

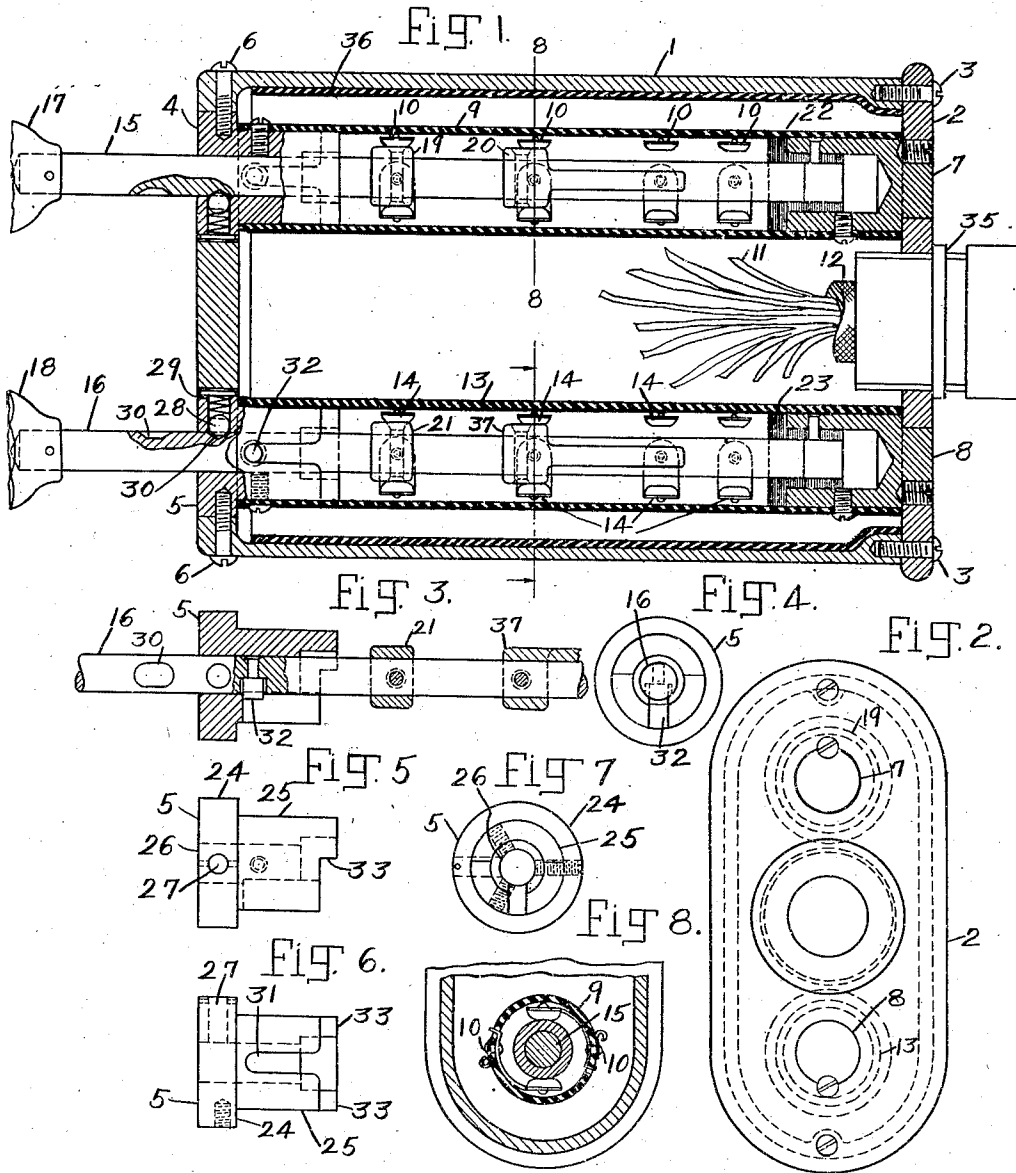
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1,640,755

R. C. DEALE

ELECTRIC SWITCH

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INVENTOR.
R. C. Deale.
BY *Wayne B Wells*
ATTORNEY

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UNITED STATES PATENT OFFICE.

