Sept. 28, 1948. J. A. PERHAM 2,450,380

SWITCH HANDLE FOR PORTABLE ELECTRIC TOOLS

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FIG. 1.

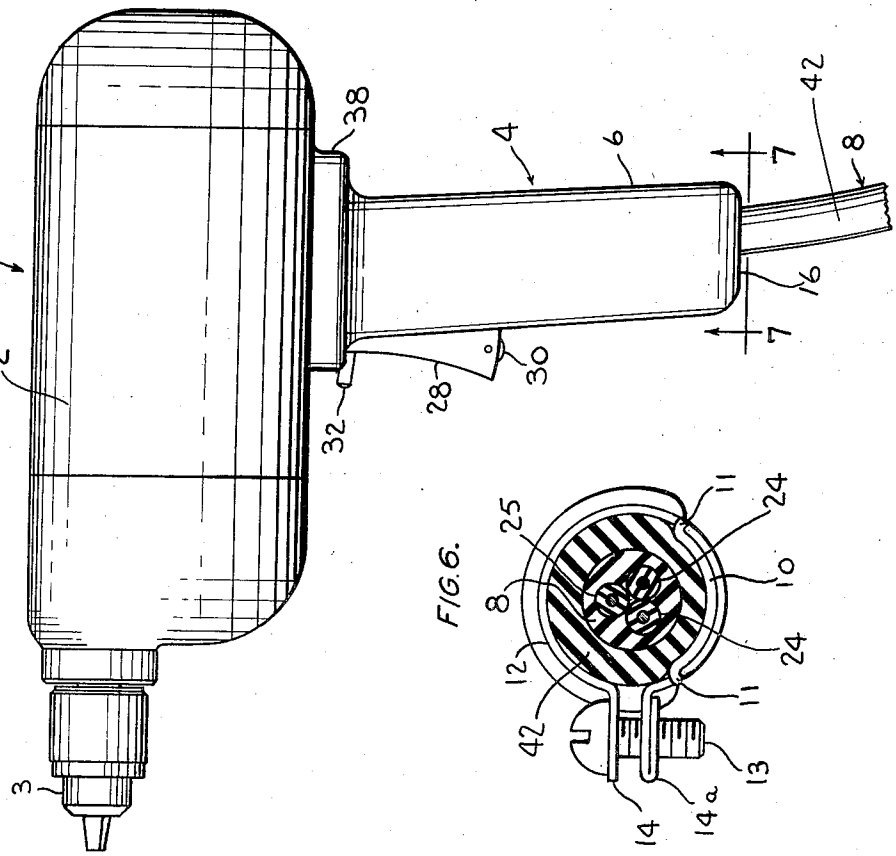


FIG. 6.

FIG. 7.

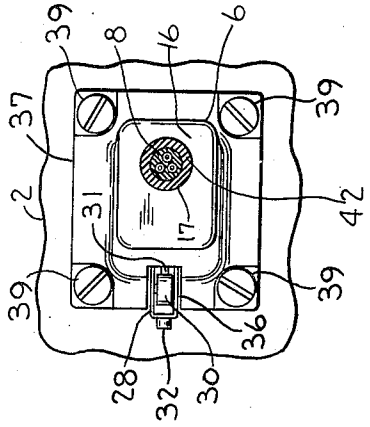
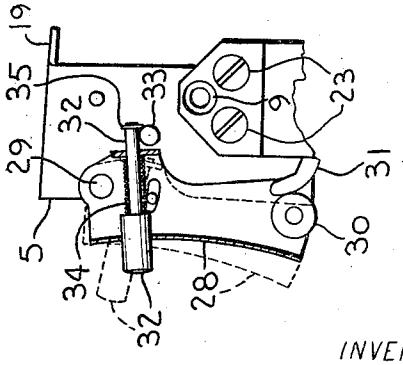


FIG. 5.



