

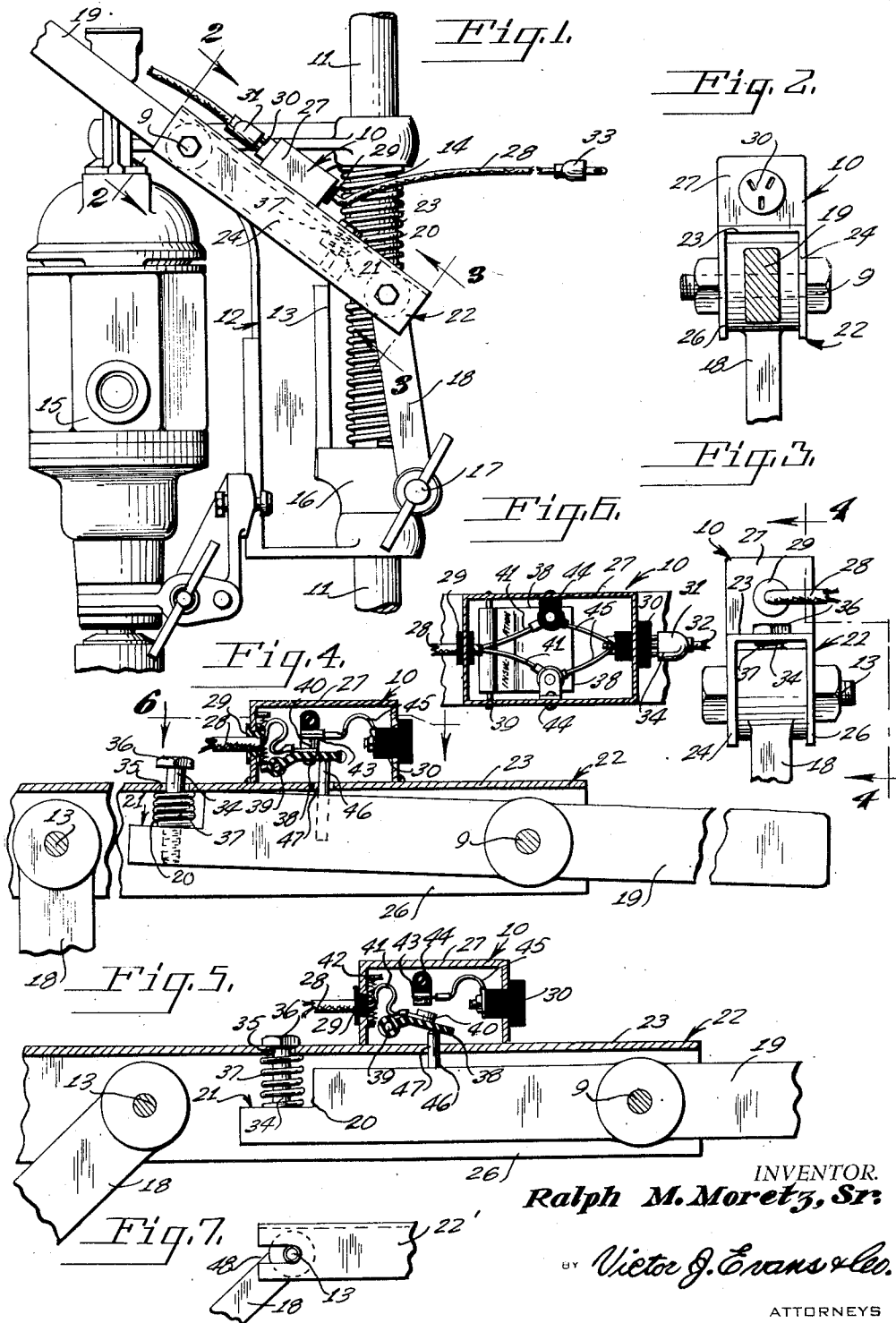
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AUTOMATIC SAFETY DRILL PRESS SWITCH

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AUTOMATIC SAFETY DRILL PRESS SWITCH

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4 Claims. (Cl. 200—61.58)

This invention relates to a tool, such as a drill press, and more particularly to a safety switch for a drill press.

The object of the invention is to provide a safety switch for a tool such as a drill press whereby the tool will be automatically electrically actuated when the tool is moved into engagement with a work piece, and wherein the tool will be deactivated automatically when manual pressure on the tool is released.

Another object of the invention is to provide a safety switch which is adapted to be mounted on a drill press stand so that when the handle is pulled down to place the drill bit in contact with the work piece, the drill bit motor will be automatically energized, and wherein when pressure is released on the handle, the drill bit motor will be automatically cut-off or stopped as a safety feature.

