Dec. 16, 1947. W. A. TERNES 2,432,836

ELECTRODE HOLDER

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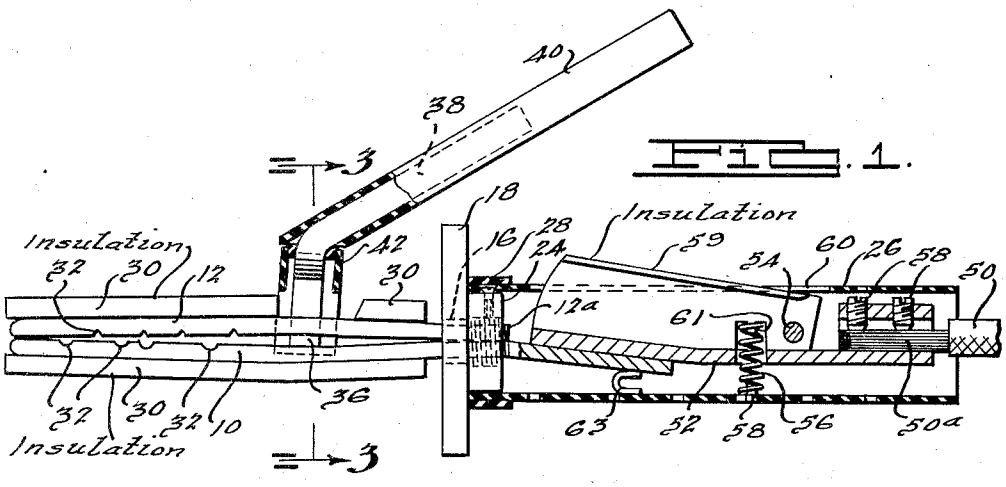


Fig. 1.

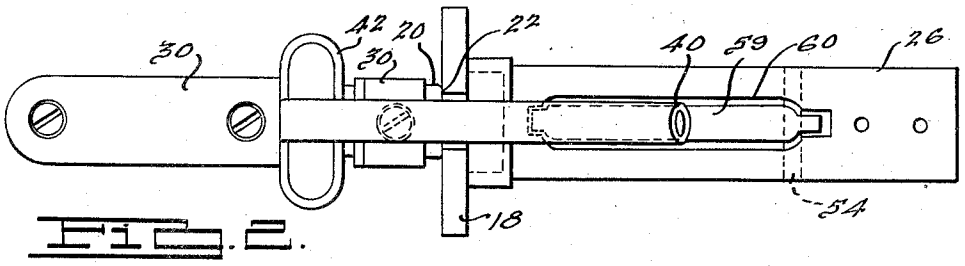


Fig. 2.

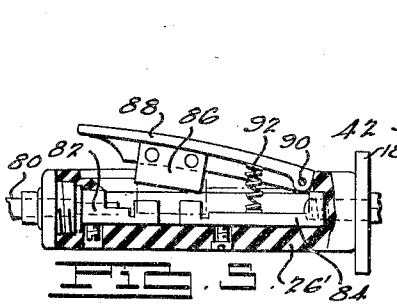


Fig. 5.

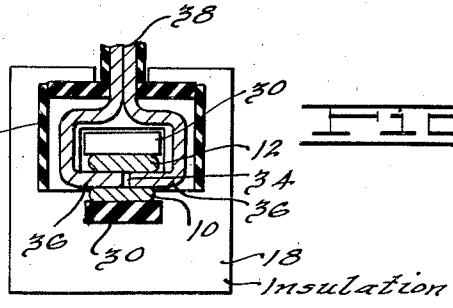


Fig. 3.

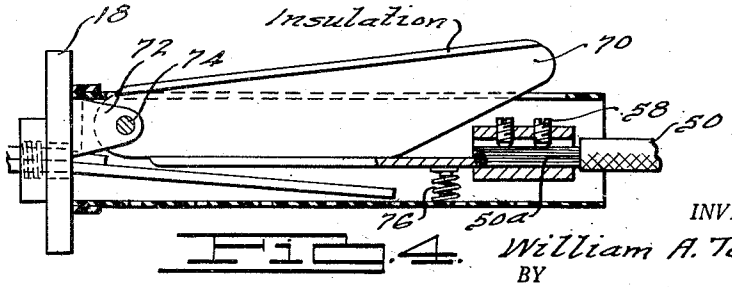


Fig. 4.

