Feb. 14, 1933. I. E. COLE ET AL 1,897,606

HAND WELDING MACHINE

Filed Aug. 27, 1930

FIG. 1

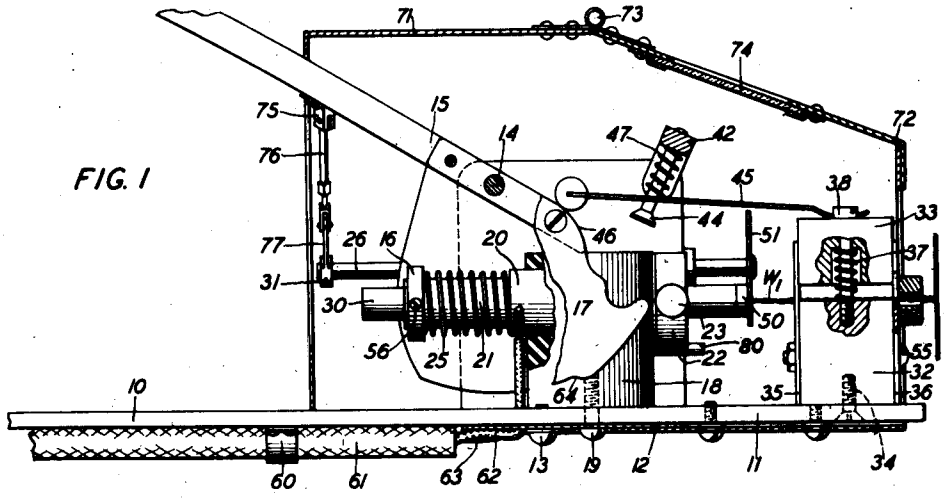


FIG. 2

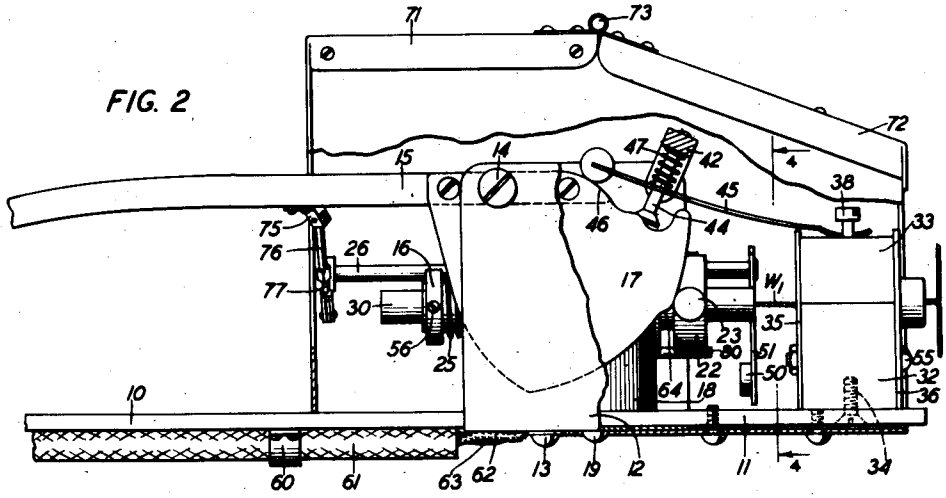


FIG. 4

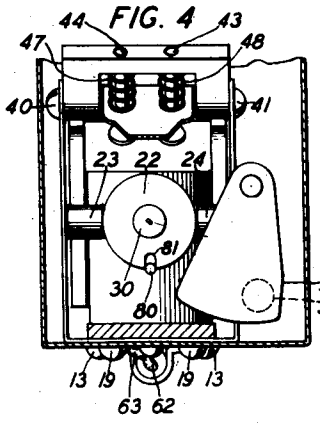
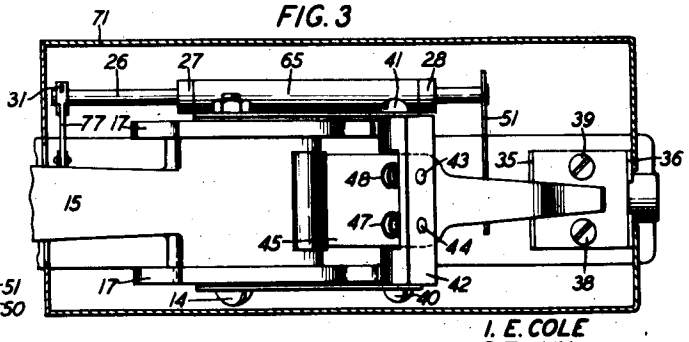


FIG. 3



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UNITED STATES PATENT OFFICE

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HAND WELDING MACHINE

Application filed August 27, 1930. Serial No. 478,072.