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SWITCH HANDLE FOR PORTABLE ELECTRIC TOOLS

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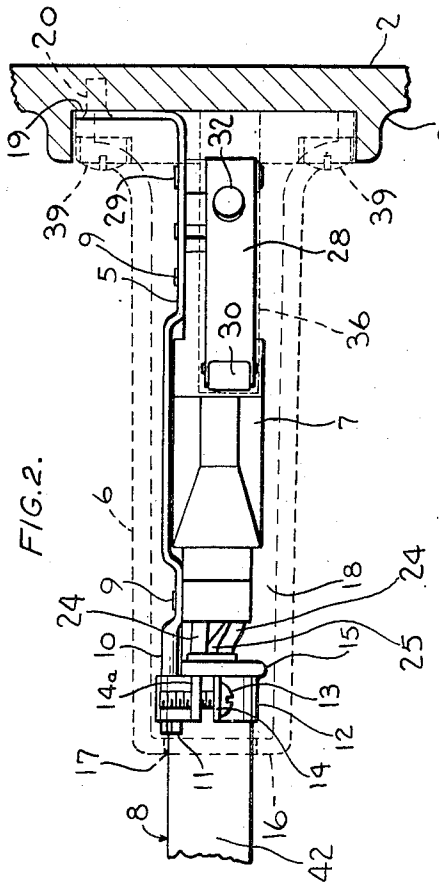


FIG. 2.

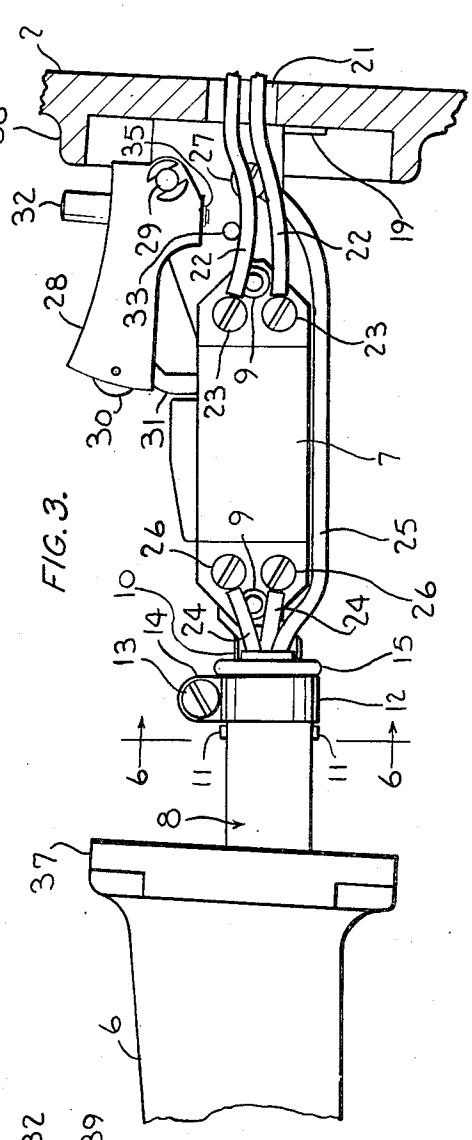


FIG. 3.

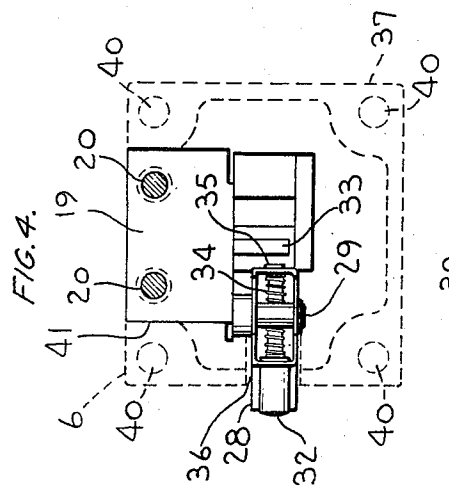


FIG. 4.

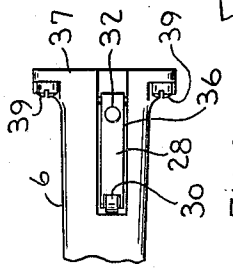


FIG. 8.

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2,450,380

SWITCH HANDLE FOR PORTABLE ELECTRIC TOOLS

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Application March 27, 1947, Serial No. 737,701

9 Claims. (Cl. 172—36)

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This invention relates to improvements in switch handles for portable electrically actuated drills and kindred tools.

