June 5, 1945. A. R. STALKUP 2,377,458

ELECTRODE HOLDER

Filed April 8, 1944

Fig. 1.

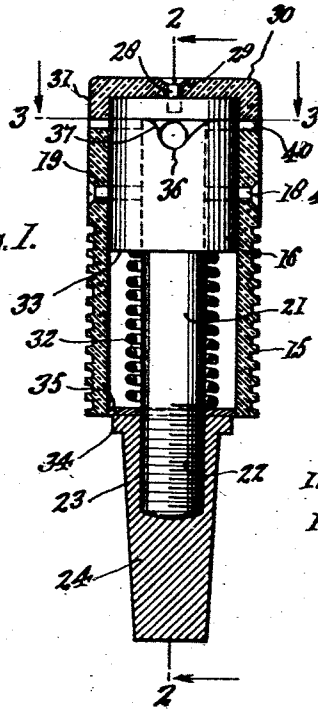


Fig. 3.

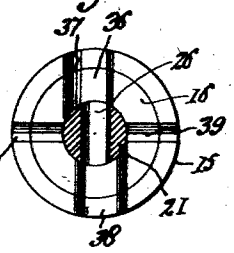


Fig. 4.

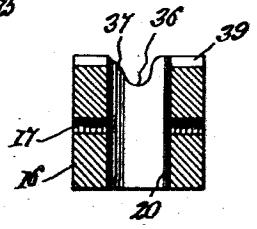


Fig. 2.

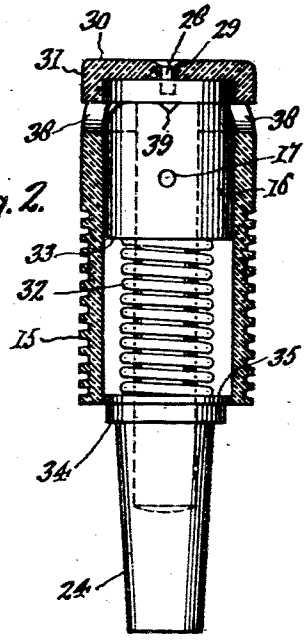
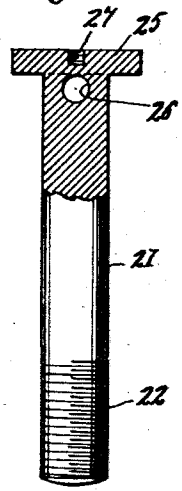


Fig. 5.



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2,377,458

ELECTRODE HOLDER

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Application April 8, 1944, Serial No. 530,173

3 Claims. (Cl. 219—8)

The present invention relates to improvements in electrode holders, and more particularly relates to that type of electrode holder employed in electric welding where the work is in circuit with the holder.

With the advent of women in industry emphasis has been placed upon the extreme lightness of welding tools and the adaptability to persons with small hands and these desiderata are prime objects of the present invention coupled with simplicity of construction, small cost of production and the limitation of the tool to small compass to take advantage of the small hands of women in introducing the tools through openings or into cramped quarters or angles.

The improved tool also possesses new factors of safety and insulation and increased gripping ability upon the electrode.

It is a further object and purpose of the invention to provide an electrode holder in which the parts are few, readily assembled, readily adjusted and subject to quick manipulation in introducing and freeing the electrode.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawing, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a longitudinal section taken through one form of electrode holder constructed in accordance with the present invention.

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

Figure 3 is a transverse section taken on the line 3—3 of Figure 1.

Figure 4 is a longitudinal section taken through the collar member.

Figure 5 is a side view, with parts broken away and parts shown in section, of a form of pin or shaft employed.

Referring for the present to Figures 1 to 5 inclusive 15 designates the insulated handle of the electrode holder which may be corrugated if desired, this handle being in the form of a cylinder open at both ends.

Received into this cylinder and non-rotatively affixed in the upper portion thereof is a metal collar 16 with its upper end substantially flush with the upper end of the tubular handle 15. The collar 16 may be held in the handle 15 in any suitable manner. As shown in Figure 4, diametrically opposite threaded openings are made in the wall of the collar 16 to receive set screws 18 which are introduced through countersunk openings 19 in the side walls of the tubular handle 15.

The collar is traversed by an axial bore 20 through which slidably and rotatably fits the shank 21 of a metal pin or shaft smooth walled throughout the major portion of its length but having a threaded terminal section at its free end portion adapted to mate with the threads of the internal socket 23 on the connector member 24.

As shown more particularly in Figure 5 the head 25 of the pin 21 extends above a transverse aperture 26 made all the way through the shank 21 from side to side. In the head 25 may be made a threaded socket 27 to receive a set screw 28 fitting through a countersunk performation in the top wall 30 of an inverted cup shaped insulating cap, the depending flange of which is indicated at 31. The flange 31 is of substantially the same diameter as the shell or handle 15 and fits down upon the upper edge of such handle 15 in the normal position of the parts.

