

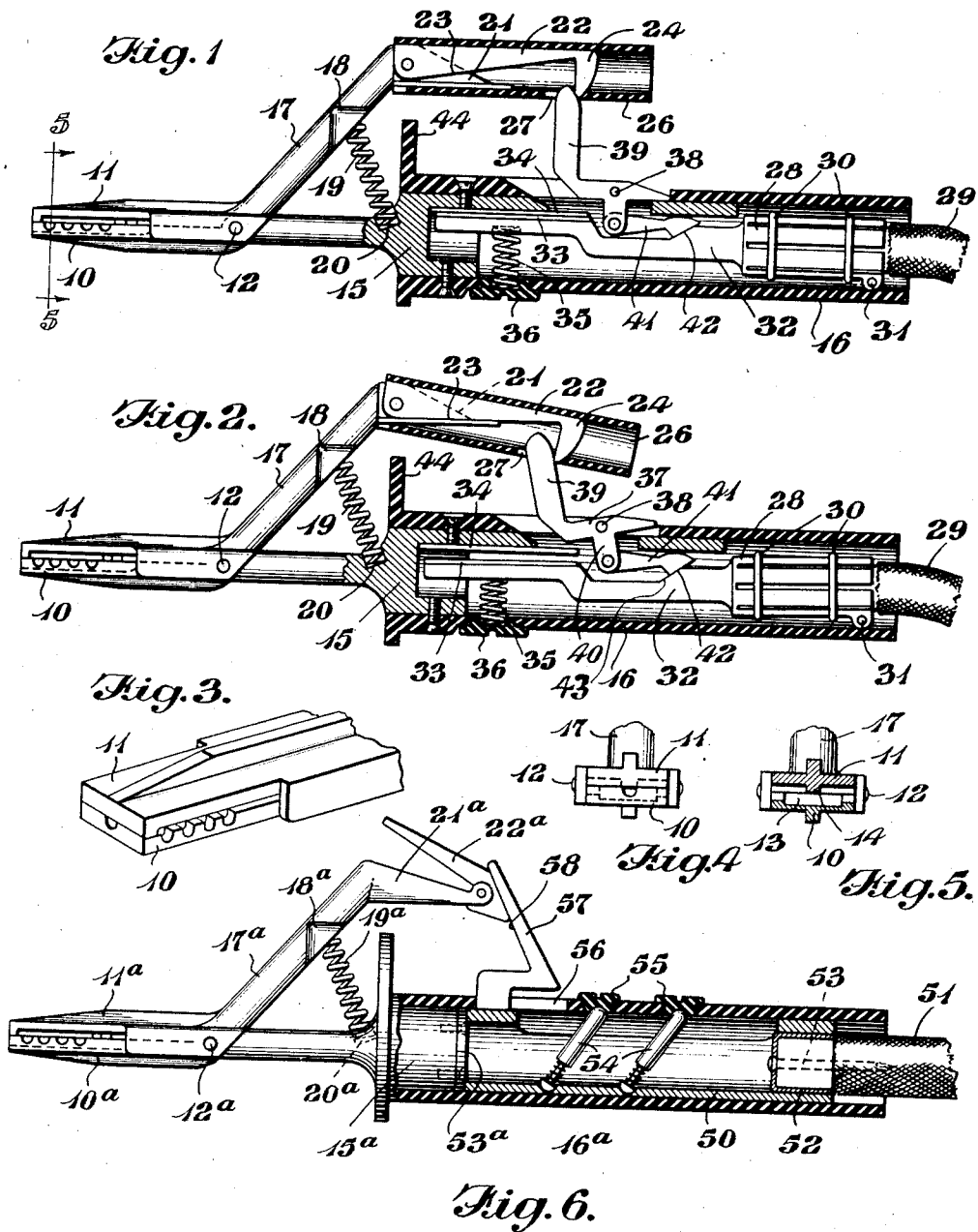
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SAFETY ELECTRODE HOLDER FOR ARC WELDING

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SAFETY ELECTRODE HOLDER FOR ARC WELDING

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8 Claims. (Cl. 219—8)

The invention relates to safety electrode holders for arc welding. In devices of this character it is important to provide a switch mechanism in association with the handle of the electrode holder so that the current may be cut off at certain periods particularly during the process of clamping the electrode. Failure to provide adequate cut-off mechanism has in the past resulted in sever shocks to the operator or in injury to his eyes, should the current pass through the device at a time when his eyes were not adequately shielded. This problem has been recognized by others and it is the principal object of the present invention to provide improved and simplified cut-off mechanism for such electrode holders.

The present application is in the nature of an improvement on the device disclosed in my prior application Serial No. 276,427 filed May 29, 1939, now Patent No. 2,236,849 dated April 1, 1941. In common with the disclosure of my prior application, the electrode holder is preferably of the expansible jaw type, and includes a movable cable or conductor carrier housed within a hollow insulating handle, said carrier in one position completing the circuit through the holder from the cable to the electrodes and in another position breaking said circuit. According to my prior application, means are provided whereby the opening of the cut-off switch must precede the opening of the jaws, and according to the present application the switch is automatically opened as the jaws are separated or just prior to the opening of the jaws, this being one of the important features of the invention.