This invention relates to welding machines.

It is an object of this invention to provide a hand or manually operated machine of this character which will be simple, cheap to manufacture, efficient in operation, light in weight and which can be operated from a small portable source of power.

According to this invention a stationary handle lever carries a plate which is provided for mounting jaw members between which the wires to be welded are held in place during the welding operation. One of the jaw members is actuated through the action of a leaf spring which is tensioned by the movement of a cooperating handle lever. On the plate is secured a block of insulating material in which a sleeve which carries a carbon electrode is mounted for movement upon the operation of the operable handle lever. A stop which normally extends in spaced relation with respect to the jaw members and in juxtaposition to the end of the carbon electrode is provided for assisting in placing wires in adjusted position between the jaw members. A mechanism operated by the movable handle is provided for moving the stop away from the path of the carbon electrode in order to permit the contact of this electrode with the wires which form the other electrode. Such contact is effected by the continued movement of the movable handle, and springs are provided for returning the electrode and the operating parts to normal upon the release of the movable handle, a housing being provided for enclosing the operating parts and for protecting the operator from the arc.

Reference being had to the accompanying drawing in which Fig. 1 is a side assembly view showing the housing and a number of operating parts in section. Fig. 2 is another side view showing the actuating handle in the operated position and the casing partially cut away. Fig. 3 is a top view and Fig. 4 is a cross sectional view taken approximately on line 4—4 of Fig. 2.

In Figs. 1 and 2, 10 indicates a stationary handle which is formed integrally with a base plate 11. Straddling this plate is a U shaped bracket 12 which is held securely thereon by a number of screws such as 13. On bracket 12 there is mounted a long screw or rod 14 on which the handle lever 15 is pivotally mounted. This handle lever carries at its inner end a duplex camming member 17 provided for a purpose that will be hereinafter described in detail. On the plate 11 and in position between the upward extending portions of the U shaped bracket 12 there is mounted an insulating block 18 which is secured thereon by a number of screws such as 19 shown in Figs. 1 and 2. In this block is securely mounted a metallic bushing 20 in which a sleeve 21 is slidably mounted. This sleeve is provided at its front end with a collar 22 having at its periphery two radially disposed rollers 23 and 24 arranged for engagement with the duplex camming member 17. On the other end of sleeve 21 there is mounted a collar 16 which serves as an abutment for the spring 25 at this end. This collar is held in place by a screw 56 which protrudes through the sleeve 21 for securing a carbon electrode 30 in adjusted position with respect to a stop member 51. The other end of this spring bears against the end of bushing 20 and is provided for resiliently holding the sleeve 21 and the carbon electrode carried thereby in their retracted position as shown in Fig. 1. In the block 18 is mounted a pin 80 shown in Fig. 4 which extends laterally therefrom in engagement with a slot 81 at the periphery of collar 22 for holding it and the carbon electrode 30 carried thereby against rotary movement under the action of cam 17, this cam being provided with a recess 64 to permit a small return movement of the electrode 30 upon its contacts with the wire joint W_1 for a purpose that will be hereinafter described in detail.

To one side of the U shaped bracket 12, there is attached as by welding a bushing 65 in which a rod 26 is mounted and held against axial movement therein by collars 27 and 28. This rod carries at one end the sector shaped stop member 51 having an abutting piece 50 of carbon material which normally rests in coaxial alignment with the effective end of the carbon electrode 30 and in juxtaposition

therewith for a purpose that will be hereinafter described in detail.

The rod 26 is operatively connected with the handle lever 15 by the link members 75, 76 and the lever 77, the latter being secured to the rod 26 by pin 31.

On the front end of plate 11 as shown in Figs. 1, 2 and 3, there is mounted a pair of jaw members 32 and 33, between which the joint W_1, the end of which is to be welded, is held in place during the welding operation. The jaw member 32 is secured on the plate 11 by a number of screws such as 34 and to this jaw are attached as by screw 55, the plates 35 and 36 which are provided for guiding the jaw member 33 when actuated by the movement of the lever handle 15.

The jaw member 33 is resiliently held in the open position against the head of screws 38 and 39 by a number of coiled springs such as 37 shown in Fig. 1.