ROBERT C. DEALE, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO NILES-BEMENT-POND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ELECTRIC SWITCH.

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My invention relates to electric switches and particularly to manually operated portable switches.

One object of my invention is to provide a switch having a plurality of manually operated contact rods that shall have the contact members thereof connected to a cable which also serves as a support for the switch structure.

Another object of my invention is to provide a switch of the above indicated character that shall have two contact elements each adapted to effect a limited longitudinal movement and to effect a limited rotative movement in only one extreme longitudinal position thereof.

A further object of my invention is to provide a portable switch of the above indicated character that shall control the circuits of the main and the feed motor of a planer or of a similar machine tool in an efficient manner.

In operating many machine tools, as for example a planer, it is desirable not only to control the operation of the main motor at will, under certain conditions, but also to control the operation of the feed motor at will under certain conditions. In a planer, the main motor, which controls the operation of the reciprocating table, is automatically controlled by means of a pilot switch which is operated by dogs mounted on the table. The pilot switch not only serves to control the operation of the main motor but also in many cases automatically controls the operation of the feed motor. In some cases, a switch of the portable type is provided for controlling the operation of the main motor at will. However, no switch has been provided heretofore which would also control the operation of the feed motor at will. In some cases, a stationary switch has been mounted on the side of the planer for effecting certain operations of the feed motor.

By means of a switch constructed in accordance with my invention not only the main motor but also the feed motor of a planer may be manually controlled in an efficient manner. The switch comprises a suitable casing in which are mounted tubes of insulating material which carry contact fingers. The contact fingers are connected in suitable arrangement to a cable which also serves as a support for the complete switch structure. Two contact rods, which project

into the tubes, carry contact segments which are adapted to engage the contact fingers in various combinations. Each of the contact rods is supported in a plug member and has a pin and slot connection to said plug member. The pin and slot connections serve to control and limit the movements of the contact rods in the casing. In the structure shown in the drawing, each rod has a limited longitudinal movement and is permitted to effect a limited rotative movement in one extreme position. The contact fingers may be connected in any suitable arrangement to each other and to the wires of the cable.

In the accompanying drawing:

Figure 1 is a sectional view of a switch constructed in accordance with my invention.

Fig. 2 is an end view of the switch shown in Fig. 1.

Fig. 3 is a detail view of one of the lower plugs and the contact rod connected thereto.

Fig. 4 is an end view of the rod and plug shown in Fig. 3.

Fig. 5 is a detail view of a lower plug member.

Fig. 6 is a side view of the plug member shown in Fig. 5.

Fig. 7 is an end view of the plug member shown in Fig. 5.

Fig. 8 is a section along the line 8—8 of the switch shown in Fig. 1.

Referring to the drawing, a switch is shown comprising a casing 1 having a cover 2 attached thereto by suitable screws 3. The lower portion of the casing 1 has two openings in which are inserted two lower plug members 4 and 5. The two lower plug members 4 and 5 are secured in position in the casing by means of screws 6. Two upper plug members 7 and 8 are secured to the cover 2 in any suitable manner. A tube 9, which is composed of insulating material, is secured to the lower plug 4 and the upper plug 7 in any suitable manner. The tube 9 carries a plurality of contact fingers which are suitably connected together and to the conductors 11 of a cable 12. The cable 12, which is connected to the contact fingers mounted on the tube 9, also serves as a means for supporting the switch structure.

Primarily the invention is designed for use as a pendent switch, as shown in Fig. 1 of the patent to Deale 1,579,651 granted April 6, 1926. The cable 12 is extended be-

yond the connector 35 and its opposite end attached to the arch of the planer.

