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SAFETY SWITCH FOR WELDING HOLDERS

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Fig. 1

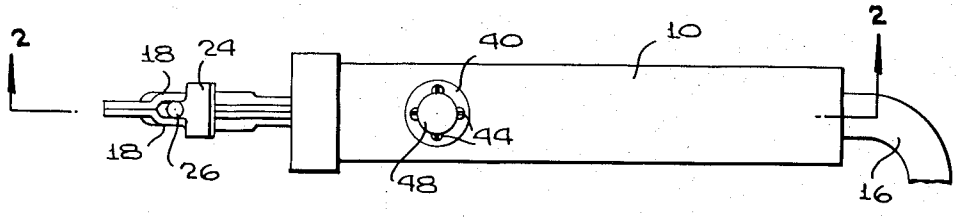
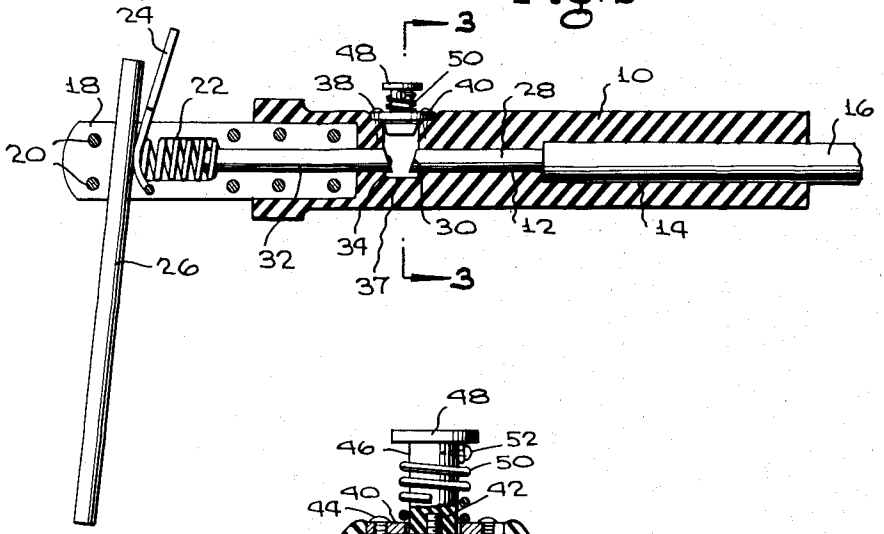


Fig. 2



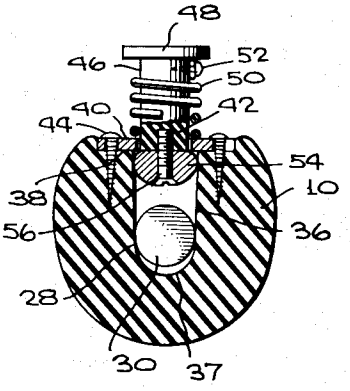


Fig. 3

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SAFETY SWITCH FOR WELDING HOLDERS

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2 Claims. (Cl. 200—157)

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This invention relates to a safety switch for a welding holder, and more particularly to a safety switch of the type stated that is adapted to prevent a circuit from being closed through the welding tool when the tool is not in use.

Accidents tend to occur during the use of a tool of type stated, in that the worker may accidentally cause a circuit to be closed through the tool during welding operations at a time when it is essential that the circuit remain open.

The main object of the invention, accordingly, is to provide a safety switch readily applicable to a tool used in electric welding, said safety switch being depressible by the worker when the tool is held in its natural position during welding operations, the safety switch constituting the present invention being so arranged as to move automatically to a circuit-opening position when the user releases his pressure thereupon.

Another important object is to provide a safety switch of the type stated which can be embodied in conventional welding tool construction without the necessity of extensive modification or redesigning of the tool.

Another important object is to provide a safety switch as described so formed as to cause a good electrical contact to be made when the switch is depressed, thus to assure that the spaced conductor bars bridged by the contact will bear the electrical load equally.