To the top of the U shaped bracket 12 there is attached as by screws 40 and 41, a yoke member 42 which carries the studs 43 and 44 provided for holding a leaf spring member 45 in adjusted position with respect to a cam portion 46 at the end of handle lever 15 and the movable jaw member 33. A pair of coiled springs 47 and 48 are interposed between the yoke 42 and the leaf spring 45 to prevent too great deformation of the leaf spring under the action of handle lever 15 when it is moved in the operated position as shown in Fig. 2, these springs being also effective to return the handle lever 15 to normal position as shown in Fig. 1 upon its release by the operator.

To the plate 11 is attached as by clamp 60 a lead-in cable 61. The wire 62 of cable 61 is attached as by soldering to the sleeve 20, as shown in Fig. 1 which, with the sleeve 21, forms part of the operating circuit. The wire 63 of cable 61 is attached to the plate 11 by one of the screws 13, holding the bracket 12 to plate 11, this plate and the jaw members 32 and 33 and the wire joint clamped therebetween forming the return circuit.

On the plate 11 is attached a sheet metal housing 71 which is provided with a door 72. This door is hinged on a pivot 73 and is provided with a colored glass 74 for protecting the operator from the arc and to permit visual observation of the working operation, the door permitting free access for the adjustment of the operating parts and repairs.

In a typical example of operation, with the handle lever 15 in position as shown in Fig. 1, the carbon electrode is adjusted to bear against the piece 50 carried by stop 51 where it is secured by the screw 56 in collar 16. The wire joint to be welded is then placed between the open jaw members 32 and 33 with the end of the joint W_1 engaging the front surface of this stop thus placing the carbon electrode and the joint in proper spaced relation to each other. A small angular movement of handle lever 15 and the cam portion 46 carried thereby is effective to tension the leaf spring 45 against the resistance of coiled springs 47 and 48 mounted on the yoke member 42. The tension of the leaf spring is effective to operate the jaw member 33 against the resistance of springs 37 for holding the joint firmly in place between the jaw members 32 and 33. The continued movement of handle lever 15 toward its operated position shown in Fig. 2 is effective to rotate the stop 51 away from the path of the electrode 30 and to move this electrode in contact with the end of the joint through its connection with the cam 17 thus completing an electrical circuit between the electrode and the wire joint. But it is to be noted that the duplex cam 17 has a recessed portion 64 which permits a sufficiently small return movement of the carbon electrode under the tension of spring 25 in order to draw the arc between the carbon and the joint which forms the other electrode thus causing the weld to be effected at the end of the joint. Upon the release of handle lever 15, the electrode 30 is returned to normal through the tension of spring 25, thus extinguishing the arc. Similarly, the movable jaw member is returned to normal through the medium of retracting spring 37, the stop 51 being returned to normal position upon the movement of handle lever 15 through its connection with the links 75, 76 and lever 77 which thus places the machine ready for a subsequent operation.

The machine of this invention was developed for welding spliced conductors in telephone toll cables instead of soldering them since solder sometimes left sharp points which tend to puncture the protecting cotton sleeve; occasionally cases are encountered where it is difficult to make the solder "wet" the copper of the conductor; the obtaining of room for the furnace for heating the iron is sometimes difficult; and rosin flux of the solder is objectionable to the workmen. These objections are eliminated by welding the end of the splices.

What is claimed is:

1. In a welding machine, a support, a handle lever arranged for movement thereon, a pair of jaw members carried by said support, one of said jaws being movable, guiding means for said movable jaw, an electrode, a yieldable device operatively connecting said movable handle to said movable jaw for closing it, a stop for positioning the parts to be welded in adjusted position with respect to said electrode and means carried by said handle lever for moving said electrode in contacting relation with the parts to be welded for effecting the weld.

2. In a hand welding machine, a pair of

handles, an electrode actuated by the movement of one of said handles, a stop normally in the path of said electrode for positioning the object to be welded and a mechanism for actuating said stop upon the movement of the movable handle to permit the engagement of said electrode with the object.

3. In a welding machine, a support, a handle, a movable electrode mounted on said support, a caming mechanism operatively connecting said handle to said electrode, a normally ineffective clamping device mounted on said support, and a spring tensioned by the movement of said handle to render said device effective for securing an object, the movement of said handle being simultaneously effective to engage said electrode with the object in said device.

4. In a welding machine, a mounting plate, a movable handle mounted on said plate, an electrode mounted on said plate, a mechanism operable upon the movement of said movable handle for securing the object to be welded in engageable relation with said electrode, a caming device carried by said movable handle for imparting movement to said electrode, said device first causing the electrode to engage with the object and then permitting a small return movement of said electrode to draw an arc between it and the object to cause the weld to be formed.

In witness whereof, we hereunto subscribe our names this 26 day of August, 1930.

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