A tube 13, which is similar to the tube 9 and which is composed of insulating material, is secured to the lower plug 5 and the upper plug 8. The tube 13 carries a plurality of contact fingers 14 which are similar in structure to the contact fingers 10 which are mounted on the tube 9. The contact fingers 14 are suitably connected to the contact fingers 10 and to the conductors 11 of the cable 12.

Two contact rods 15 and 16 project through the lower plug members 4 and 5 into the tubes 9 and 13 in the casing 1. The contact rods 15 and 16 are provided with operating knobs 17 and 18 and carry contact segments 19, 20, 21 and 37. An insulating bushing 22, which is mounted in the upper plug member 7, serves as a bearing for one end of the contact rod 15. Another insulating bushing 23, which is suitably mounted in the upper plug member 8, serves as a bearing for one end of the contact rod 16. The plug members 4 and 5 not only serve as bearings for the rods 15 and 16 but also serve to guide the movements of the rods in a manner to be hereinafter set forth.

The lower plug member 5 comprises a head portion 24, which is secured to the casing 1, and a portion 25 which projects into the casing. An opening 26 is formed through the head portion 24 and the projecting portion 25 for receiving the contact rod 16. An opening 27 is formed in the head portion 24 for receiving a ball 28 and a spring member 29. The spring member 29 is disposed between the bottom of the casing 1 and the ball for forcing such ball member into grooves 30 formed in the contact rod 16. The spring member 29 and the ball 28 cooperate with the grooves 30 to accentuate the various positions of the contact rod 16. A longitudinal slot 31 is formed in the portion 25 of the plug member for receiving a pin 32 which is suitably secured to the contact rod 16. The pin 32 in rod 16 not only limits the movement of the rod towards the left, as shown in Fig. 1 of the drawing, but also prevents any rotative movement of the rod 16 when the pin is in such position. When the rod 16 is in its extreme position toward the right, the rod may be rotated a limited extent to engage shoulders 33 which are formed on the plug member 5. In the lower position of the rod 16 or the position toward the left as shown in Fig. 1 of the drawing, the contact segments 21 and 37 each bridge two sets of contact fingers 14. In the opposite position of the contact rod 16, the

contact segments 21 and 37 are separated from the first two sets of contact fingers 14. A rotative movement of the rod 16 in either direction when in the raised position serves to bridge a set of contact fingers 14.

The lower plug member 4 is similar in construction to the lower plug member 5 and is provided with similar means for accentuating the position of the contact rod 15 and for guiding the movements of the contact rod 15. The contact segments 19 and 20 on the rod 15 are shown similar in construction to the contact segments 21 and 37 on the rod 16. However, it is to be understood that if so desired, the shape and arrangement of the contact segments on the rods may be varied at will. A suitable connector 35 is secured to the cover 2 of the casing 1. The cable 12 is projected through and connected to such connector 35. Preferably the inside of the casing 1 is lined with a suitable insulating fiber 36.

Modifications in the apparatus and in the arrangement and location of parts may be made within the spirit and scope of my invention and such modifications are intended to be covered by the appended claims.

What I claim is:

1. In a portable switch, the combination with a casing, a plurality of contact fingers located in said casing, and two plug members located in openings formed in said casing, of two contact rods projecting through said plug members into said casing, contact segments on said rods for engaging said contact fingers, and a pin on each of said rods projecting into a T-slot formed in the associated plug member, said slots permitting each rod to assume one position when lowered and to assume one of two positions when raised.

2. In a switch, the combination with a casing having two openings in the bottom thereof, a lower plug member located in each of said openings, a cover for said casing having a cable opening therein, upper plug members secured to said cover and aligned with the lower plug members, and tubes of insulating material carrying contact fingers and supported between the upper and the lower plug members, of two contact rods projecting through the lower plug members and having bearings in the upper plug members, contact segments on the rods for engaging the contact fingers on said tubes, and a pin and slot connection between the rods and the lower plug members for guiding the movements of the contact rods.

In testimony whereof, I hereto affix my signature.

ROBERT C. DEALE.