Feb. 15, 1927. 1,617,354

DE ELBERT A. REYNOLDS

ELECTRIC WELDING TOOL

Filed Feb. 19, 1925

Fig. 1.

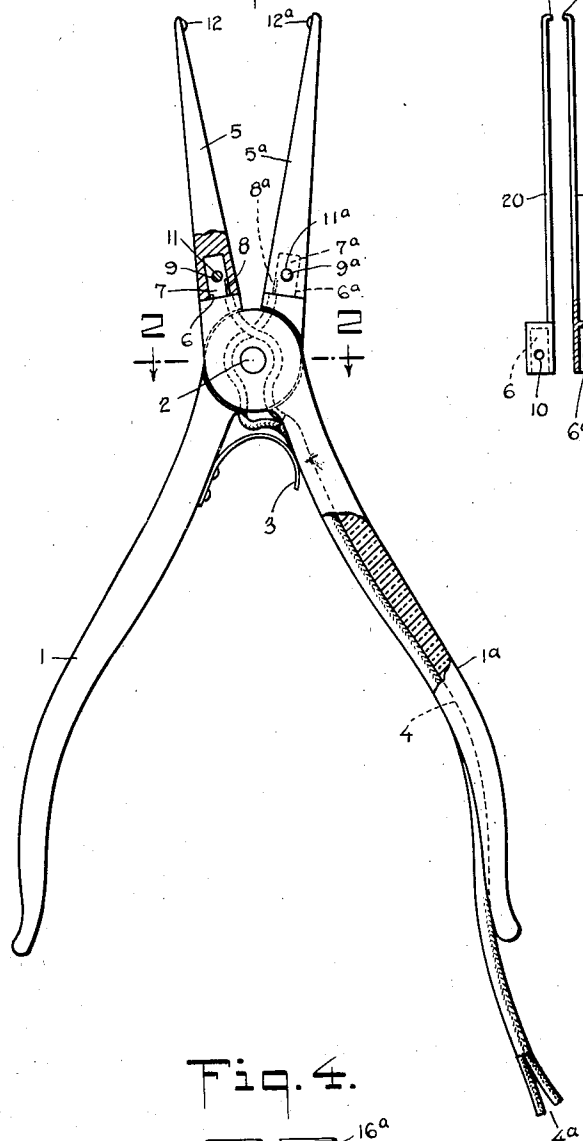


Fig. 5.

Fig. 3.

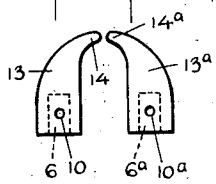


Fig. 4.

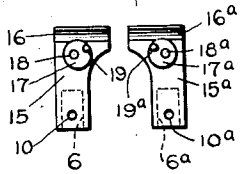
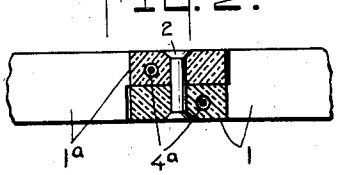


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC-WELDING TOOL.

Application filed February 19, 1925. Serial No. 10,165.

This invention pertains to certain new and useful improvements in portable electric welding tools.

An object of this invention is to provide a simple, cheap and effective device for electrical welding, where the electrical current may be directly conveyed to the parts to be welded without danger to the operator while simultaneously handling the parts to perform the desired mechanical operations. This device is of special importance in the manufacture of small articles such as radio receiving sets and the like.

In one form of my invention, I prefer to make the device in the form of a pair of pliers constructed of fiber, condensite or other non-electrically conducting material, the outer ends of the pliers being distended, and upon which are respectively fitted metal jaws of desired varied form to adapt the device to the particular character of work to be performed. These jaws are respectively provided with suitable contact points, and means are provided for removable attachment to the body of non-electrically conducting material of the pliers. The electrical terminals are preferably concealed within the jaws, or so placed or inserted as to locate the insulated cord of the electrical wires against one of the handles of the pliers, or carried in the hollow arm in a groove of one of the handles.

Further features and objects of the invention will be more fully understood from the following detail description and the accompanying drawings, in which—

Fig. 1 is a plan view of one form of my invention;

Figs. 2, 3, 4 and 5 are detail plan views of different forms of jaws for attachment to the plier form of my invention.

Referring to the drawings, 1 and 1ª represent the handles of a pair of plier members of non-electrically conducting material, which are hinged at 2 in the usual manner as in the ordinary pair of pliers of metallic construction, and normally held in a distended condition by the spring 3. One handle 1ª of the pliers is preferably grooved in its inner face 4, to receive the cord of insulated wires 4ª, conveying the electrical current from any suitable source of electrical supply. One form of jaws 6 and 6ª are shown in Fig. 1 and each jaw 5, 5ª is provided at its inner end with a recess 6, or 6ª snugly receiving one of the projections 7, 7ª at the forward ends of the non-electrically conducting handles 1, 1ª. The exposed wire terminals 8, 8ª are filled in the faces of the projections 7, 7ª of the set of the shorter juxtaposed ends of the plier members to electrically contact with the respective jaws 5, 5ª by frictional engagement. The openings 9 and 9ª are provided in the projections 7, 7ª respectively registering with similar openings 10, 10ª in the jaws 5, 5ª for receiving the locking pins 11, 11ª respectively.

