F. C. DE REAMER.

ELECTRIC SWITCH.

APPLICATION FILED DEC. 11, 1916.

1,266,424. Patented May 14, 1918.

Fig. 1.

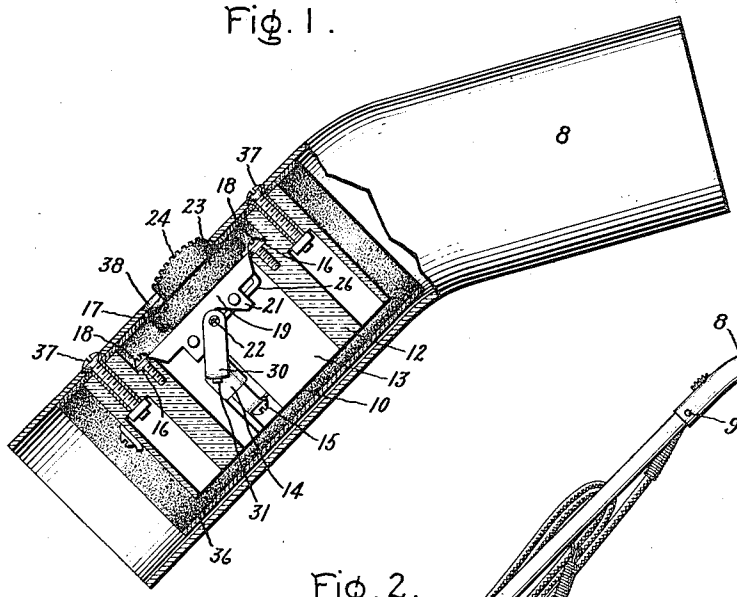


Fig. 2.

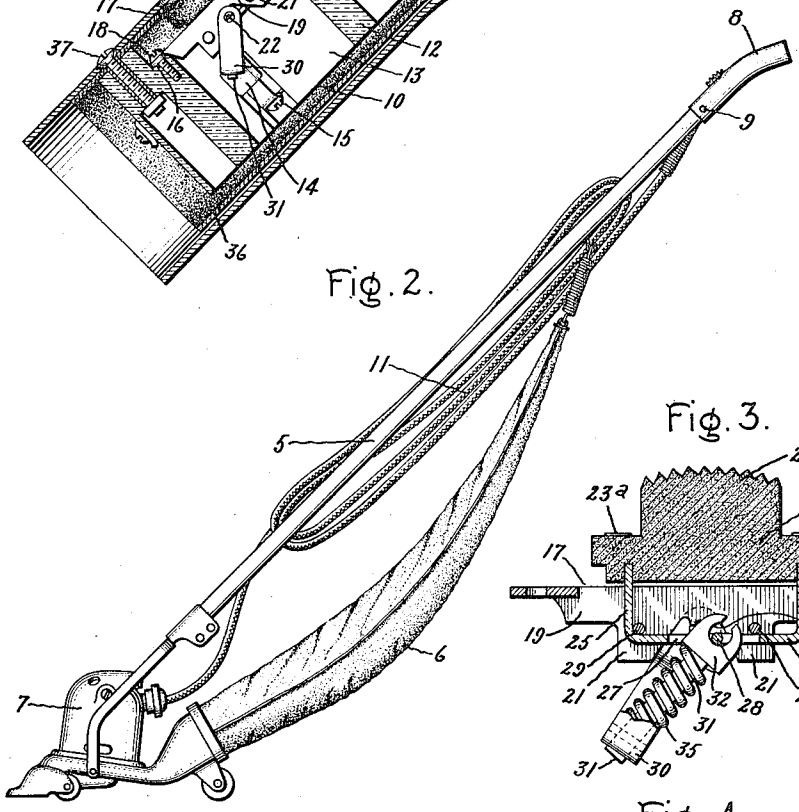


Fig. 3.

Fig. 4.

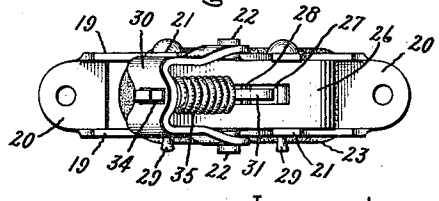
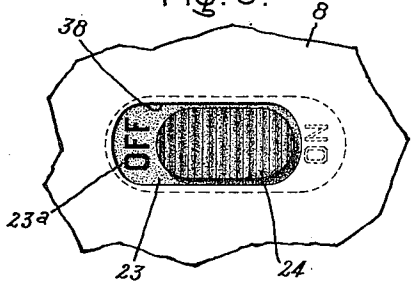


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

1,266,424. Specification of Letters Patent. Patented May 14, 1918.

Application filed December 11, 1916. Serial No. 136,195.

To all whom it may concern:

Be it known that I, FRANK C. DE REAMER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

The present invention relates to electric switches and has for its object to provide an improved switch which is especially well adapted to the handle of a vacuum cleaner or other similar apparatus. In the following specification the invention is particularly described as applied to a vacuum cleaner, but it will be understood that it is not necessarily limited thereto.

For a consideration of what I believe to be novel and my invention attention is directed to the accompanying specification and the claims appended thereto.

In the accompanying drawing, Figure 1 shows a portion of the handle of a vacuum cleaner with a switch therein, the switch and a part of the handle being in section; Fig. 2 is a side elevation of a complete cleaner illustrating the location of the switch, Figs. 3 and 4 are detail views of the switch, Fig. 3 being a vertical sectional view and Fig. 4 a bottom plan view, and Fig. 5 is a plan view of the switch button.

