherein the sloping apron slopes towards the head of the terminal insert and terminates in said pad, and wherein the pad has contact with the head and provides a top surface in alignment with that of the head.

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