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ELECTRODE HOLDER

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1 Claim. (Cl. 219—8)

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The present invention relates to electrode holders of the type embodying switch mechanism to control the connection between the jaws of the holder and the source of current supply, and may be particularly characterized as constructed and arranged to insure that the just-mentioned switch mechanism is opened before the jaws are actuated to release the welding rod.

The principal objects of the present invention are to provide a construction of the above type, which is simple in construction, may be readily and economically manufactured, and which is reliable in operation; to provide a construction comprising generally a jaw assembly to releasably retain a welding rod, a handle for manipulating the jaw assembly, and control elements adjacent the handle for controlling the jaws and for controlling the connection of the holder to the source of supply, the control elements being so arranged as to insure that the switch mechanism is brought to an open condition before the jaws are actuated to release the welding rod; to provide such an arrangement wherein the control elements are accessible to the hand of the operator which carries the holder, but wherein, in grasping the jaw control element, the operator is required to release the switch control element; and to generally improve and simplify the construction and arrangement of electrode holders.

With the above as well as other and more detailed objects in view, which appear in the following description and in the appended claim, preferred but illustrative embodiments of the invention are shown in the accompanying drawing, throughout the several views of which corresponding reference characters are used to designate corresponding parts and in which:

Figure 1 is a view in side elevation, partly in longitudinal section, of one embodiment of the invention;

Fig. 2 is a top plan view of the structure of Fig. 1;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary view of a modification of the invention; and

Fig. 5 is a fragmentary view of a further modification.

Referring first to Figs. 1, 2 and 3, the holder is illustrated as comprising, generally, a pair of blade-like jaws 10 and 12, which may, as will be understood, be formed of conductive material having spring-like characteristics. At its inner end 12a, the jaw 12 is rigidly secured to the jaw 10, by a nut 24 which is threaded onto jaws 10 and 12

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and forcibly holds them together. The rear end of jaw 12 and the corresponding portion of jaw 10 are substantially semicircular, and when placed together, define a circular, externally threaded shank to receive the nut 24. In assembly, the jaws 10 and 12 are passed through an aperture 16 provided therefor in a usual guard plate 18, and which aperture is larger than the just-mentioned shank. The jaws 10 and 12 are widened immediately adjacent the guard 18, as is indicated at 20, so as to define shoulders 22, which abut the outer face of the guard. The guard 18 is held against the just-mentioned shoulders by the previously mentioned nut 24. The inner face of the nut 24 abuts the corresponding face of the guard 18 and maintains the jaws and guard in rigidly assembled relation to each other. The nut 24 also affords a mounting for a usual tubular handle 26, which, like the guard 18, may be and preferably is formed of insulating material. The handle 26 is secured to the nut 24 by means of a usual set screw, and preferably and as shown, a rubber sleeve 28 is fitted over handle 26 to conceal the set screw.

In accordance with conventional practice, the outwardly projecting portions of the jaws 10 and 12 may be and preferably are provided with overlying strips of insulation 30, which may be secured thereto in any suitable manner.

It will be understood that the spring-like character of the jaws 10 and 12 normally biases them to a position in which they are effective to grip the welding rod between them, the inner faces of the jaws being provided with variously arranged rod receiving grooves 32.

In order to forcibly separate the jaws, a cam 34 is introduced therebetween. This cam is constituted by the inwardly turned lugs 36 of an adjusting member 38, the rectangular aperture in which accommodates the jaw 12 and its insulator 30, and which member 38 is slipped over the jaw 12 before the latter is secured to the jaw 10. The upper end of the member 38 is bent at an angle so that it extends rearwardly toward the handle 26 and is provided with an extended, enclosing grip 40, which may be and preferably is formed of insulating material. The lower and box-like portion of the adjusting member 38 is also preferably provided with an enclosing sheath 42, preferably formed of insulating material.

As thus far described, it will be appreciated that the electrode holder is of generally conventional construction. The handle 26 is adapted to be conventionally grasped within a hand of the operator and, while the handle 26 is so grasped

with the under surface of the handle 26 resting against the fingers of the operator, the operator's thumb may be passed over the adjusting lever 40. By applying pressure between his thumb and fingers, the operator is enabled to draw the lever 40 toward the handle 26, thereby rocking the cam 34 and forcing the outer ends of the jaws apart. Conversely, the handle 26 may be rested between the thumb and palm of the operator, enabling the fingers to be extended over and operate the lever 40.

