W. E. SYMONS.

ELECTRIC WELDING TOOL.

APPLICATION FILED MAY 22, 1917.

1,240,901.

Patented Sept. 25, 1917.

2 SHEETS—SHEET 1.

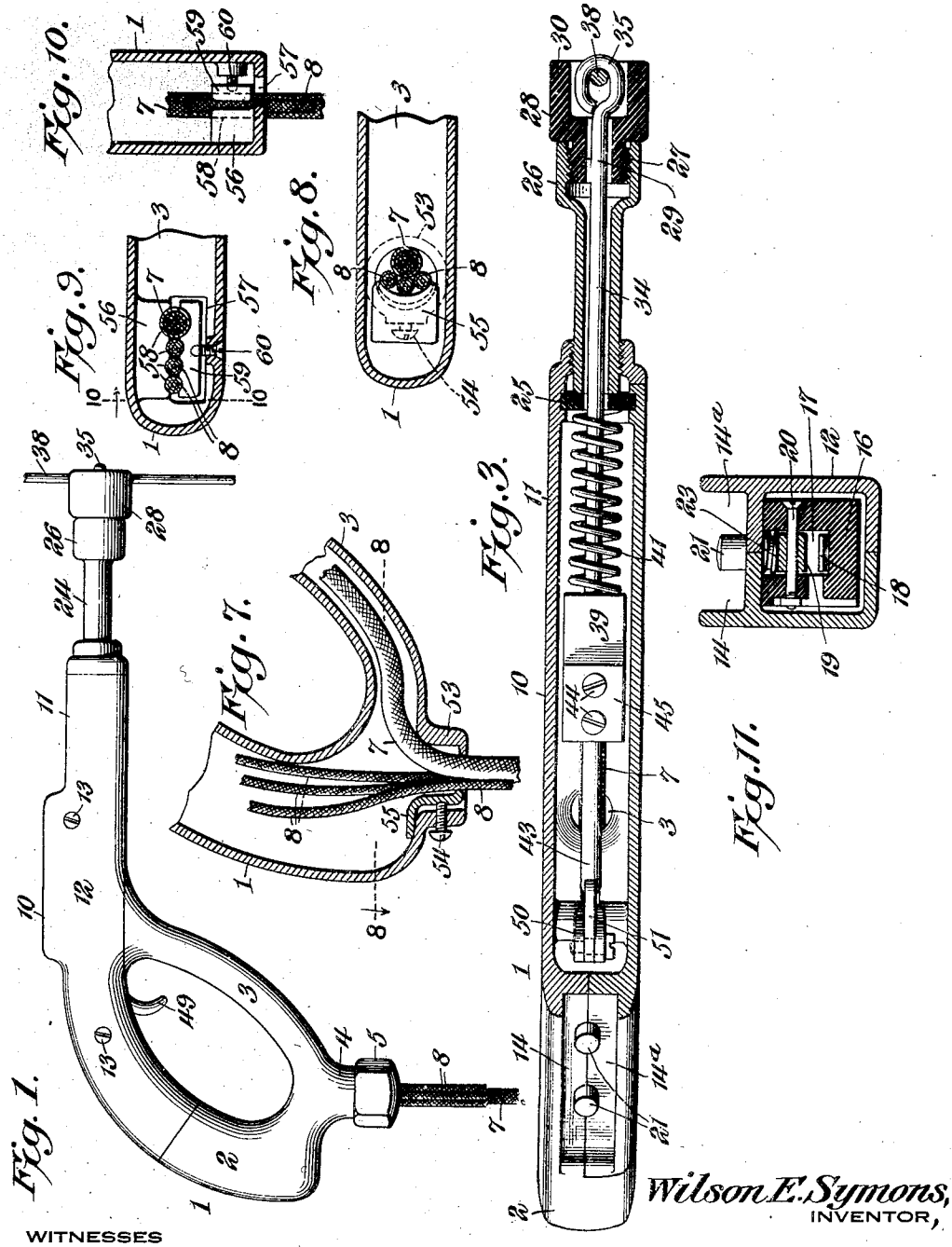


Fig. 1.

Fig. 10.

Fig. 9.

Fig. 8.

Fig. 7.

Fig. 3.

Fig. 11.

WITNESSES

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F. T. Chapman.

