Feb. 11, 1947. R. A. WELCH 2,415,778

ELECTRODE HOLDER

Filed April 30, 1945

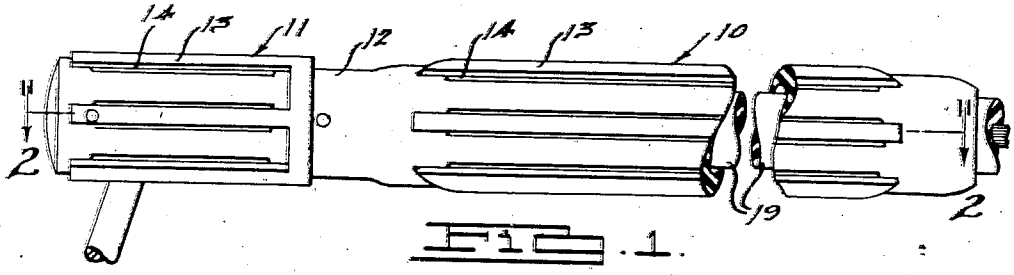


Fig. 1.

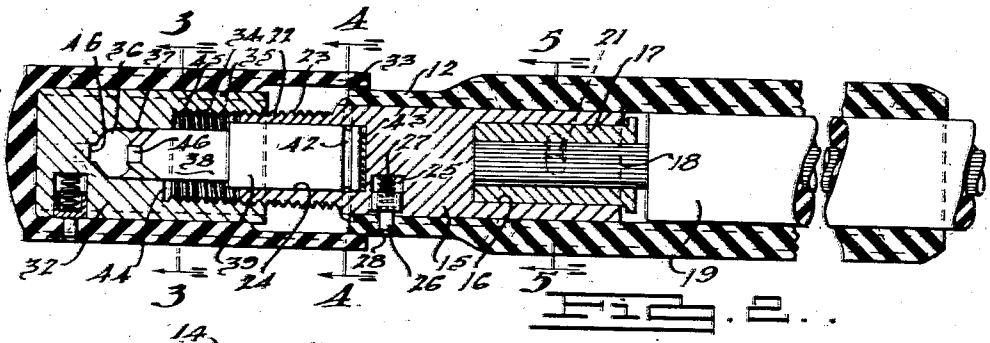


Fig. 2.

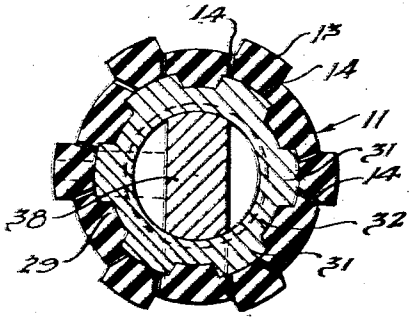


Fig. 3.

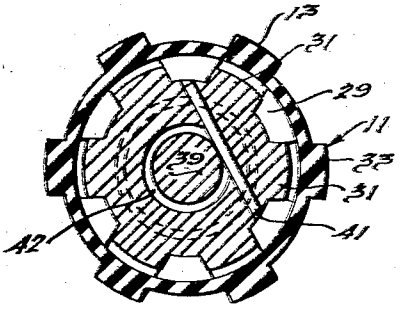


Fig. 4.

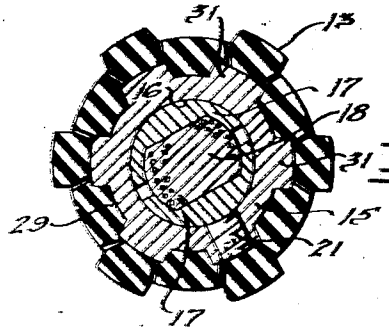


Fig. 5.

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Patented Feb. 11, 1947

2,415,778

UNITED STATES PATENT OFFICE

2,415,778

ELECTRODE HOLDER

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Application April 30, 1945, Serial No. 591,022

9 Claims. (Cl. 219—8)

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This invention relates to electrode holders and primarily to an electrode holder of the screw cap type by which the welding rod is clamped and released.