Another feature of the invention resides in the improvement of the holding jaws.

Still another feature resides in the improvement of the switch mechanism.

A further feature resides in improvement of the cable attaching means.

The invention will be more readily understood by reference to the accompanying drawing and the following detailed description which are given by way of illustration rather than by way of limitation.

In the drawing:

Fig. 1 is a view partly in elevation and partly in longitudinal section showing one form of the electrode holder in normal or working position.

Fig. 2 is a similar view showing the automatic opening of the switch just prior to the opening of the electrode holding jaws.

Fig. 3 is a detail perspective view showing the electrode clamping jaws.

Fig. 4 is a front view of the same.

Fig. 5 is a section on the line 5—5 of Fig. 1, and Fig. 6 is a view partly in longitudinal section and partly in side elevation showing a different form of electrode holder embodying the automatic feature of the invention.

Referring to the drawing in detail the reference numerals 10, 11 indicate a pair of electrode clamping jaws pivoted at 12 and adapted to retain a number of electrodes inserted transversely or a single electrode inserted longitudinally. The jaw 10 is cut away at the center as indicated at 13 and the jaw 11 is provided with a longitudinal rib 14 projecting downwardly. By reason of this construction of jaws 10 and 11 a three point support for transversely inserted electrodes is provided.

As shown the jaw 10 forms an extension of a conductor member 15 mounted at the front end of an insulating handle 16 by means of set screws or the like. The handle 16 may be Bakelite, hard rubber, hard fibre or other suitable material and in addition to the conductor member 15 houses movable switch parts to be hereinafter described. The handle may be provided with an integral guard member 44 similar to that disclosed in my prior application Serial No. 276,427 filed May 29, 1939.

The jaw 11 is provided with an upwardly inclined extension 17 having a socket 18 formed therein to receive one end of a spring 19, the other end of which fits in the socket 20 and serves to normally hold the jaws closed.

At the end of the inclined member 17 is a fixed portion 21 whose lower face is shown as substantially parallel with the face of the jaw 11. To this member is pivotally connected a supplemental member 22 having an inclined surface 23 and an outwardly projecting end portion 24. The fixed member 21 and hinged member 22 are mounted within the tubular insulating jacket 26 which is provided with an opening or slot 27 near the bottom thereof. The jacket 26 is held in place by the pivot pin which connects the members 21 and 22.

Pivotally mounted at 31 within the handle 16 is a cable carrier 28 which is shown as provided with a plurality of longitudinal slots to facilitate insertion of the cable 29 which is then retained in position by rings 30. Projecting forwardly from the cable carrier 28 is a conductor member 32 provided with a copper plate 33 adapted to coact with a corresponding plate 34 secured to the fixed conductor 15. A spring 35 normally urges the plates 33 and 34 into engagement and a screw cap 36 is provided in the lower portion of the

handle to permit access to the spring in assembling the device.

The automatic switch mechanism includes a bell crank member 37 shown as pivoted at 38 in the handle 16 which is slotted at its upper portion to receive the bell crank. One arm 39 of the bell crank extends upwardly and its end projects through the slot 27 in the insulating jacket 26 and is adapted to engage the end portion 24 of the pivoted member 22. The other arm 40 of the bell crank projects downwardly and has pivoted thereto a member 41 which is provided with a cam surface 42 adapted to engage a similar inclined surface 43 formed on the conductor member 32.

When it is desired to remove or insert an electrode or electrodes the insulating handles 16 and 26 may be grasped by the hand of the operator and squeezed together leaving the other hand free. The first effect of this operation is to move the parts from the position shown in Fig. 1 to that shown in Fig. 2 thereby disengaging the contact plates 33 and 34 and breaking the circuit. Further movement of the handle members 16 and 26 toward each other serves to open the jaws 10 and 11 and permits insertion or removal of an electrode or electrodes. This being accomplished the handle 26 is released whereupon the spring 19 comes into effect, closing the jaws 10 and 11 after which the spring 35 comes into effect forcing the plates 33 and 34 into contact and closing the circuit through the handle from the cable 29 to the electrodes held by the clamping jaws 10 and 11.

Fig. 6 shows how the automatic feature may be adapted to an electrode holder including a cable carrier of the sliding type similar to that disclosed in my application Serial No. 276,427 filed May 29, 1939. As shown the jaws 10a and 11a are similar to the corresponding jaws of the first described embodiment of the invention and are pivoted at 12a. The body 10a forms an extension of a conductor 15a which is secured in the front portion of an insulating handle 16a. The body 11a is provided with an upwardly inclined portion 17a having a socket 18a formed therein to receive one end of the spring 19a the other end of which engages in the socket 20a, the spring serving to hold the jaws closed. At the upper end of the inclined portion 17a is a fixed portion 21a substantially parallel to the face of the jaw 11a. A movable member 22a is pivotally connected to the fixed member 21a and in the present case the member 22a is of insulating material and adapted to be grasped by the operator when the jaws are to be opened. The cable carrier 50 is of the sliding type and is adapted to receive a cable 51 which is herein shown as provided with a metal cap 52 preferably of copper and a steel pin 53 which holds the cable in place and extends into the cable. The cable is secured at the rear end of the cable carrier. The carrier is urged into contact with a copper plate 53a at the rear of the conductor 15a by means of a pair of expansible members 54, 54 accessible through removable members 55, 55 in the holder, as set forth in my prior application Serial No. 276,427 filed May 29, 1939.