Wilson E. Symons,

INVENTOR,

BY E. G. Siggers

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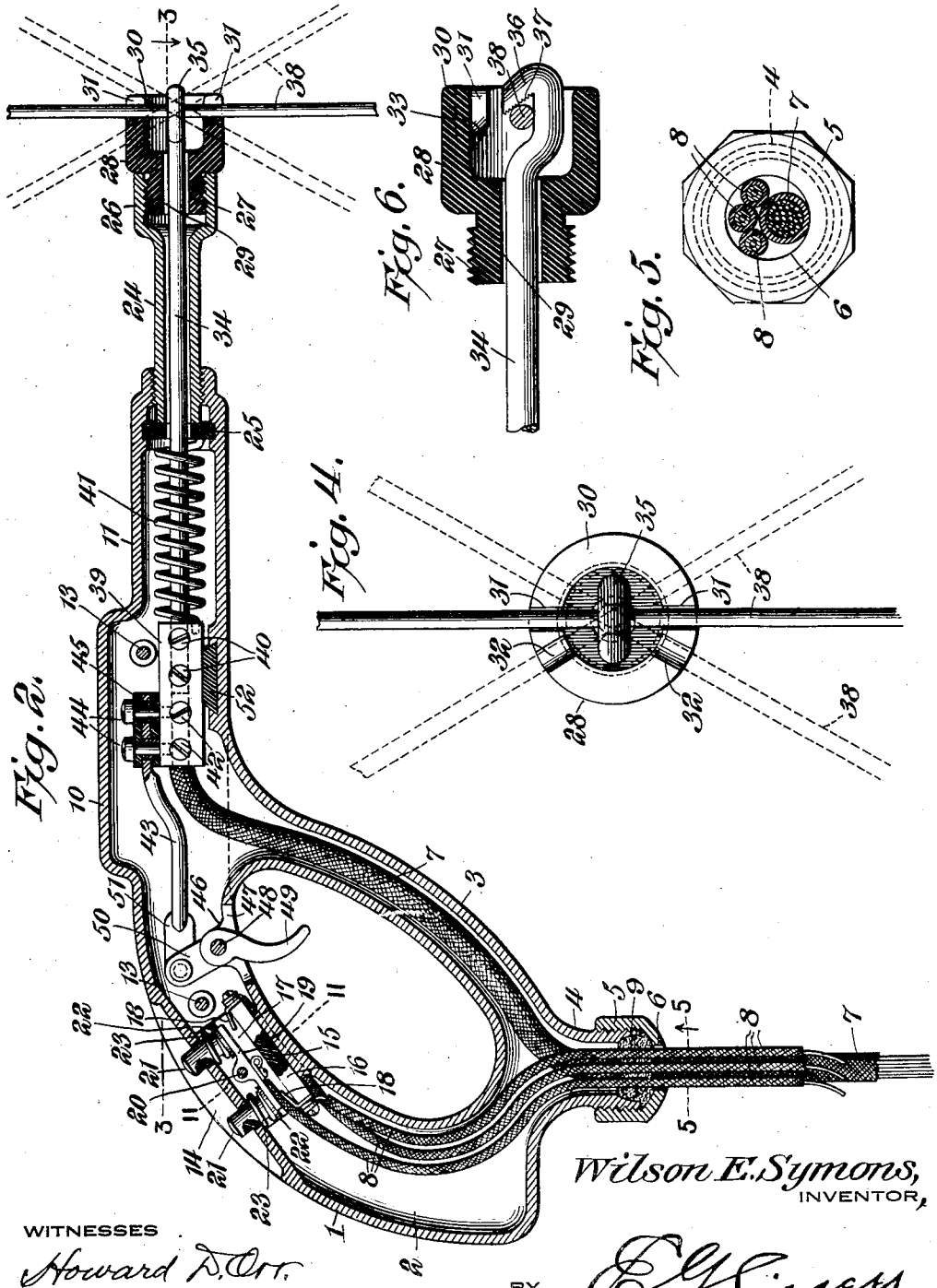


Fig. 2.

Fig. 6.

Fig. 5.

Fig. 4.

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UNITED STATES PATENT OFFICE.

WILSON E. SYMONS, OF NEW YORK, N. Y.

ELECTRIC WELDING-TOOL.

1,240,901. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed May 22, 1917. Serial No. 170,221.

To all whom it may concern:

Be it known that I, WILSON E. SYMONS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Electric Welding-Tool, of which the following is a specification.

This invention has reference to electric welding tools for use in connection with arc welding, and its object is to provide a tool for the purpose of convenient form for handling and provided with means within convenient reach of the operator for distant control, and also provided with means for the ready placing of the tool-carried electrode in different positions with reference to the tool itself.