The principal object and purpose of my invention is to provide a switch handle which consists of telescopically fitting bracket and outer handle parts, the latter part fitting over and protecting the bracket part and adjacent portion of the supply cable and the switch unit, both of which are secured to and supported by the bracket part independently of the handle part, to facilitate and render easy of connection the various leads or wires of the cable and to the tool motor, respectively, without hindrance by the tool casing or the outer handle part which may be slid onto the cable to be out of the way during the assembling operation.

The further object of my invention is to provide the outer handle part which is the form of hollow one-piece casting with a longitudinal slot to pass the switch trigger of the switch unit on the bracket for accessibility for operation by the thumb of the operator's hand grasping the handle part to control the operation of the tool motor.

A further object is to extend the slot aforementioned through one end of the handle casting to permit sliding of the casting over the bracket and the switch trigger thereon in an assembling operation.

The invention consists further in the features of construction and combinations thereof shown and described in the annexed specification and claims.

In the accompanying drawings—

Fig. 1 is a side elevational view of a complete portable electrically actuated tool equipped with a switch handle assembly constructed in accordance with my invention;

Fig. 2 is a view showing the bracket part of the handle assembly secured to the tool case in operative position, the outer handle part being shown in dotted lines for the purpose of illustration;

Fig. 3 is a side elevational view of the parts shown in Fig. 2, the handle part being slid onto the supply cable to more clearly show the cable clamp securing the cable to the bracket;

Fig. 4 shows a detail of construction to be hereinafter described;

Fig. 5 is a side view of the trigger lock to show the action thereof in releasably holding the switch trigger in circuit closing position;

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 3;

Fig. 7 is an end view of the handle assembly to show the cable extending into the same; the view being a section taken on line 7—7 of Fig. 1; and

Fig. 8 is a fragmentary elevational view of the handle casting to show the slot therein for the switch trigger to be presently described.

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In the drawings, 1 indicates a portable electrically actuated tool of the drill type having an outer casing 2 mounting and housing the electric tool motor which drives the tool spindle (not shown) to which the drill chuck 3 is operatively connected as in tools of the character illustrated.

The tool 1 is equipped with a switch handle assembly 4 by which the tool is handled and operated and this handle assembly is constructed in accordance with my invention and comprises two telescopically fitting parts, an inner bracket part 5 and an outer handle part 6.

The handle part 6 is in the form of a one-piece, hollow, casting of aluminum or other desired relatively light material and fits about and protects the bracket part 5 which supports the switch unit 7 and the clamp for the supply cable 8 for the tool motor. The switch unit 7 is secured to one side of the bracket 5 by rivets 9, 9 at the opposite ends of the unit 7 as shown in Figs. 2 and 3.

The bracket 5 is made of rigid material in strap form, preferably of sheet steel, and supports the switch unit 7 and the cable 8 independently of the handle part 6. In this respect, the bracket 5 has an outer end extension 10 off-set slightly from the body portion of the bracket and having shoulders 11, 11 at or adjacent its outer end to provide stops against which fit a band 12 for clamping the cable 8 to the bracket.

The band 12 is annular-like in form and of resilient sheet metal to be tightened about the cable 8 and the bracket extension 10 by a clamp screw 13 which extends through the spaced ends 14, 14a at the divided ends of the band, the screw 13 being tapped into the band end 14a. Hence, the cable 8 may be tightened and loosened with respect to the bracket 5 on turning the screw 13 in opposite directions. The band 12 fits about the cable 8 between the stops 11 and the beaded end 15 of the cable as shown herein, the bracket extension 10 conforming to the curvature of the band and the cable as shown in Fig. 6.

The end wall 16 of the handle casting 6 closes its outer end, except for an opening 17 therein for the passage of the cable 8 into the handle casting 6 for connection with the bracket 5 by the clamp 12. Hence, the live and ground leads of the cable 8, to be later indicated, may be con-

nected to the desired terminals on the switch unit 7 and the bracket 5, respectively.

The bracket 5 is approximately as long as the cored out cavity or chamber 18 (Fig. 2) within the handle part 6 and is provided at its inner end with a right-angular, integral flange 19 through which machine screws 20, 20 pass to secure the bracket 5 to the tool case 2 adjacent its opening 21 therein for the passage of the live leads 22, 22 from the switch unit 7 to the tool motor to connect the latter in the electric circuit. The wires 22 are connected to the switch terminals 23, 23 as shown in Fig. 3.