In accordance with the present invention, it is proposed to provide the electrode holder with switch mechanism for controlling the connection between the jaws 10 and 12 and the source of power, illustrated as a usual welding cable 50. As shown, this switch mechanism is carried by the handle 26 and while, in the more generic aspects of the invention, this switch mechanism may comprise a pilot switch which serves to control a remotely located main switch, it is preferred, as shown, to have this handle mounted switch mechanism directly control the connection between the jaws and the source of power. As shown, the handle 26 is provided with a movable switch blade 52, pivotally mounted therein by means of a pin 54, which is journalled in the respectively opposite side walls of the handle 26. A compression spring 56, seated between the blade 52 and the wall of the handle, serves to continuously bias the blade 52 to a position in which it is out of engagement with the extended inner end of the lower jaw 10. Spring 56 is held in place by means of projections 58 and 61, over which the spring is fitted. The rear end of the switch blade is rigidly but separably connected to the inner end 50*a* of the cable by means of set screws 58.

The switch blade 52 is provided with an operating fin 59, which may be and preferably is formed of insulating material, and the upper edge of which projects outwardly of the handle 26 through a slot 60 provided therein. The parts are shown in the closed circuit position, in which the blade 52 conductively engages the jaw 10 and in which the fin 59 projects outwardly of the slot 60 to only a relatively slight extent. If desired, and as shown, a light spring 63 may be interposed between the handle 26 and jaw 10 to bias the latter in firm engagement with blade 52, although, in practice, the inherent resilience of jaws 10 and 12 is sufficient for this purpose.

It will be noticed that the handle 26, fin 59 and lever 40 are in substantial vertical alignment with each other and that when the operator grasps the handle 26, as aforesaid, he naturally applies sufficient pressure to the fin 59, through the palm or fingers of his hand, to hold it in the closed circuit position against the opposing force of the spring 56. If he releases the pressure of his hand against the fin 59, however, spring 56 becomes effective to swing the blade 52 in a clockwise direction, to a position in which its inner end is separated from the jaw 10. This swinging movement involves some relative movement between the cable 50 and the electrode holder, as a whole, which relative movement is, however, readily permitted by the relatively flexible character of the cable 50. It will be understood, also, that this release of the switch blade 52 does not usually take place until the operator has lifted the welding rod away from the work, which latter action interrupts the flow of current through the unit. In usual practice, therefore, the separating movement of the blade 52 does not involve the drawing of an arc.

In view of the fact that the fin 59 lies between the lever 40 and the handle 26, it will be appreciated that the operator cannot adjust his hand in such a way as to enable him to grasp the lever 40 and separate the jaws 10 and 12 without first relieving the pressure of his hand on the fin 59. Any attempt on the part of the operator, therefore, to grasp the lever 40 relieves the pressure on the switch blade 52 and results in an opening movement of the latter. This feature makes it impossible for the operator to attempt to adjust or replace his welding rods without first disconnecting the electrode holder from the source.

In the modified embodiment shown in Fig. 4, the arrangement is the same with the exception that in this case the switch blade 70, shown in the normal open-circuit position, is pivoted to the guard 18 by means of a bracket 72 secured to the latter and a cooperating pivot pin 74. In this case, also, the biasing spring 76 acts between the switch blade 70 and the handle 26 and serves to continuously bias the latter to an open position.

A further modification is fragmentarily shown in Fig. 5 and may be characterized in that the cable 80 is electrically connected to a switch element 82, which is rigidly secured within the handle 26'. The cooperating fixed element 84 is secured to the jaw assembly. Elements 82 and 84 are adapted to be bridged by a member 86, which is secured to an operating member 88 formed of insulating material. Member 88 is pivoted at 90 to the insulating handle 26' and is yieldingly biased to the open position by means of a spring 92. In all other structural respects, and in operation, it is believed to be apparent that this embodiment may be and preferably is the same as the previously described embodiments.

Although only several specific embodiments of the invention have been described in detail, it will be appreciated that various further modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

In an electrode holder, the combination of a jaw assembly embodying elements to releasably retain welding material, a handle by which the jaw assembly may be manipulated, switch mechanism for controlling the connection between the jaws and a source of power and including a switch operator for actuating said mechanism between circuit-interrupting and making positions, an operator for controlling said jaw elements, each said operator being actuable independently of the position of the other and both said operators being actuable by a hand of a user while the handle is supported by such hand, said operators being so positioned relative to each other that the user cannot so actuate one said operator without releasing the other operator.

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