In accordance with the invention the electrode holder has a pistol-grip handle of hollow construction in which the terminal portions of electric conductors may be conveniently housed, with the pistol-grip portion of the tool provided with an electric switch so arranged as to be manipulated by the hand grasping the tool without the necessity of loosening the grip of the hand on the tool. Furthermore, the invention comprises means for setting the electrode into different angular relations to the body of the tool and firmly holding it in such relations, thus contributing materially to the scope of use of the tool.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming part of this specification, with the further understanding that while the drawings show a practical form of the invention, the latter is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications come within the scope of the appended claims.

In the drawings:—

Figure 1 is a side elevation of an electric welding tool embodying the invention.

Fig. 2 is a longitudinal section of the tool shown in Fig. 1, but drawn on a larger scale.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is an elevation of the electrode holding end of the tool, distant parts being omitted.

Fig. 5 is a section on the line 5—5 of Fig. 2, distant parts being omitted, and the figure being drawn on a larger scale than Fig. 2.

Fig. 6 is a longitudinal section of the electrode holding end of the tool on the scale of Fig. 4, but showing a different form of electrode clamp.

Fig. 7 is a view of the conductor entering end of the hand hold of the tool showing a different construction from that shown in the other figures.

Fig. 8 is a section on the line 8—8 of Fig. 7.

Fig. 9 is a view similar to Fig. 8 but showing a somewhat different form of conductor clamp.

Fig. 10 is a section on the line 10—10 of Fig. 9.

Fig. 11 is a section on the line 11—11 of Fig. 2.

Referring to the drawings there is shown a hollow casting 1 formed of two members 2, 3, respectively, united at one end, and there merging into a neck 4 externally screw-threaded and provided with a screw cap 5 having an opening 6 for the passage of conductors 7, 8, respectively. The cap 5 is provided with packing 9 for firmly holding the conductors, one of which, the conductor 7, is a large conductor for carrying heavy currents, and the other conductors 8 are smaller conductors, since their purpose is merely to carry current for distant control, as will hereinafter appear. The two branches 2 and 3 join at the end remote from the neck 4 in a body portion 10, which in turn is continued in the form of a barrel, the whole structure being somewhat similar in appearance to a pistol and the hollow branch 2 having a relation to the body member 10 and barrel 11 of the hand-hold of a pistol to the barrel of the pistol, so that the branch 2 is in effect a pistol grip, which greatly facilitates the control of the tool in use and permits handling of it without fatigue to the hand of the operator besides permitting the electric conductors to be located in such manner as to avoid undue bending of these conductors while the tool is in use.

In order to permit access to the interior of the tool, one side is in the form of a removable section or plate 12 held to the remainder of the tool by screws 13 or otherwise. At one point in the branch or grip portion 2 there is an exterior depression 14, while the removable section 12 has a matching depression 14ª. Within the branch 2 beneath the depression 14 and 14ª is a thickened part 15 on which is lodged a support 16 which may be made of insulating material, and which is provided with a channel 17. At the ends of the channel there are secured contact members 18 to which two of the conductors 8 are connected. In the channel there is mounted a rock member 19 upon a bolt or other support 20 and having its ends in such relation to the contacts 18 as to engage one or the other as the member 19 is rocked. Buttons 21 of insulating material provided with heads 22 extend through suitable passages in the bottom of the depressed portions 14, 14ª and engage the rock member 19. Springs 23 on the buttons 21 serve to hold the rock member in a neutral position out of contact with each of the members 18. The third one of the conductors 8 is connected to the rock member 19 and may be considered as the return conductor, the other two conductors 8, as well as the return conductor, being carried to a distant point of control, so that when one button 21 is depressed, a certain current is fed to the conductor 7 and when the other button 21 is depressed another current is fed to the conductor 7, whereby the welding current is correspondingly buried. By housing the buttons 21 in a depression in the branch 2 constituting the pistol grip of the tool they are within easy reach of the thumb or finger of the operator, who need not remove his hand from the tool in order to properly control the current.

The barrel 11 at the end remote from the body 10 is entered by the threaded end of a tubular extension 24, this tubular extension abutting within the barrel 11 against a seated washer 25, which latter may be of insulating material. That end of the tubular member 24 remote from the barrel 11 is expanded into a receptacle 26 initially threaded to receive the threaded stem 27 of a bell head 28 of insulating material and provided with an axial passage 29 extending through the threaded stem 27. The outer end of the head 28 is open and forms a flange 30 in which are matching depressions 31, 32. The depressions or sockets 31 are arranged in a plane centrally cutting the barrel 11 and the two members 1 and 2 of the handle of the tool. There are two depressions or sockets 32 on opposite sides of one of the depressions 31, and these depressions have a rear slanting wall 33.