Another important object is to provide a safety switch as described which will be so located when in its inoperative position as to be depressed to a circuit-closing position merely by the user grasping the tool naturally for the performance of the welding operation.

Yet another important object is to provide a safety switch which will be inexpensive to construct, and will comprise a minimum of simply arranged parts.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a top plan view of a welding tool equipped with a safety switch formed in accordance with the present invention;

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

Figure 3 is an enlarged cross-sectional view taken substantially on line 3—3 of Figure 2.

Referring to the drawings in detail, the reference numeral 10 has been applied to the body of a welding tool, said body being formed of an

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insulating material and being provided with a longitudinal bore 12 opening at opposite ends of the body. At one end of the body a counterbore 14 is provided, receiving a conductor 16 through which electrical current is supplied.

Embedded in the other end of the body are longitudinally contacting, flat plates 18 of electrically conductive material, said plates having outwardly offset, intermediate portions and being fixedly connected by rivets 20 or equivalent fastening elements.

The outwardly offset intermediate portions of the plates 18 define a cavity between the plates 18, in which is disposed a spring 22 exerting its pressure against a pivoted lever 24 to force said lever against a welding stick 26.

All this is conventional construction, and does not, per se, constitute part of the present invention, these parts being illustrated and described merely to show their association with the switch, which I have devised.

In accordance with the present invention, an elongated bar 28 of electrically conductive material is embedded within the longitudinal bore 12 of the holder body 10, said bar being connected at one end to the conductor 16, so that an electrical current may be fed through the bar when the tool is being used. The other end of the bar 28 is beveled, as at 30.

A second electrically conductive bar 32 is formed to a circular cross-sectional configuration corresponding to that of the bar 28, and is aligned coaxially with the bar 28 within the bore 12 of the holder body. The bar 32 at one end is in electrical contact with the flat plates 18, and at its other end is beveled, as at 34, the bevel of the second bar being directed oppositely to the bevel of the bar 28, as may be readily noted from Figure 2.

The beveled ends 30 and 34 of the conductive bars project slightly into the lower end of a transverse passage 36 formed in the body and communicating with the bore 12, said beveled ends being disposed slightly above the inner end 37 of the passage, as may be readily noted from Figure 2 or 3, thus to provide clearance for a depressible contact to be described hereinafter, when the engaging surfaces of the contact and of the conductive bars begin to wear after long usage. The outer end of the passage opens upon the outer surface of the holder body and communicates with a shallow recess 38 formed in said outer surface of the body.

A mounting plate 40 is seated in and is formed complementarily to the recess 38, and is secured

fixedly to the holder body by a plurality of screws **44** or equivalent fastening elements. In the present instance, four screws have been illustrated, but more or less can be employed, if desired.

It is believed sufficiently obvious as not to require special illustration, that, if desired, the mounting plate **40** need not be recessed within the surface of the holder body, and can instead be mounted directly against, or even elevated above, said surface.

Formed in the mounting plate **40** is a center opening **42** formed to a diameter smaller than the diameter of the passage **36** and registering with said passage. A stem **46** of insulating material is slidable within the opening **42**, the outer end of the stem projecting beyond the surface of the holder body, and the inner end of the stem extending into said body. Formed on the outer end of the stem **46** is an enlarged head **48**, and abutting at one end against the head **48** is a spring **50** through which the stem extends. The other end of the spring **50** abuts against the mounting plate **40** and is fixedly secured to the mounting plate.

A small screw **52** is threaded into the stem **46** contiguous to the head **48**, and the upper end of the spring **50** is looped about said screw and is fixedly connected to the stem through the medium of the screw. As a result, the spring, being fixedly secured at its opposite ends to the stem and mounting plate, respectively, prevents rotation of the stem within the opening **42**, while still permitting axial sliding movement of the stem.

Secured to the inner end of the stem **46** is an electrical contact **54** of conductive material having oppositely beveled sides (Figure 2) that are complementary to the beveled ends **30** and **34** of the respective conductive bars. The contact **54** has a flat upper surface abutting against the stem, and is secured fixedly to the stem by a screw **56**, or its equivalent.

