

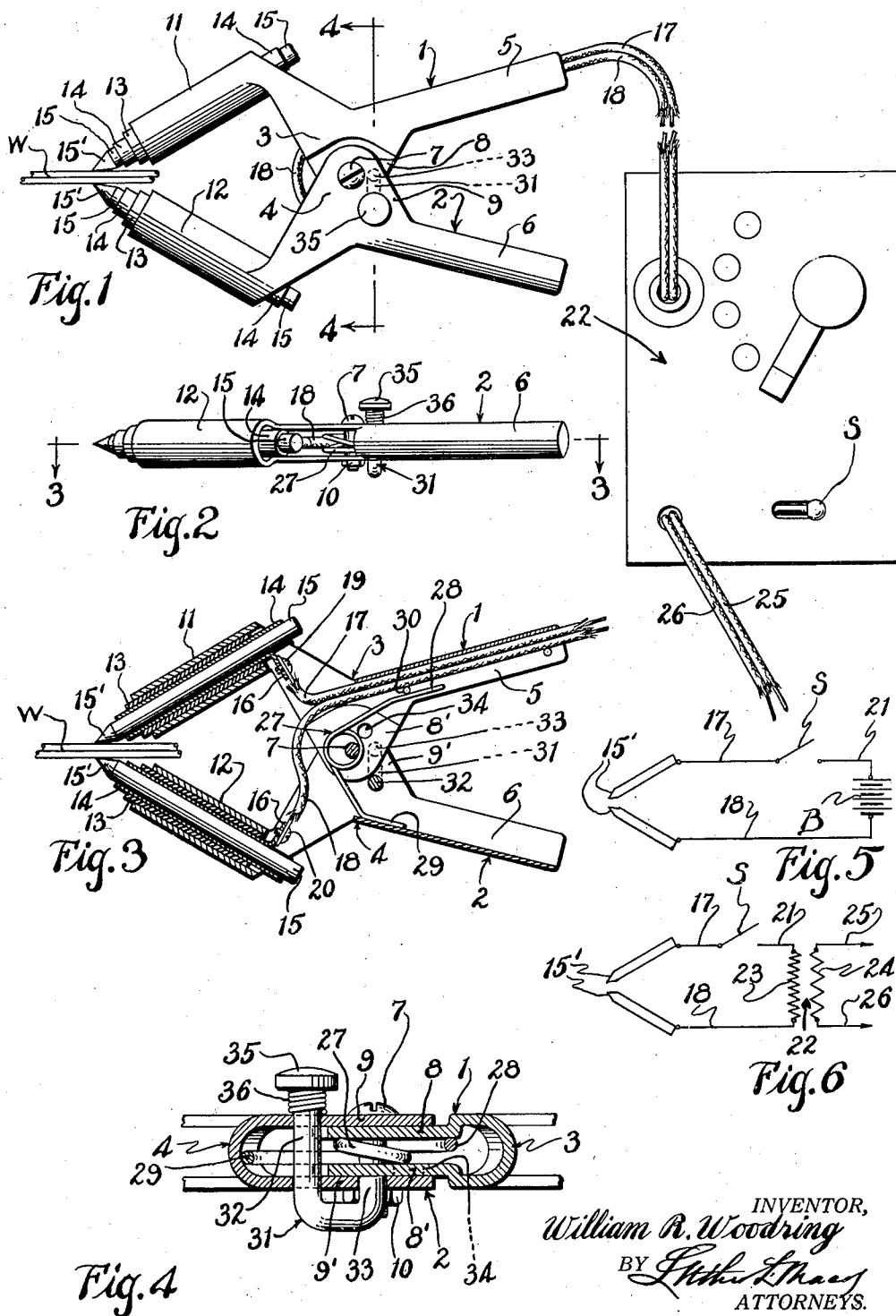
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ELECTRICAL SOLDERING APPARATUS

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ELECTRICAL SOLDERING APPARATUS

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This invention relates to electrical soldering apparatus, and an object is to provide a simple, compact and effective instrument of portable character and of light weight so that it may be held in the hand of an operator for soldering parts or pieces of metal together.