A further object of the invention is to provide a safety drill press switch which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same:

Figure 1 is a side elevational view showing a portion of a drill press, with the safety switch of the present invention mounted thereon.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a fragmentary side elevational view, with parts broken away and in section, and taken on the line 4—4 of Figure 3 and showing the circuit leading to the motor closed.

Figure 5 is a view similar to Figure 4 but showing the position of the parts with the switch open.

Figure 6 is a sectional view taken on the line 6—6 of Figure 4.

Figure 7 is a fragmentary elevational view showing a modification.

Referring in detail to the drawings, there is shown a drill stand which has the safety switch 10 mounted thereon. The drill stand may be any suitable type such as the drill stand shown and described in Patent No. 2,038,422, and manufactured by the Black and Decker Manufacturing Company. The drill stand includes a vertically disposed column 11 having a carriage 12 slidably mounted thereon, and a coil spring 14 is circumposed on the column 11 for normally urging the carriage 12 to its raised or uppermost position. The numeral 15 designates the motor for actuating the usual drill bit, and there is further provided a fulcrum block 16. A pivot pin or screw 17 pivotally connects the lower end of a link 18 to the fulcrum block 16.

The numeral 19 designates a handle or lever which is adapted to be manually gripped and moved downward when the motor 15 and drill bit are to be moved toward

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the work piece. The lever 19 is provided with a cutout 20 adjacent one end thereof, and the cutout 20 defines a shoulder 21 for a purpose to be later described.

There is further provided a U-shaped bracket or channel member 22 which includes a web 23 and spaced parallel side walls 24 and 26. The link 18 is pivotally connected to the bracket 22 by means of a suitable pivot pin or bolt and nut assembly 13, and the lever 19 is pivotally connected to the bracket 22 by means of a suitable pin or bolt and nut assembly 9.

Mounted on the top of the bracket 22 and secured thereto in any suitable manner is a switch housing 27 which can be made of any suitable material. The housing 27 has a switch mechanism arranged therein. A grommet 29 is arranged in an end of the housing 27, and an electric wire or cord 28 extends through the grommet 29 and the cord 28 may have a plug 33 on an end thereof whereby the cord 28 can be connected to an outlet or the like so that the drill can be connected to a suitable source of electrical energy. Also mounted in the housing 27 is a socket 30 which is adapted to be engaged by a male plug 31 that is connected to a cord 32. The cord 32 leads to the motor 15.

The end wall 23 is provided with a slot 35, and a stud 34 projects through the slot 35 and is secured to the shoulder 21 of the lever 19. A head 36 is arranged on the outer end of the stud 34, and a coil spring 37 is circumposed on the stud 34, Figures 4 and 5. The coil spring 37 serves to normally bias or urge the parts from the position shown in Figure 4 to the position shown in Figure 5.

Pivotally mounted in the housing 27 is a plate 38, and the plate 38 is pivotally mounted on a pivot pin or hinge pin 39. Secured to the plate 38 is a pair of spaced apart contacts 40, and wires 41 lead from the cord 28 to the contacts 40. A coil spring 42 has one end connected to the plate 38, while the other end of the coil spring 42 is connected to an end wall of the casing 27. The coil spring 42 serves to normally move the parts from the position shown in Figure 4 to the position shown in Figure 5 when pressure on the lever or handle 19 is released.

There is also mounted within the housing 27 a pair of stationary terminals or contacts 43, and the terminals 43 may be secured within the housing 27 by suitable securing elements 44. Wires 45 connect the terminals 43 to the socket 30. A pin 46 extends through a slot 47 in the end wall 23, and the pin 46 is interposed between the lever 19 and the plate 38, Figure 5. The pin 46 may be secured to the plate 38 so that when the lever 19 is moved from the position shown in Figure 5 to the position shown in Figure 4, the pin 46 will cause the plate 38 to be pivoted in a counterclockwise direction, Figure 4, whereby the contacts 40 will move into electrical engagement with the terminals 43. Then, when pressure on the lever 19 is released, the spring 42 will return the plate 38 to the position shown in Figure 5 so that the electrical circuit will be opened whereby the motor 15 will be stopped. At the same time the spring 37 will cause the lever 19 to move from the position shown in Figure 4 to the position shown in Figure 5.

Referring to Figure 7 of the drawings there is shown a modification wherein the channel member 22' is provided with slots 48 in its end for receiving the bolt and nut assembly 13 that is connected to the link 18. Thus, the channel member 22' having the slots 48 receives the bolt and nut assembly 13, and the channel member 22' is used in the same manner as the previously described channel member 22.