The jaws 5, 5ª are preferably provided with the special contact points 12, 12ª usually located adjacent the extremities of the inner faces of the jaws 5, 5ª to attain a localized mechanical engagement with the parts, grasped by the jaws 5, 5ª and simultaneously a localized electrical contact therewith.

In Fig. 3, I have illstrated another form of plier jaws 13, 13ª which are shaped with converging, reduced forward ends 14, 14ª for simultaneous mechanical and electrical engagement without the provision of special electrical contacts. The rearward ends are provided with the recesses 6, 6ª similarly as above described for receiving the projections 7, 7ª of the plier handles 1, 1ª, and openings 10, 10ª for the locking pins 11, 11ª.

Fig. 4 shows another form of jaws 15, 15ª of relatively sharp and blunt shape and bent at their forward ends 16, 16ª toward one another, similarly as in the construction of Fig. 3.

The form of jaws shown in Fig. 4 is particularly adapted for holding a pair of wires to be welded or soldered to one another and for such purpose I provide the grooves 16, 16ª respectively adjacent the extremities of the jaws 15, 15ª and cam locking members 17, 17ª, respectively eccentrically pivoted at 18, 18ª and provided with the manipulating projections 19, 19ª, whereby each wire may be locked within a groove of the jaws.

Fig. 5 illustrates a form of spider plier jaws 20, 20ª which are bent convergingly at their ends 21, 21ª.

From the above, it will be perceived that my form of pliers is adapted for many forms of operations of simultaneous mechanical handling and electrical soldering or welding by a single operation and if desired solely by the use of one hand of the operator, and at all times the operator is protected from the physical contact with the electrical parts.

The provision of locating both electrical conductors or the cord of the two conductors in one handle only of the pliers enables the operator to grasp the pliers and to suspend the electrical cord out of the range of his movements in the operation.

If desired, a cut-off switch or disconnecting plug may be located in the cord 4^a adjacent the end of the handle 1^a, to facilitate cutting off the electrical current when changing the form of jaws and also when the pliers are laid down idly or stored.

The jaws may be secured to the pliers by frictional fit, in which circumstance each recess 6, 6^a is preferably of wedge form, the wedge converging in the direction toward the inner face of the jaw to thereby attain maximum frictional contact when pressure is applied to the handles against the work.

In the use of my invention, it is only necessary to bring the parts to be electrically welded together between the contact points 12, 12^a on the converging ends of the respective jaws under a slight pressure in order to heat the parts while simultaneously fusing the solder applied thereto or to sufficiently fuse the metal parts adjacent the points of engagement to autogenously weld the parts to one another. My invention also protects the operator from the effect of the heat developed in the soldering or welding operation by reason of the heat insulation afforded by my pliers or frame.

Whereas I have described my invention by reference to specific forms thereof it will be understood that many changes and modifications may be made without departing from the spirit of the invention.

I claim:

1. In welding pliers, a pair of plier members including handles having exterior surfaces wholly of electrically non-conducting material, means for pivotally connecting said plier members to one another intermediate their ends, a pair of insulated electrical conductors carried by said handles, the ends of said electrical conductors being exposed and positioned at one set of the juxtaposed ends of said plier members respectively, and a pair of jaws of electrically conducting material secured respectively to said juxtaposed ends of said plier members and respectively in contact with said exposed ends of the electrical conductors.

2. In welding pliers, a pair of plier members including handles having exterior surfaces wholly of electrically non-conducting material, means for pivotally connecting said plier members to one another intermediate their ends, a pair of insulated electrical conductors carried by said handles, the ends of said electrical conductors being exposed and positioned at one set of the juxtaposed ends of said plier members respectively, a pair of jaws of electrically conducting material and means for removably securing said jaws respectively to said juxtaposed ends of the plier members and in contact with said exposed ends of the electrical conductors respectively.

3. In welding pliers, a pair of plier members including handles having exterior surfaces wholly of electrically non-conducting material, means for pivotally connecting said plier members to one another intermediate their ends, a pair of insulated electrical conductors carried by one of said handles, the ends of said electrical conductors being exposed and positioned at one set of the juxtaposed ends of said plier members respectively, and a pair of jaws of electrically conducting material secured respectively to said juxtaposed ends of said plier members and respectively in contact with said exposed ends of the electrical conductors.

4. In welding pliers, a pair of plier members including handles having exterior surfaces wholly of electrically non-conducting material, means for pivotally connecting said plier members to one another intermediate their ends, a pair of insulated electrical conductors carried by said handles, the ends of said electrical conductors being exposed and positioned at one set of the juxtaposed ends of said plier members respectively, an expansive spring interposed between and engaging said handles and a pair of jaws of electrically conducting material secured respectively to said juxtaposed ends of said plier members and respectively in contact with said exposed ends of the electrical conductors.

In testimony whereof I have signed this specification this 11th day of February, 1925.

DE ELBERT A. REYNOLDS.