The live and the ground wires of the cable 8 are marked 24, 25, respectively, and are connected to the switch terminals 26, 26 and to the bracket terminal 27, respectively, as detailed in Fig. 3.

The trigger or actuator 28 of the switch unit is pivotally mounted on one side of the bracket 5 adjacent to the unit 7, the pivot pin being marked 29 herein. The trigger 28 extends along the bracket 5 over the unit 7 and carries a roller 30 at its rear or free end to co-act with the upper inclined end of the switch lever 31 as detailed in Fig. 5. Hence, pressing inwardly on the trigger 28 actuates the lever 31 to close the contacts of the switch unit 7 to complete the circuit to the tool motor for operating it.

To keep the tool motor in operation without manually holding the trigger 28 depressed, I provide a releasable locking plunger 32 slidably mounted on the trigger 28 inwardly of the pivot pin 29 as shown in Fig. 5. The locking plunger 32 is normally spring biased outwardly as shown in Fig. 5 to project it out of the path of a stop pin 33 rigidly fixed to the bracket 5 when the plunger is released to the action of its spring 34 as indicated by the broken lines in Fig. 5. Depressing the trigger 28 while the latter is held in its depressed position by the interconnection of the plunger 32 with the stop 33 as shown in full lines in Fig. 5, carries the enlargement 35 on the inner end of the plunger 32 away from the stop 33 and frees the plunger 32 for raising by its spring 34 out of the path of the stop 33. At this time trigger 28 is forced outwardly by the spring action of the switch unit 7 on its actuating lever 31 and the switch contacts are broken to break the current to the tool motor.

The handle part 6 is provided in its top wall with a longitudinal slot 36 to receive the trigger 28, the slot opening through the adjacent end of the casting 6 to enable the casting 6 to be slid on and off the bracket 5 in assembling and disassembling the parts with respect to the bracket.

The tool case 2 is provided about its opening 21 with a surrounding boss 38 to provide a recess to the seat handle end 37 when securing the handle assembly in place.

To accomplish the latter purpose, the bracket 5 with the switch unit 7 fixed thereto has the cable 8 clamped to the bracket and the latter is secured to the tool case 2 by the screws 20 through the flange 19. The several wires are then connected to the switch and the bracket terminals, this being easy to accomplish, the handle part 6 being slid onto the cable 8 and out of the way. The terminals referred to are located exterior of the tool case 2 and are easy of access in connecting the wires. After the foregoing connections are made the handle part 6 is moved from the cable into enclosing relation with the bracket 5 with trigger 28 in the slot 36, whereupon, the handle part 6 is secured to the tool case 2 by machine screws 39 and the handle is completely assembled on the tool.

The screws 39 are inserted through holes 40 at the four corners of the inner end 37 of the handle casting 6 and the inner end 37 of the latter has a recess 41 to receive the flange 19 to countersink the same. The heads on the screws 20 are also countersunk in the flange 19 to provide a snug fit of the assembly.

Or the switch handle may be assembled in the following manner: The bracket 5 is first secured to the field case 2 by the screws 20 at the flange 19. The leads 22 are brought from the motor through the opening 21 and connected to the two top switch terminals 23. The cable 8 is inserted into the outer handle member 6 through the end opening 17, the handle member 6 being slid down on the cable and out of the way. The rubber sleeve 42 is then placed over the end of the cable 8 and the two are placed in position on the bracket 5. The cable clamp 12 is placed around the rubber sleeve 42 and the bracket 5 and is clamped securely with the screw 13. The two leads 24 from the cable are connected to the lower switch terminals 26 and the ground lead 25 is connected with the bracket terminal 27. In this position of the parts the switch unit 7 can be inspected and tested and the screws 39 put in place to secure the handle assembly to the field case 2.

From what has been described herein, the advantages of the invention are believed to be apparent. The ease of assembly is a very important advantage. The leads or wires are placed in a definite position and consequently do not bind inadvertently between other parts during assembly. This definite location of the wires adds to the safety of the tool preventing the grounding of live parts. This feature also provides for easy inspection because the leads are in the exact position they were placed within the handle. Another advantage is that a cable clamp which is easily manufactured can securely clamp the cable to the bracket.