The electrode holder of the present invention is an improvement over the electrode holder illustrated, described and claimed in the application for Letters Patent of Russel A. Welch, Serial No. 529,562, filed April 5, 1944. The electrode holder embodies an insulating handle having a cable terminal therein which is supported in position by a spring-pressed pin. The terminal has an aperture in one end in which the end of the cable is inserted and secured in conducting relation thereto while the opposite end contains an aperture and an external thread. A clamping anvil has a round body portion of a diameter to extend within the aperture in the threaded end of the terminal where it is retained in position by a pin projecting into a slot therein. This permits the anvil to rotate relative to the terminal in which it is supported. Preferably a washer of conductive material, such as copper, is disposed between the bottom of the aperture and the body portion of the anvil to form a bearing between the surfaces when the anvil is forced in position to clamp the welding rod.

An insulated cap is mounted in telescoped relation over the end of the insulating handle and contains a conducting head which is secured thereto by a similar spring-pressed pin which secures the terminal to the handle. The head contains an internal thread which extends over the thread of the terminal and a rectangular slot into which the anvil projects and is moved longitudinally relative thereto. The shoulder of the slot formed with the thread is of shorter length at one side than at the other for the purpose of permitting the latter to engage the projecting end of the anvil to have it position in a predetermined manner in the slot when the handle is screwed into the cap. An angularly disposed slot extends through the insulating cap and extends partway into the head for receiving the end of the welding rod in which it is clamped by the anvil when advanced in the slot as the handle is turned.

Ribs are preferably provided on the outer surface of the cap and the handle which are slotted at the base to provide openings through which heat is conducted from the terminal and head outwardly of the insulating material. This prevents the temperature of the handle and cap from rising to a prohibitive amount and eliminates the necessity of the repeated cooling of

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the handle in water which is now the common practice.

The present electrode is made up of four parts, the insulating cap, the insulating handle, the conducting head and terminal, the latter two being releasably assembled in the cap and handle, respectively, by the spring-pressed pins contained therein.

Accordingly, the main objects of the invention are: to construct a welding electrode from an insulating handle, a cap, a cable terminal and a conducting head, the latter of which is mounted in threaded relation and releasably secured to the cap and handle, respectively; to releasably mount a terminal within a handle for supporting a cable and a rotatable anvil and having a threaded end in engagement with the thread of a conducting head which is releasably supported within an insulating cap both of which contain an aperture in which an electrode is conductively retained by the anvil when the cap is rotated on the handle; to form projecting ribs on the exterior and interior surfaces of an insulating handle and cap of an electrode holder having slots extending through the walls at the base of the ribs to form heat passages through the handle and cap; to retain the conducting head and terminal of an electrode holder within an insulating cap and handle, respectively, by spring-pressed pins which project within apertures in the insulation material and relieve the pins and material from torsional strain by having interlocking ribs on the mating surfaces; and, in general, to provide a completely insulated electrode holder which is simple in construction and economical of manufacture and which is constructed of four separate parts which are releasably retained together.

Other objects and features of novelty of the invention will be specifically pointed out or will become apparent when referring, for a better understanding of the invention, to the following description taken in conjunction with the accompanying drawing, wherein:

Figure 1 is a broken view in elevation of an electrode holder embodying features of this invention;

Fig. 2 is an enlarged sectional view of the structure illustrated in Fig. 1, taken on the line 2—2 thereof;

Fig. 3 is an enlarged sectional view of the structure illustrated in Fig. 2, taken on the line 3—3 thereof;

Fig. 4 is an enlarged sectional view of the struc-

ture illustrated in Fig. 3, taken on the line 4—4 thereof; and

Fig. 5 is a sectional view of the structure illustrated in Fig. 2, taken on the line 5—5 thereof.

The electrode holder comprises a handle 10 and a cap 11 made of insulating material which has high resistance to burning. The handle contains a reduced end portion 12 which projects into the open end of the cap for completely insulating the metal parts contained therein.

The handle 10 and the cap 11 have projecting ribs 13 extending outwardly therefrom, the base of the ribs having slots 14, as illustrated more specifically in Figs. 3, 4 and 5, which extend entirely through the wall of the handle. The slots permit the heat developed within the metal parts of the cap and handle to pass through the handle, thereby preventing the temperature of the insulating material from rising to a point which would require cooling. The handle 10 insulates a conducting terminal 15 having an aperture 16 therein containing a pair of conducting shoes 17 which are clamped to the conductors 18 of a cable 19 by a set screw 21. An extending end 22 of the terminal 15 has an exterior thread 23 and an interior aperture 24.

