May 8, 1945. H. A. JACKSON 2,375,657

ELECTRODE HOLDER

Filed June 16, 1943

FIG. 1.

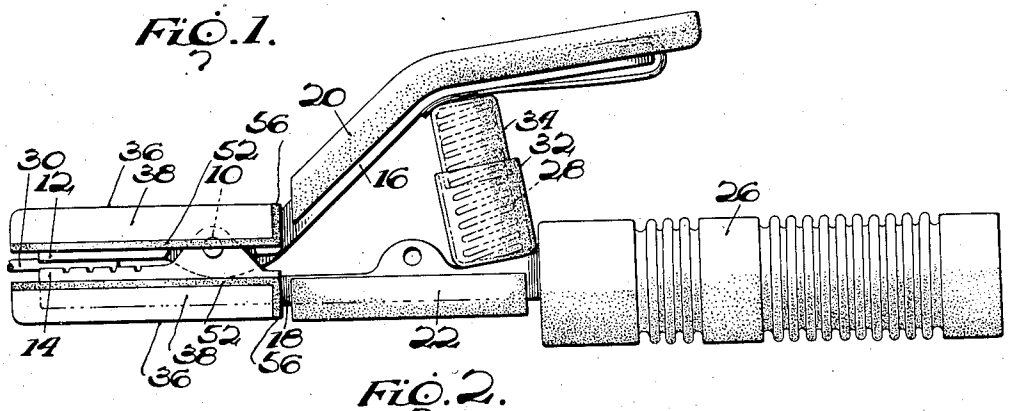
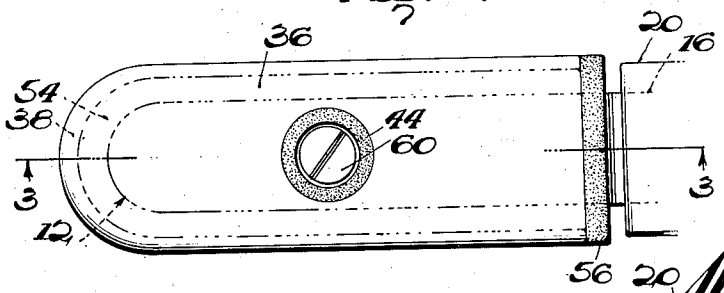


FIG. 2.



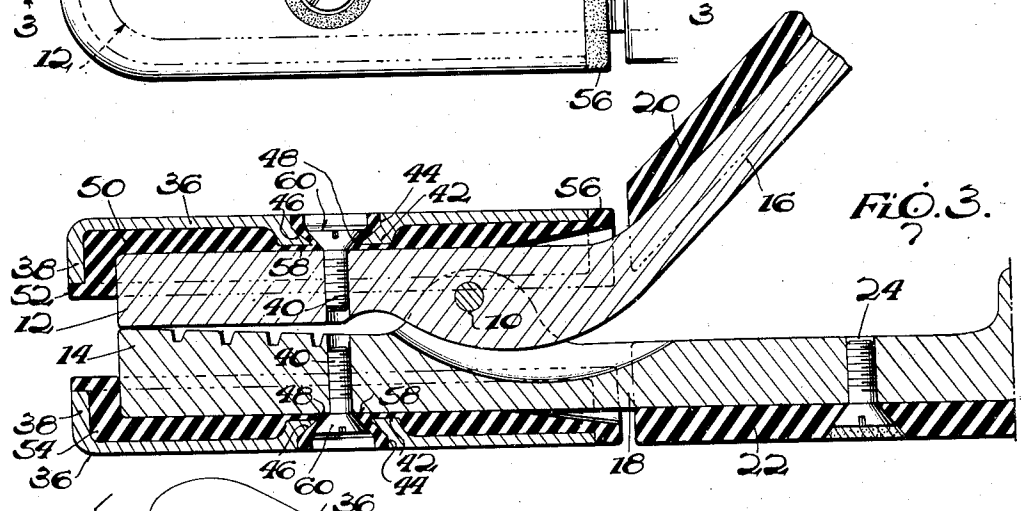


FIG. 3.

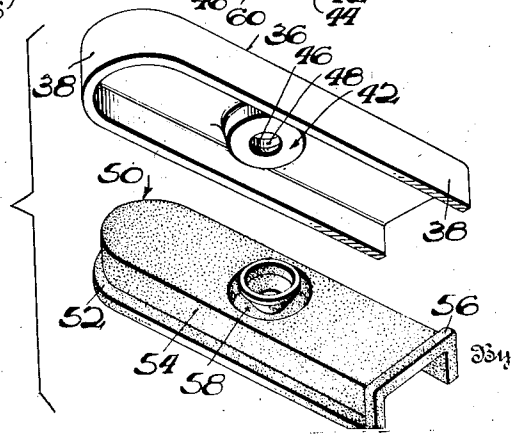


FIG. 4.