The details of construction and arrangement of parts shown and described may be variously changed and modified without changing and departing from the scope of my invention, except as pointed out in the annexed claims.

I claim as my invention:

1. A handle assembly of the character described for portable electrically actuated tools comprising, telescopically fitting parts, an inner part in the form of a bracket member and an outer part in the form of an outer handle member, a switch unit and an actuator therefor and a cable clamp mounted on and supported by said bracket, said switch unit having terminals on the outer side thereof, an electric supply cable secured to said bracket by said clamp, said cable having leads connectible to certain of said terminals, said outer handle member being hollow to enclose the bracket and the switch unit and the cable clamp thereon and having an opening to receive the actuator when the handle members are assembled, and means whereby said handle members may be secured to a tool case.

2. A handle assembly of the character described for portable electrically actuated tools comprising, telescopically fitting parts, an inner part in the form of a bracket member and an outer part in the form of an outer handle member, a switch unit and an actuator therefor and a cable clamp mounted on and supported by said bracket, said switch unit having terminals on the outer side thereof, an electric supply cable se-

cured to said bracket by said clamp, said cable having leads connectible to certain of said terminals, said outer handle member being hollow and in one-piece form with open opposite ends to pass the bracket and the cable, respectively, said outer handle member having a longitudinal slot at one end of the handle member to receive the actuator on assembling the handle members, and means at the slotted end of the outer handle member whereby the handle members may be secured to a tool casing.

3. The combination as defined in claim 2 characterized by the fact that the means for securing the handle members to the tool case secure the outer handle member to the tool case independently of the bracket member.

4. The combination as described in claim 2 characterized by the fact that the bracket member is in the form of relatively flat, self supporting stock, and that the switch unit and the cable clamp are secured to opposite ends thereof.

5. The combination as defined in claim 2 characterized by the fact that the switch unit is secured to the bracket member between the ends thereof while the clamp member is mounted on the bracket adjacent its outer end.

6. The combination as defined in claim 2 characterized by the fact that the bracket member is provided with a laterally extending flange for securing the bracket in place on the tool case.

7. The combination as defined in claim 2 characterized by the fact that the bracket member has an angularly extending flange at one end to secure the bracket member to a tool case and the outer handle member has a recess to receive said flange therein.

8. The combination with a portable electrically actuated tool having an outer casing and electric tool motor therein, of a handle assembly for the tool comprising two telescopically fitting parts, an inner bracket part and an outer handle part, both secured to and extending outwardly from the tool case, a switch unit and an actuator therefor mounted on and supported by the bracket with the conductor connecting terminals of the switch unit exterior of the tool case, an electric supply cable for the tool motor secured to and supported by the bracket, the cable having leads connectible with certain of the terminals of the switch unit and other leads connecting the motor with the other terminals of the switch unit to include the cable and the switch unit in the circuit for the motor, said outer handle part fitting slidably over the bracket and enclosing the bracket and the terminals thereon, and means for securing the outer handle part to the tool case independently of the bracket whereby the outer handle part may be positioned outwardly of the bracket to render the switch terminals accessible for connecting the leads thereto without hindrance by the tool casing or the outer handle part in assembling the handle assembly on the tool.

9. The combination with a portable electrically actuated tool having an outer casing and an electric tool motor therein, of a handle assembly for the tool comprising two telescopically fitting parts, an inner bracket part and an outer handle part, both secured to and extending outwardly from the tool case, a switch unit and an actuator therefor mounted on and supported by the bracket with the conductor connecting terminals thereof spaced outwardly from the tool case, an electric supply cable for the tool motor, a cable clamp carried by the bracket for securing the cable thereto, the cable having leads connectible with certain of the terminals of the switch unit, other leads connecting the motor with the other terminals of the switch unit to include the cable and the switch unit with the motor circuit, said bracket part having an angular flange portion at its inner end for contact with the tool case, said outer handle part having an inner end portion to be seated on the tool case over said flange portion, and means for securing the bracket part to the tool case through said flange, and means for securing the outer handle part to the tool independently of the bracket whereby the outer handle part may be slid outwardly of the bracket onto said cable to render the cable clamp and the terminals accessible without hindrance by the tool case or the outer handle part in securing the leads to the terminals or the cable to the bracket.

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No references cited.