This invention comprehends the use of an instrument arranged to operatively support a pair of electrodes both in and out of contact with each other whereby the instrument may be operative and inoperative at will, together with means for connecting the electrodes with a source of low voltage electric current, either stepped down from an ordinary lighting circuit or connected in the circuit of a storage battery, as may be found convenient or desirable.

A more detailed object of invention is to provide a soldering instrument embodying a pair of hingedly connected levers, each of which is arranged to support an electrode, preferably of carbon, and including means for insulating the electrodes from the levers, means for resiliently connecting the levers whereby the electrodes may be urged into contact with each other, and means for locking the levers into opened position with the electrodes spaced apart for maintaining a normally open circuit.

Other objects may appear as the description progresses.

As shown in its preferred form, my invention is illustrated in the accompanying drawing, in which

Fig. 1 is a plan view of an electric soldering instrument embodying my improvements and shown electrically connected with a variable transformer in an ordinary lighting or power circuit.

Fig. 2 is a side elevation of the instrument proper.

Fig. 3 is a sectional plan of the instrument on line 3—3 of Fig. 2.

Fig. 4 is a transverse section of the same on line 4—4 of Fig. 1.

Figs. 5 and 6 are, respectively, circuit diagrams showing the electrodes electrically connected with a battery and with a transformer in a power circuit.

The essence of the invention is in the in-

strument by means of which the soldering operations are accomplished. The instrument embodies a pair of levers 1 and 2 provided with central U-shaped body portions 3 and 4 respectively, and handles 5 and 6 extended from one side of a hinge pin 7 by means of which said levers are pivotally secured together.

Preferably the body portions 3 and 4 have parallel spaced webs 8 and 8' and 9 and 9', respectively, which overlap, as shown in Fig. 4, and thru which the hinge pin or screw 7 is extended and held by means of a nut 10. The handles 5 and 6 are preferably circular in cross section, as shown, in order to provide convenience and comfort in holding the instrument during a soldering operation.

On the opposite side of the screw 7 from the handles 5 and 6 the levers 1 and 2 are provided with elongated tubular portions 11 and 12 respectively, which have bushings as at 13 suitably held therein. In each of said bushings 13 I provide a frictionally held sleeve 14 preferably of copper, within which is frictionally held a carbon electrode 15. The sleeves 14, 14 are provided with lugs 16, 16, which are inwardly bent over the inner ends of the bushings 13, and are connected respectively with conductors 17 and 18 by means of terminal screws 19 and 20.

The conductors 17 and 18 may be connected in the circuit of a battery, as shown in Fig. 5, or with a transformer, as shown in Figs. 1 and 6. In either case a suitable switch S is incorporated in the circuit of the electrodes 15, 15 and connected with one of the conductors, as at 17 for instance.

When a battery, as at B, is employed for supplying the electric current to the electrodes, the switch S may be connected with the battery by means of a conductor 21, while the wire 18 from the other electrode is connected with the opposite side of the battery.

When a transformer is employed, as at 22, the wires 18 and 21 are connected with the secondary winding 23 of the transformer, as shown in Fig. 6, and the primary winding 24 is connected with lead-in wires 25 and 26 respectively, arranged for connection with a lighting or power circuit.

The electrodes 15, 15 are normally urged in the direction of each other by means of a spring 27, which is preferably coiled around the hinge screw 7 and has end portions 28 and 29 extended outwardly into the handles 5 and 6 respectively with the portion 29 engaging the hollow handle 6 and the portion 28 resting against a pin 30 carried in handle 5, or otherwise suitably arranged for tensioning the lever. It will be obvious that the tension of the spring 27 normally urges the handles 5 and 6 apart and correspondingly urges the electrodes 15, 15 into contact. The circuit is completed by the contact of the electrodes 15, 15 with each other, or by the contact of said electrodes with the work, as at W, to be soldered.

I provide means for normally holding the levers 1 and 2 in opened positions and for maintaining an open circuit of the electrodes. Such means is shown in the drawing and includes a locking device 31 which has a main stem 32 slidably held in the body 4 of the member 2 and is bent into U form at its lower extremity and provided with an upwardly extending leg 33 which extends thru an aperture in the lower web 9' of lever 2 and is arranged to be extended thru an aperture 34 in the lower web 8' of lever 1.