Referring to the drawing, 5 indicates the handle, 6 the dust bag, and 7 the electric motor of a vacuum cleaner which, as to its detail structure, may be of any suitable design. Mounted on the outer end of the handle is a curved tube 8 which forms the grip for the operator's hand. The tube 8 telescopes over the end of the handle for a short distance and is suitably pinned to it, as indicated at 9. Located within the tube 8 is an electric snap switch 10 which is connected to the motor 7 by the cord 11.

Referring now particularly to Figs. 1, 3 and 4, the switch comprises a cylindrical base 12 of insulating material, as a suitable molded compound, provided with a longitudinally extending slot 13 within one end of which are arranged the two contact plates 14, one on each side. Owing to the character of the views only one contact plate shows in the drawing, but the arrangement of the other one opposite to it will be readily understood. They are held in place by screws 15. At the ends of the slot 13 are shoulders 16 which support a longitudinally extending rectangular switch frame 17 held by screws 18. The switch frame 17 comprises two side plates 19 joined at the ends by cross-plates 20. At the central portion of each side plate is a pair of spaced projecting stop lugs 21 between which and extending outwardly at right angles thereto is a short trunnion 22. Slidably mounted on the frame 17 is a push bar 23 having a knurled button 24. The push bar 23 is sufficiently wide to rest on the top of the side plates 19 and fastened to its lower surface are two up-turned ends 25 of a metal plate 26 located between the side plates 19 of the switch frame. The plate 26 has a central slot 27 across which extends a web or pin 28. The push bar 23 and plate 26 are held in position on the switch frame 17 by two cross pins 29 in the frame 17, which pins also serve to limit the longitudinal movement of the push bar and plate 26. They form, furthermore, a practically frictionless bearing for the push bar 23 and plate 26. Pivoted on the trunnions 22 is a U-shaped switch blade 30, the lower end of which in one position engages the contact plates 14. The two legs of the U-shaped switch blade 30 are curved inwardly so that they engage the stop lugs 21 which serve to limit its swinging movement. Located between the two legs of the switch blade 30 is a spindle 31 having at one end a head 32 provided with a slot 33 in which the cross web or pin 28 fits. The other end of the spindle passes loosely through an opening 34 in the bottom of the U-shaped switch blade 30. Surrounding the spindle 31 is a spring 35, one end of which engages the head 32 and the other the bottom of the U-shaped switch blade 30. Surrounding the cylindrical switch base 12 is a fiber sleeve 36 which is of somewhat greater diameter than the base as shown in Fig. 1. The sleeve 36 and base 12 are fastened within the tube 8 by holding screws 37, the knurled button 24 of the push bar 23 projecting through a slot 38 in the tube 8. As will be seen from Fig. 1 the slot 38 is of lesser area than the surface of the push bar 23. The push bar 23 thus serves to close this opening to prevent dust from getting into the switch. By putting suitable indicia on the push bar as indicated at 23^a, the switch can be made to indicate the "on" and "off" positions.

In the position of the parts as shown in

Fig. 1, the switch is closed, the switch blade 30 being between contacts 14. The web or pin 28 lies to the right of trunnion 22 and spring 35 which is under compression holds the left-hand end 25 of plate 26 against pin 29, and the switch blade 30 against the left-hand lugs 21. To open the switch the push bar is pushed toward the left. This moves the plate 26 and the upper end of spindle 31, the lower end of which slides through opening 34, the spring 35 thus being put under further compression. The plate 26 is held against the pins 29 by the spring 35 and slides on them with an almost frictionless contact as already referred to. As soon as the web or pin 28 passes the trunnion 22 then the spring 35 acts to quickly snap the switch blade to open position where it rests against the right-hand stop lugs 21. To close the switch again the push bar is moved toward the right, the switch blade 30 snapping over to a position between the contacts 14 as soon as the web or pin 28 passes the dead center as already explained. It will thus be seen that the switch is operated by a reciprocating motion of the push button in a direction longitudinally of the cleaner handle. This is a very advantageous arrangement as it enables the operator while holding the handle to operate the switch with his thumb, and this may be done very quickly and without any inconvenience or preliminary movements, and without removing the hand from the handle.

The arrangement also has the advantage that it permits of a very simple design of switch being used and one which is easy to assemble and install. In assembling, the U-shaped plate is dropped down through the opening in the top of the frame 17 and the two pins 29 are inserted. This makes a very cheap assembly construction which is of great importance in a switch of this character. In installing the assembled switch in the cleaner handle, the switch, being made smaller in diameter than the tube 8, can be slipped into it and then drawn up tight against the top of the tube by the screws 37. This brings the button 24 up through slot 38, the surface of the push bar serving to close the slot.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by any other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. The combination with a casing having a slot in its wall, of a switch located therein comprising a frame, a push bar having an operating button which projects through said slot, and a depending plate which drops down between the sides of the frame, pins in the frame which hold the plate in position and upon which it slides, and a switch blade which is moved by the push bar and plate.

2. In a switch, the combination of a base, a frame supported thereon, a push bar having an operating button which slides longitudinally of the frame, a depending U-shaped plate which is fixed to the push bar and drops down alongside the frame, pins in the frame which hold the U-shaped plate and the push bar in position and serve as bearings upon which the plate moves, a switch blade which is moved by the push bar and plate, and coöperating contacts carried by said base.

3. The combination with a handle provided with a tubular end and a slot in the end, of a switch located within the tubular end and provided with an operating button which projects through the slot, said switch comprising a frame, a push bar which carries said button and has a U-shaped plate fixed to it which drops down between the sides of the frame, pins in the frame which hold the U-shaped plate in position and serve as bearings upon which it slides, and a switch blade which is moved by the push bar and plate.

In witness whereof, I have hereunto set my hand this 9th day of December, 1916.

FRANK C. DE REAMER.