The upper surface of the contact **54** is of greater area than that of the opening **42**, and as a result, when the spring **50** biases the stem **46** upwardly, the contact **54** engages against the edge of the opening **42** to limit movement of the stem outwardly of the body.

The bottom surface of the stem (Figure 3) is rounded so as to align with the rounded bottom surfaces of the conductive bars **28** and **32** when the item is depressed against the action of the spring **50**.

By reason of the construction illustrated and described, it will be readily appreciated that normally a circuit cannot be closed through the conductive bars **28** and **32** by reason of the fact that the spring **50** tends to bias the stem **46** outwardly of the body, thereby causing the contact **54** to move out of engagement with the respective conductive bars. The depression of the stem **46** against the action of the spring **50** is effective to shift the contact into engagement with the oppositely beveled ends of the conductive bars, causing a circuit to be closed through the bars to the welding stick **26**.

The positioning of the bars **28** at an elevation slightly above the inner end of the passage **36** is effective to compensate for wear of the contacting surfaces of the bars **28** and **32** and of the contact **54**. As this wear occurs, the contact tends to move below the bars, and is permitted this movement while still maintaining a good electrical contact with the conductive bars.

It is believed clear that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor changes in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. In a safety switch for an electric welding holder, the combination with a holder body having a longitudinal bore and a transverse passage communicating with and extending laterally from the bore, said passage having a closed inner end and having an outer end opening upon the outer surface of the body, and with a pair of electrically conductive bars arranged coaxially within said bore, said bars having spaced, confronting, oppositely beveled ends projecting into the passage and spaced from the inner end of the passage, of a stem of insulating material mounted within the passage to slide transversely of the body toward and away from said bars and having its opposite ends disposed within and without the body, respectively; a mounting plate fixed to the holder body and having an opening registering with said passage and formed to a diameter smaller than that of the passage; a spring interposed between and fixedly secured at its opposite ends to said plate and to the outer end of the stem, respectively, and normally biasing the stem outwardly of the body away from said bars; and an electrically conductive contact on the inner end of the stem having its opposite sides formed complementarily to the bevels of said ends of the bars and adapted to bridge said ends upon depression of the stem against the action of the spring for closing of an electrical circuit through the bars, the space between the inner end of the passage and said bar ends providing an open area into which said stem is shiftable on wearing of the bar ends, said contact being enlarged relative to the stem and engaging against the edge of the opening of the plate on biasing of the stem outwardly of the body to limit movement of the stem away from the bars.

2. In a safety switch for an electric welding holder, the combination with a holder body having a longitudinal bore and a transverse passage communicating with and extending laterally from the bore, said passage having a closed inner end and having an outer end opening upon the outer surface of the body, and with a pair of electrically conductive bars of circular cross-section arranged coaxially within said bore, said bars having spaced, confronting, oppositely beveled ends projecting into the passage and spaced from the inner end of the passage, of a stem of insulating material mounted within the passage to slide transversely of the body toward and away from said bars and having its opposite ends disposed within and without the body, respectively; a mounting plate fixed to the holder body and having an opening registering with said passage and formed to a diameter smaller than that of the passage; a spring interposed between and fixedly secured at its opposite ends to said plate and the outer end of the stem, respectively, and normally biasing the stem outwardly of the body away from said bars; and an

electrically conductive contact on the inner end of the stem having a flat upper surface and a curved bottom surface aligning with the bottom surfaces of the bars on movement of the stem inwardly of the body toward the bars, said stem having its opposite sides formed complementarily to the bevels of said ends of the bars and being adapted to bridge said ends upon depression of the stem against the action of the spring, for closing of an electrical circuit through the bars, the space between the inner end of the passage and said bar ends providing an open area into which said stem is shiftable on wearing of the bar ends, the top surface of the contact

being of greater diameter than the diameter of said opening of the mounting plate and engaging against the edge of said opening on biasing of the stem outwardly of the body to limit movement of the stem away from the bars.

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