The stem 32 of member 31 has a head 35 on the upper end thereof between which and the web 9 of lever 2 a spring 36 is held in compression. Thus the spring 36 normally tends to hold the portion 33 in frictional engagement with the lower side of the web 8' of lever 1, as shown in Fig. 4, and when the handles 5 and 6 are compressed and moved in the direction of each other until the aperture 34 is aligned with the portion 33 of member 31, said portion will seat in the aperture and hold the levers 1 and 2 in opened position.

In order to close the circuit by moving the electrodes 15, 15 into contact with each other or with the work W, pressure is applied to the head 35 of member 31 thereby depressing the locking member and disengaging the portion 33 thereof from the aperture 34 of member 1 against the tensioning of spring 36, whereupon the spring 27 is effective for urging the electrodes into contact with each other or with the work.

In operation, when the instrument is connected in the circuit of a battery, as shown in Fig. 5, or together with a transformer in an ordinary lighting or power circuit, as shown in Fig. 6, and the switch S is closed, the instrument will be in readiness for instant use. Normally the levers 1 and 2 are locked together in opened position by means of the locking member 31 so as to normally maintain an open circuit of the electrodes.

The instrument is held in the hand of an operator after the fashion of a pair of scissors or pliers. The work is then held in the

other hand or in a suitable support, the usual flux is applied to the work, and the solder is positioned over the work, whereupon the member 31 is depressed for unlocking the levers, thus permitting the movement of the electrodes 15, 15 into contact with opposite sides of the work. The work thus completes the circuit of the electrodes and the tapered points of the electrodes are instantaneously heated to a sufficient extent to fuse the solder, after which by squeezing the handles together the instrument may be removed from the work and the operation may be completed.

It will be apparent that the instrument which I have shown and described is advantageous and economical in performing difficult, tedious and delicate soldering operations which are ordinarily done with soldering irons. The conical points of the electrodes are capable of being inserted in obscure places where ordinary soldering irons cannot usually be employed.

Because of the fact that sufficient heat is always instantaneously available by merely permitting the electrodes to move into contact with the work, soldering operations are more quickly and more perfectly done than with cumbersome irons heretofore used, and no time is wasted in heating the irons.

It will be observed that the electrodes 15 are completely insulated from the levers 1 and 2 by means of the insulating bushings 13, and that the electrode holders 11 and 12 which are formed integral with the levers 1 and 2 respectively are diagonally disposed at corresponding angles from a longitudinal line cutting the axis of the hinge screw 7, as shown in Fig. 1, so that the conical points 15', 15' of the electrodes may be moved together or into contact with the work W for closing the circuit.

Preferably the electrodes 15 are frictionally held in their sleeves 14 so that they may be advanced to the left as seen in Fig. 1, as the points 15' thereof are deformed or worn away from use.

Any other suitable means than the means shown may be employed for adjustably mounting the electrodes 15 in the holder.

I deem it possible to otherwise modify the form of device described herein within the scope of the appended claims, without departing from the spirit of my invention.

What I claim is:

1. An electrical soldering instrument comprising a pair of levers hingedly connected together, and including means for opening and closing the levers, a pair of electrodes oppositely mounted on said levers and having conductors leading therefrom for connection with a source of electric current, the circuit of said electrodes being closed by moving the electrodes together or in contact with the work adapted to be inserted therebetween

and means for locking said levers in open position for normally maintaining an open circuit of the electrodes.

5 2. An electrical soldering instrument comprising a pair of levers hinged together, a pair of electrodes oppositely mounted on said levers and having conductors leading therefrom for connection with a source of electric current, the circuit including said electrodes being closed by moving the electrodes together or in contact with the work adapted to be inserted therebetween, and a spring locking device mounted on one of said levers for frictionally engaging the other lever and
15 yieldingly resisting relative swinging movement of said levers, said other lever having an opening to receive said locking device for locking said levers in position with said electrodes spread apart.

20 3. An electrical soldering instrument comprising a pair of levers hinged together, a pair of electrodes oppositely mounted on said levers and having conductors leading therefrom for connection with a source of electric
25 current, the circuit including said electrodes being closed by moving the electrodes together or in contact with the work adapted to be inserted therebetween, means for resiliently connecting said levers whereby the
30 same are normally urged into closing position, and means for locking said levers in open position for normally maintaining an open circuit of said electrodes.

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