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ELECTRODE HOLDER

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Application June 16, 1943, Serial No. 491,079

2 Claims. (Cl. 174—138)

This invention relates to electrode holders and has particular reference to improved insulation of the electrode clamping jaws.

An object of the invention is to improve the efficiency of operation of such holders by eliminating the need for frequent replacement of the insulation associated with the clamping jaws. More specifically, it is among the objects of the invention to so insulate the jaws of an electrode holder that the tool will have a longer useful life in operation without need for replacement of this important structural part of the combination.

Heretofore common practice has been to shroud the clamping jaws of the tool with insulation material of channel shape in substantially the same manner that the operating handles of the tool are insulated. This type of insulation shrouding is disclosed incidentally in the drawing of this application, and is illustrated and described in detail in Patent No. 2,300,295.

The type of insulation formerly used, consisting of a relatively thick layer of insulating material molded into channel shape positioned over the clamping jaws and secured thereto, was fairly satisfactory so long as it withstood the heat developed by the electrode arc and so long as it remained intact despite blows against other objects to which it was subjected during normal usage by the operator.

High heat developed in the metal jaw of the holder and transmitted to an insulation shroud of the type above described in contact therewith causes breakdown of the resinous binder constituent of the insulating material and consequent distintegration of the shroud. This necessitates frequent replacement with consequent loss of time and labor. Normal usage of such a holder entails rough handling of the tool, and damage to an exposed insulation shroud by reason of breaking or cracking is so frequent that replacement, with consequent additional cost and loss of time and labor, is a distinct problem with which the industry has heretofore been forced to cope.

My invention involves sheathing in metal a jaw insulating shroud to form a composite insulating member. Accomplishing this in relatively simple fashion by means easily manufactured and assembled, and readily secured firmly to the jaws in rigid juxtaposition thereto so that it will remain rigid therewith over long periods of rough handling, presents certain problems.

The means for securing the insulation to each jaw, preferably a screw threaded into the jaw itself as generally used in the past, must be insulated from the metal sheathing or shell to prevent arcing on contact of the sheathing with exterior metal. The expedient of providing an opening in the metal sheathing of considerably greater diameter than the diameter of the small concentric opening in the insulation layer below the sheathing through which the fastening screw passes, and countersinking the aperture in the insulation layer so that the head of the screw will lie flush therewith but not contact the surrounding wall of the aperture in the metal sheathing has not proved satisfactory. One reason is because of the fact that the screw head bears entirely on the insulation material which absorbs the entire stress required to hold the composite insulating member firmly in place over the jaw of the holder. This stress set up in the insulation material together with the heat developed therein when the tool is in use tends to crack and cause disintegration of that portion of the insulation layer immediately surrounding the screw head and against which it bears, thus necessitating replacement of the insulation material.

An important feature of my invention resides in the fact that the composite insulating member comprising an outer sheathing of metal and an under layer of insulation material is so constructed and arranged that the stress set up by the screw head when the member is secured to the jaw of a holder is absorbed entirely by the metal of the sheathing, although such metal is on the outside and the insulation is on the underside when the member is screwed into position over the jaw of a holder.

Various other objects and meritorious features of the invention will become apparent from the following description taken in conjunction with the drawing, wherein like numerals refer to like parts throughout the several figures, and wherein:

Figure 1 is a side elevation of a tool embodying my invention;

Fig. 2 is an enlarged top plan view of the clamping jaw of a tool equipped with my improved insulating member;

Fig. 3 is a section along 3—3 of Fig. 2, and

Fig. 4 is an exploded view illustrating in perspective the two component elements of the composite member.

Referring now to the drawing, Fig. 1 illustrates a more or less conventional electrode holder comprising upper and lower arms pivoted by means of a pin 10 to provide upper and lower clamping jaws 12 and 14, respectively, and upper and lower operating handles 16 and 18, respectively. The upper handle is shrouded with insulation 20 of channel shape which is laid over the outer face of the han-

dle and secured thereto in a manner well known in the art and particularly illustrated in Patent No. 2,300,295. The side walls of the channel overhang the side walls of the operating handle and protect the operator from contact with the metal of the handle on each side as well as on the outer surface thereof, as more clearly illustrated in Fig. 3.

Similar channel-shaped insulation **22** is secured by means of screw **24** over the under face of that portion of the lower operating handle immediately to the rear of the clamping jaw. The rear or free end of lower operating handle **18** is provided with conventional means for coupling the same into an electric circuit and is shrouded by a gripping sleeve **26** of insulating material, thus completing insulation of the tool on its outer surfaces except for the clamping jaws **12** and **14**.