A coil spring 32 is wound in a suitable number of convolutions about the shank of the pin 21 with the upper end of the helix engaging the bottom of the collar 16 and the lower end of such helix contacting a washer 35 which reposes against a flange 34 on the upper end of the conical connector 24. The washer 35 is of a diameter to rather snugly fit within the cylindrical wall of the insulated handle 15 but capable of axial sliding movement therein. The flange 34 is preferably slightly short of this diameter to enable the peripheral edge of the washer 35 to have a slight flexing movement when driven upwardly to relieve any air that may tend to be compressed within the handle 15, although the handle may have perforations to permit breathing of the space surrounding the helical spring 32.

Referring to Figures 3 and 4, the upper end of the collar 16 has produced therein a pair of diametrically opposed substantially parabolic recesses 36, one wall 37 of which is modified from the true parabolic curve in order to be less severe and more gradual.

As shown in Figure 2 the wall of the shell handle 15 at the upper end thereof is formed with a pair of similar recesses 38 registering with said parabolic recesses 36 of the collar 16.

The upper portions of the recesses 36 and 38 open upwardly. As shown more particularly in Figures 3 and 4 the upper end of the collar 16 has made therein a pair of diametrically opposed notches 39, preferably V-shaped in cross section

with the apices directed downwardly and the divergent side walls opening upwardly through the upper edge of the collar **16**; such pair of V-shaped notches **39** being disposed at 90° or right angles to the diametric line connecting the centers of the parabolic recesses **36**.

In the operation of the device, with the parts shown in Figures 1 and 2, an electrode has an end introduced through the recesses **38** and **36** until the leading end of the electrode appears upon the other side of the handle. With the parts shown in Figure 2 this is comparatively easy on account of the registration of the recesses **38** and **36**. In so introducing the electrode the same will be caused to pass through the transverse aperture **26** of the pin shank **21**. The pin **21** is now rotated relatively to the handle **15**. For instance the handle **15** may be held stationary while the connector **24** is rotated which will carry the pin **21** around and also the insulating cap **30**. Due to the electrode's engagement in the transverse aperture **26** of the pin **21**, such electrode will likewise be rotated relatively to the handle and collar **16**. The rotation will preferably be through an angle of approximately 90° and in a direction to cause the opposite projecting end portions to ride up the less severely inclined walls **37** of the recesses. In riding up these walls the electrode will cam the pin **21** axially outward causing the head **25**, and with it the insulating cap **30**, to move away from the collar **16** and from the handle **15**. The quarter turn will cause the electrode end portions to arrive at the pair of notches **39**, which notches are also repeated at **40** in the upper end of the handle **15**. When the end portions of the electrode arrive in registry with the V-shaped notches **39** they will snap into the same due to the potential energy of the coil spring **32**. Such coil spring will be compressed as the pin **21** is cammed upwardly incident to the relative rotation of the parts just described and the riding of the electrode ends on the inclined walls **37**. The energy of the coil spring will become kinetic when the electrode ends arrive above the notches **39**. Consequently this coil spring **32** will exert strong and continued force to draw the head **25** down upon the electrode and to force upwardly the collar **16** upon such electrode ends, thus clamping the electrode securely in place. The electrode may be removed by endwise pressure downwardly upon the handle **15** while the connector **24** is held immovably against a table or rigid surface. When an electrode is to be subsequently replaced in the holder, the pin **21**, through the connector **24**, may be rotated to bring the transverse aperture **26** into alignment with the recesses **36** and **38**.

When the electrode is removed, the coil spring **22** expands and closes the insulating cap flange **31** upon the handle **15** thus enclosing all of the conductor parts and preventing possible arcing and burning or other injury to the person or to the materials.

Such holder will retain without adjustment any rod electrode from the smallest to the largest made, depending upon the size of the holder and the size of the hole **26** through the shaft **21** and the sizes of the parabolic recesses **36** and **38**. The base connector **24** is preferably tapered. Over this tapered surface the lead fits and is held by friction.

What is claimed is:

1. An electrode holder comprising an insulated handle of tubular form open at both ends having diametrically opposed recesses and diametrically opposed notches angularly offset from the recesses, a tubular metallic collar secured in the outer portion only of said insulated handle and having recesses and notches registering with the recesses and notches of said insulated handle, a shank slidingly and rotatably fitted through said collar and having a transverse aperture to receive the electrode, a connector member connected to said shank, spring means in said insulated handle constructed and arranged to yieldingly force said collar and connector away from one another, a head on said shank outwardly of the transverse aperture for closing against the outer end of said collar, and an insulated cap on said head having an inwardly projecting flange for closing against the outer end of said insulated handle.

2. An electrode holder as claimed in claim 1 characterized by the fact that the spring means is a coil spring wound about said shank in a chamber confined within said tubular insulated handle in that part unoccupied by said collar, and means for closing the end of said chamber opposite to said collar.

3. An electrode holder according to claim 1 wherein a chamber is formed for the spring means within that portion of the insulated handle unoccupied by said collar, and wherein the connector member forms a shoulder with said shank, and a flexible washer seated on said shoulder and fitting in the end portion of the chamber opposite the collar, said washer fitting tightly against the wall of the chamber, said shouldered portion of the connector member being of less diameter than that of the washer and less than the internal diameter of the chamber wall.

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