From the foregoing it is apparent that there has been provided a safety switch for use with a bench drill or

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the like. Although the safety switch is illustrated being used with a Black and Decker drill it is to be understood that the switch can be used with other tools. In use, the housing 27 is mounted on the bracket 22, and the bracket 22 is connected to the lever 19 through the medium of the pivot pin 9, and the bracket 22 is also pivotally connected to the link 18 through the medium of a pivot pin or bolt and nut assembly 13. Normally the parts are in the position shown in Figure 1, and when it is desired to drill a hole in a piece of work or material, it is only necessary to apply manual pressure to the lever 19 to swing the lever 19 downward in a counterclockwise direction. As the lever 19 is moved downwardly it will move from the position shown in Figure 5 to the position shown in Figure 4 whereby the pin 46 will cause the plate 38 to move upwardly so that the contacts 40 will engage the terminals 43 whereby the electrical circuit will be completed from the cord 28 through the switch 10 to the cord 32 and then to the motor 15. Thus, at the same time that the motor 15 and drill bit are being lowered into engagement with the work piece, the motor 15 will be automatically energized. When manual pressure is released on the lever 19, the coil spring 14 will return the carriage which carries the motor 15 to its raised position. Also, when pressure is released on the lever 19, the coil spring 37 will bias or urge the lever 19 from the position shown in Figure 4 back to the position shown in Figure 5 so that the coil spring 42 will be able to move the plate 38 away from the terminals 43. Thus, the electrical circuit to the motor 15 will be released as a safety measure whenever the operator releases pressure on the lever 19.

Although the safety switch has been illustrated on a Black and Decker drill, it is to be understood that it can be used on other tools such as the tool manufactured by the Independent Pneumatic Company. Also, the switch can be used on various makes of Black and Decker tools. The switch 10 is a double contact switch so that both sides of the circuit are opened when pressure is released on the lever 19. With the present invention the motor 15 will be started automatically when the lever 19 is pulled down in order to place the drill bit in contact with the work. Thus, the operator's other hand will be left free to hold the work. Furthermore, when the lever or handle 19 is released, the switch will break contact and stop the drill motor 15.

I claim:

1. In combination, a vertically disposed column, a carriage slidably connected to said column, a coil spring circumposed on said column for urging said carriage to its raised position, a tool carried by said carriage, a fulcrum block mounted on said column, a link having its lower end pivotally connected to said fulcrum block, a bracket of U-shape pivotally connected to the upper end of said link, a lever pivotally connected to said bracket

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and provided with a cutout defining a shoulder, a switch housing mounted on said bracket, a headed stud projecting through said bracket and connected to the shoulder on said lever, resilient means on said stud interposed between said bracket and said shoulder, an electric wire extending from said housing to said tool, a plate pivotally mounted in said housing, a pin interposed between said plate and lever, a pair of contacts mounted on said plate and connected to said electric wire, a socket mounted in said housing and adapted to have an electric wire connected thereto, a pair of terminals secured within said housing and electrically connected to said socket, said contacts being mounted for movement into and out of engagement with said terminals.

2. The apparatus as described in claim 1, and further including a coil spring having one end connected to said plate and its other end connected to said bracket.

3. The apparatus as described in claim 1, wherein said tool is an electric drill.

4. In a device of the character described, a vertically disposed column, a carriage slidably connected to said column, a coil spring circumposed on said column for urging said carriage to its raised position, a tool carried by said carriage, a fulcrum block mounted on said column, a link having its lower end pivotally connected to said fulcrum block, a bracket of U-shape pivotally connected to the upper end of said link and including a web and spaced parallel side walls, a lever pivotally connected to said bracket and provided with a cutout adjacent an end thereof defining a shoulder, a switch housing mounted on top of said bracket, a stud projecting through the web of said bracket and connected to the shoulder on said lever, a head arranged on the outer end of said stud, a coil spring circumposed on said stud and interposed between said web and said shoulder, an electric wire extending from said housing to said tool, a plate pivotally mounted in said housing, a pin interposed between said plate and lever, there being a slot in said web for the projection therethrough of said pins, a pair of spaced apart contacts mounted on said plate and connected to said electric wire, a socket mounted in said housing and adapted to have an electric wire connected thereto, a pair of terminals secured within said housing and electrically connected to said socket, said contacts being mounted for movement into and out of engagement with said terminals, and a coil spring having one end connected to said plate and its other end connected to said bracket.

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