Opposite ends of a helical spring **28** are seated in conventional manner against the opposed inside faces of upper and lower operating handles **16** and **18** and serve to force the jaws together for holding an electrode indicated in Fig. 1 by the numeral **30**. The spring may be insulated in conventional fashion, telescoping cups **32** and **34** of insulating material being indicated for purposes of illustration in Fig. 1.

The composite jaw insulating members comprising my invention are identical for both upper and lower clamping jaws. Each comprises an outer metallic shell **36** having a depending skirt **38** extending around the margin thereof, the shell being rounded at the nose and open at its rear end.

Centrally disposed in the top face of the shell is an opening adapted to receive fastening screw **40**, which opening is so positioned as to be in alignment with a threaded opening in the jaw of the holder to receive the screw when the insulation member is positioned over the outer face of the jaw. The opening in the top of the shell is formed by means of a depending annular boss broadly indicated by the numeral **42** so formed as to provide a countersink **44** flush with the top face of the shell and of greater diameter than the head **60** of the fastening screw to be inserted therethrough. The lower part of the inside face of annular boss **42** is tapered radially inwardly as indicated at **46**, the taper angle being substantially that of the taper of the under face of the head of the fastening screw. The opening **48** at the end of the taper on the inside of the shell is of greater diameter than the diameter of the fastening screw **40**. The depth of the boss is somewhat less, preferably, than the depth of the screw head **60** to be seated therein for reasons which will be apparent.

Seated within the metallic shell is a layer of insulation broadly indicated by the numeral **50** which conforms in contour to that of the shell and may be flanged as indicated at **52** around the free edge of its skirt **54** to provide a seat for the bottom of skirt **38** of the metallic shell. The rear of the insulation layer may be flanged around its rear end as indicated at **56**, and the depth of this flange, like the flange **52**, is preferably the thickness of the adjacent metal to provide smooth surfaces throughout over the exterior of the composite member and protect the outer edge of the shell skirt **38**.

The thickness of the insulation underlying the top face of the metallic shell **36** is somewhat greater than the depth of annular boss **42** and extends across the under face of such boss as indicated at **58**, up over the tapered wall **46** on the inside of the boss and into countersink **44** lying in the plane of the top face of the metal shell.

The thickness of the insulating material thus lining the inner wall of the opening formed by annular boss **42**, and the diameter, shape and size of screw head **60**, are such that the outer surface of the screw head bears continuously upon the surrounding insulation material when the same is inserted through the opening and threaded down into the jaw to fasten the composite assembly over the outer face thereof, the top of the screw head lying flush with or a little below the top face of the metal shell **36**.

Thus the screw head **60** is insulated completely from contact with the metal sheathing surrounding it but the stress exerted by the tapered face of the screw head to retain the composite insulating member firmly in position over the clamping jaw is absorbed by the metal of annular boss **42** and not by the insulating material in immediate contact therewith. Transfer of the fastening stress and strain from the insulation to the metal boss **42** substantially eliminates the danger of injury to that part of the insulation against which the head of the fastening screw bears and materially lengthens the useful life of the jaw insulation. The metal shell is completely insulated from the clamping jaw and can absorb rough treatment over a long period of time without injury to the underlying layer of insulation.

The insulation layer may be associated with the metallic sheathing in any desired manner, preferably being flowed into position with the use of suitable molds and allowed to harden.

Having described a preferred embodiment of the invention, various modifications will be apparent to those skilled in the art and for that reason I wish to limit myself only within the scope of the appended claims.

What I claim:

1. An insulating member comprising a channel-shaped metal shell, a portion of the wall of said shell extending inwardly to provide an annular boss forming an opening in the shell, said boss being so shaped that the wall of said opening tapers inwardly, and insulation material juxtaposed substantially coextensively with the inside of the channel of said shell, said insulation material being of a thickness somewhat greater than the depth of said boss and extending over the inside face thereof and over the wall of the opening formed thereby to form an opening adapted to receive the enlarged head of a metal fastening member and insulate the same from the metal of said boss.

2. An insulating member for the clamping jaw of an electrode holder comprising an open channel-shaped metal shell having a plane upper face and a skirt extending normally thereto around the entire margin thereof except a portion adapted to receive the clamping jaw, a portion of the upper face of said shell extending inwardly to provide an annular boss forming an opening in the shell, said boss being so shaped that the inner face of the opening therethrough tapers inwardly of the shell, and insulation material juxtaposed substantially coextensively with the inside of said shell, said insulation material extending over the inside face of said boss and over the tapered inner face of the opening formed therethrough.

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