The holder is provided with a slot 56 through which projects an operating member 57 fixed to the end of the cable carrier and serving to reciprocate the same. The operating member is shown as inclined forwardly and is adapted to be engaged by the rear end of the insulating member 22a.

The operation is similar to that described in the preceding embodiment of the invention. When the handle members 22a and 16a are grasped the first effect is to pivot the member 22a with reference to the member 21a thereby engaging the operating member 57 and forcing the cable carrier rearwardly thus breaking the circuit at the contact plate 53. Further grasping movement opens the jaws 10a, 11a permitting insertion or removal of the electrode or electrodes.

Thus according to both embodiments of the invention an automatic switch is provided to break the circuit through the electrode holder prior to the opening of the holder jaws.

The invention has been described in detail for the purpose of illustration but it will be apparent that modifications and variations may be resorted to without departing from the spirit of the invention as will be apparent to those skilled in the art.

In the two embodiments of the invention the exposed operating members 39 and 57 respectively are preferably formed of insulating material to prevent shock, and the springs 19 and 19a respectively are preferably insulated at their ends, as for example, by the use of fibre inserts in the end sockets.

In connection with the first embodiment of the invention, if it is desired to lay the holder down at any place where there is danger of arcing, the operator may manually press the member 39 forwardly further than would ordinarily be the case when the holders 26 and 16 are merely pressed together, whereupon the member 41 will move far enough to get upon the straight part between members 15 and 32 and thus hold indefinitely or until released by pressing down on the rear end of the member 39 which will insure safety from arcing. This eliminates danger of flashing an arc in the eyes of the operator or helpers when not ready.

I claim:

1. In a safety electrode holder having expansible jaws, a hollow handle connected to one of the jaws, switch means including a cable carrier movably mounted within the handle and adapted to make and break a circuit through said holder, a second handle connected to the other of said jaws and means actuated by movement of the second handle for automatically operating the cable carrier to break said circuit prior to opening the jaws.

2. In an electrode holder or the like, having electrode gripping jaws, a hollow handle connected to one of the jaws, a cable carrier pivotally mounted within the handle at the rear thereof, a conductor member carried at the front end of the handle, contact plates carried by the cable carrier and conductor member respectively, means normally urging the contact plates into engagement with each other, an operating member pivotally mounted within the handle having means engaging the cable carrier for forcing the same out of contact with said conductor member, and a second handle connected to the other of said jaws having means associated therewith for actuating the pivoted operating member.

3. A safety electrode holder having expansible electrode gripping jaws, handles connected to said jaws, a switch member formed in one of the handles for making and breaking the circuit to said jaws, and means cooperating with both handles for actuating said switch to break the circuit prior to opening said jaws.

4. A safety electrode holder having expansible

electrode gripping jaws, handle members associated with said jaws, a switch member carried by one of said handle members which in one position serves to close a circuit through said jaws and in another position to open said circuit, and means associated with the other of said jaws and cooperating with said switch, serving to move the switch to open circuit position prior to the initial opening of the gripping jaws.

5 5. In a welding tong having handles and a gripping member and means urging said gripping member into gripping or closed position; a switch formed in one handle for making and breaking the circuit to said gripping member and including means cooperatively related to said other handle and controlled thereby to open said switch and break the circuit to said tong when said gripping member is opened, said means being movable to circuit closing position when said gripping member is closed.

6. In combination with a welding tong having a gripping member and handle elements therefor; a handle for one of said elements and a combined handle and switch for the other element and means associated with said one of said elements actuating said switch to break the circuit to said welding tong when said gripping member is opened.

7. In a safety electrode holder having expandible gripping jaws, means normally urging the jaws into gripping or closed position, a hollow handle member rigidly connected with one of said

jaws, a second handle member associated with the other of said jaws, a cable mounted within the hollow handle, a switch formed within the hollow member for making and breaking a circuit from said cable to said expandible jaws, and including switch actuating means cooperatively related to said other handle member and controlled thereby to open said switch and break the circuit to said jaws when the said gripping jaws are opened, said means being movable to circuit closing position when said jaws are closed.

8. In a safety electrode holder having expandible gripping jaws, means normally urging the jaws into gripping or closed position, a hollow handle member rigidly connected with one of said jaws, a second handle member associated with the other of said jaws, a cable mounted within the hollow handle, a switch formed within the hollow member for making and breaking a circuit from said cable to said expandible jaws, and including switch actuating means cooperatively related to said other handle member and controlled thereby to open said switch and break the circuit to said jaws when the said gripping jaws are opened, said means being movable to circuit closing position when said jaws are closed, said switch operating means comprising a projection extending through a slot in the hollow member into the path of the second handle member.

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