The terminal also contains an aperture 25 in which a headed pin 26 is retained by the metal about the aperture which is peened inwardly to engage the head when urged outwardly by a spring 27. The end of the pin projects into an aperture 28 in the insulating handle and thereby locks the terminal in fixed relation to the handle. The interior of the handle 10 has inwardly projecting spaced ribs 29 between the slots 14 which extend within the spaces between ribs 31 provided on the exterior wall of the terminal 15. This relieves the pin 26 and the insulation about the aperture 26 from any torsional strain when the handle is turned relative to the cap.

The cap 11 receives the conducting head 32 having the spaced ribs 34 on its exterior surface, the space between which receives the ribs 29 projecting inwardly from the internal wall of the cap. The interior wall portion 33 adjacent to the open end of the cap is reduced in thickness to receive the reduced end 12 of the handle. The conducting head is provided with an aperture 34 containing a thread 35 which mates with the thread 23 on the extension 22 of the terminal 15. The head 32 contains an aperture 36 which may be disposed at an angle to the side thereof aligned with a similar aperture in the cap 11. An aperture 37 having parallel flat sides joins the aperture 36 with the aperture 34.

An anvil 38 having parallel flat sides, as illustrated in Fig. 3, extends into the aperture 37 and is advanced relative thereto when the head 32 is screwed upon the terminal 15. The anvil 38 has a cylindrical body 39 which extends within the aperture 24 in the extension 22 and in which it is retained by a pin 41. The pin extends through the wall of the terminal 15 to have its central portion disposed tangentially in a slot 42 provided near the base of the body 39. The end of the body 39 abuts against a washer 43 in the bottom of the aperture 24. The washer is made of copper or similar conducting material to permit the body portion to turn freely in the terminal 15 while increasing the conductivity between the two abutted surfaces.

It will be noted that the shoulder 44 in the base of the aperture 34 of the conducting head 32 is offset from the shoulder 45 on the opposite wall, which is desirable to permit the sloping

anvil end 46 to advance in the slot 37 with the face sloping in the same manner as the face 46 of the aperture 36 with which it mates. The projecting end of the anvil will pass by the shoulder 44 as the anvil is advanced within the slot 37 and will strike against the wall adjacent to the shoulder 45 and thereby have the projecting end 46 of the anvil extend ahead of the shoulder 44 of the slot.

It will thus be seen that the electrode holder is made of four parts, the handle, the cap, the terminal, and conducting head. The conducting head is releasably retained in the cap by the spring-pressed pin which projects in an aperture in the cap. The conducting terminal is retained within the handle by a similar pin projecting into a similar aperture in the handle. Both of the conducting members are retained within the handle against turning by projecting ribs which interlock with each other, which eliminates any torsional strain on the pins when the handle is turned relative to the cap. The cap is always maintained in telescoping relation with the handle and all of the metal parts of the holder are entirely insulated.

The metal parts are preferably made of an alloy of aluminum having high thermal and electric conductivity which substantially reduces the tendency to heat and reduces the weight of the holder. The entire holder weighs approximately twelve ounces, which relieves the welder from the fatigue which is experienced when working with electrode holders of greater weight. By employing insulating material in the handle and cap, which resists burning, and by providing slots therethrough at the base of exterior ribs, the handle and cap are kept cool and the life of the holder is substantially increased.

What is claimed is:

1. An electrode holder having an insulated handle and cap disposed in telescoping relation, a conducting head within the cap, a conducting terminal within the handle in threaded relation to the head, spring-pressed pins carried by the cap and terminal having locking relation with the cap and handle, and an anvil rotatably mounted on the terminal having a projecting portion provided with flat sides, said cap having an aperture with flat sides in which the anvil moves longitudinally and is retained against rotation as the cap is advanced on the handle.

2. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and external ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other, a conducting terminal having ribs nesting with the ribs on the interior of said handle, an insulating cap, and a conducting head within the cap adjustably secured on said terminal.

3. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and external ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other and being separated by slots extending through the wall of the handle, a conducting terminal having ribs nesting with the ribs on the interior of said handle, an insulating cap, and a conducting head within the cap adjustably secured on said terminal.

4. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and ex-

ternal ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other, a conducting terminal having an aperture for receiving and clamping a conductor of a cable, and spaced ribs on the exterior wall of the terminal interlocking with the ribs on the interior wall of the handle when assembled therein.

5. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and external ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other, a conducting terminal having an aperture for receiving and clamping a conductor of a cable, spaced ribs on the exterior wall of the terminal interlocking with the ribs on the interior wall of the handle when assembled therein, a spring-pressed pin extending from the wall of the terminal engageable with an aperture in the handle for locking the terminal against longitudinal movement, a threaded extension on the terminal projecting from beyond the end of the handle and containing a central aperture, an anvil having parallel sides and a circular body portion the latter of which projects in the aperture in the terminal extension, and means for retaining said body portion within the aperture while permitting it to rotate therein.

6. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and external ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other, a conducting terminal having an aperture for receiving and clamping a conductor of a cable, spaced ribs on the exterior wall of the terminal interlocking with the ribs on the interior wall of the handle when assembled therein, a spring-pressed pin extending from the wall of the terminal engageable with an aperture in the handle for locking the terminal against longitudinal movement, a threaded extension on the terminal projecting from beyond the end of the handle and containing a central aperture, an anvil having parallel sides and a circular body portion the latter of which projects in the aperture in the terminal extension, means for retaining said body portion within the aperture while permitting it to rotate therein, and a conducting washer in the bottom of the aperture engageable with the bottom end of the body portion of the anvil.

7. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and external ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other, a conducting terminal having an aperture for receiving and clamping a conductor of a cable, spaced ribs on the exterior wall of the terminal interlocking with the ribs on the interior wall of the handle when assembled therein, a spring-pressed pin extending from the wall of the terminal engageable with an aperture in the handle for locking the terminal against longitudinal movement, a threaded extension on the terminal projecting from beyond the end of the handle and containing a central aperture, an anvil having parallel sides and a circular body portion the latter of which projects in the aperture in the terminal extension, means for retaining said body portion within the aperture while permitting it to rotate therein, a conducting washer in the bottom of the aperture engageable with the bottom end of the body portion of the anvil, and a conducting head having a hollow end containing parallel sides and a thread engageable with the thread of the terminal extension and secured within the insulating cap.

8. In an electrode holder, a handle made of insulating material having a hollow interior and containing spaced projecting internal and external ribs, the base of the ribs on the interior and exterior of the handle being aligned with each other, a conducting terminal having an aperture for receiving and clamping a conductor of a cable, spaced ribs on the exterior wall of the terminal interlocking with the ribs on the interior wall of the handle when assembled therein, a spring-pressed pin extending from the wall of the terminal engageable with an aperture in the handle for locking the terminal against longitudinal movement, a threaded extension on the terminal projecting from beyond the end of the handle and containing a central aperture, an anvil having parallel sides and a circular body portion the latter of which projects in the aperture in the terminal extension, means for retaining said body portion within the aperture while permitting it to rotate therein, a conducting washer in the bottom of the aperture engageable with the bottom end of the body portion of the anvil, a conducting head having a hollow end containing a thread engageable with the thread of the terminal extension and secured within the insulating cap, said conducting head and cap having an aperture extending therein through the side wall of the cap, and an aperture having parallel sides connecting the first said aperture to the hollow end of the cap.

9. In an electrode holder, a handle containing a cable terminal having a threaded projecting end containing an aperture, an anvil having parallel sides and a cylindrical body portion which extends within the aperture and is retained therein against longitudinal displacement, an insulating cap, a conducting head within the insulating cap having a flat-sided aperture joining with an aperture which extends through the side wall of the head and cap for receiving the end of a welding rod, one of said flat sides being shorter than the other, the end of the anvil being sloping so as to have the longer side engage the projecting end of the anvil and thereby have the anvil advance in the parallel-sided slot with the projecting end in a desired position.

RUSSEL A. WELCH.

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