Extending through the tubular member 24 and also through the barrel 11 is a rod 34 ending within the head 28 in an eye 35 in the construction shown in Figs. 2 and 3 and in a hook 36 in the construction shown in Fig. 6, the inner wall of the hook being roughened or toothed, as shown at 37, and arranged at an angle to the length of the rod 34. The end of the rod 34 remote from the eye or hook, which latter constitutes a clamping member for an electrode rod 38, has secured thereto a block 39 by means of screws 40 or in any other appropriate manner. Between the block 39 and the washer 25 the rod is surrounded by a spring 41 tending at all times to draw the holding member 35 or 36, as the case may be, against the electrode 38, with the latter seated in the recesses or sockets 31 or 32, as the case may be. The block 39 receives that end of the conductor 7 which is contained within the body 10 of the tool, the conductor being long enough for the purpose, and is held to the block 39 by screws 42 or in any other appropriate way.

There is also a link 43 within the body member 10, which link is made fast to the block 39 by screws 44, or in any other appropriate way, the link being electrically insulated from the block 39 by insulating material 45 separating the screws 44 from the link 43. The handle branch 2 adjacent to its union with the body member 10 is formed with ears 46 on opposite sides of a slot 47 leading into the space between the two branches 2 and 3. The ears 46 carry a pivot pin 48 on which is mounted a trigger 49 having a finger piece within the space between the two branches 1 and 2 and an arm 50 within the handle branch 2. The link 43 has a flattened extension 51 pivoted to the arm 50, which latter may be split to have the flattened extension 51 lodged in the split portion of the arm 50. In this way the operator grasping the handle member 2 may readily manipulate the trigger 49 without removing the hand from the tool to move the rod 34 against the normal tendency of the spring 41, such movement of the rod releasing the grip of the eye 35 or hook 36 upon the electrode 38. In order to support the block 39 it is mounted upon a strip 52 of insulating material in turn mounted in the body 10 in a dovetail recess or in any other suitable manner.

When the electrode rod 38 is lodged in the recesses or sockets 31 which are located diametrically opposite each other, the rod is supported in the longitudinal plane of the barrel 11 and handle portion 1 of the tool, the rod being perpendicular to the longitudinal axis of the tool. If the rod 38 be loosened and then moved to one side or the other of the position it occupies in the recesses 31 and is lodged in one or the other of the recesses or sockets 32, then the rod is

tilted forwardly or rearwardly, since there is but one recess 32 for either position of the rod 38 on opposite sides of the recesses 31. The rod 38 engages the outer edge of the flange 30 on one side of the longitudinal axis of the tool and is seated in a recess 32 on the other side of the longitudinal axis of the tool, so that the rod is given an angular position sidewise with respect to the position of the rod 32 when seated in the recesses 31 and at the same time is given a forward or rearward pitch.

Experience has shown that for all ordinary uses the three positions provided for are sufficient. Of course by increasing the number of recesses in the flange 30 and differently locating these recesses, other angular positions may be attained.

The lock nut 5 is a convenient way of holding the conductors in fixed relation to the tool where entering the casting 1, but there is a liability of breaking the neck 4 because of the extent of projection in order to carry the nut 5. To reduce the length of the neck 4 or even to completely obliterate it and still firmly hold the conductors, the arrangements of Figs. 7 to 10 may be provided. In Figs. 7 and 8 there is a short neck 53 through which the conductors 7 and 8 are passed, and this neck carries a set screw 54 engaging a bearing and clamp plate 55 within the neck, thus crowding the conductors 7 and 8 together in a manner to hold them against accidental displacement.

In the structure of Figs. 9 and 10 the neck 4 or 53 is entirely omitted. A clamp block 56 is cast in the handle portion and the latter is provided with a passage 57 leading into the handle portion adjacent to the block 56, which latter is formed with grooves 58 to receive the conductors 7 and 8. A movable clamp block 59 is located in the handle portion and is urged by a screw 60 into engagement with the conductors 7 and 8 forcing them into firm engagement with the block 56 and thereby clamping them against displacement.

There are certain features of the welding tool, such as the pistol grip, and some other parts, which are shown, described and claimed in another application filed by me on February 21, 1917, No. 150,095, for an electric welding tool, and hence those features which are common to both applications are not herein claimed, being covered by the application already filed.

The welding tool may be used for cutting purposes by replacing the rod 38 with a sufficient length of copper wire, of suitable gage to carry about 250 to 300 amperes, with the end of the wire formed into the customary coil for holding the graphite pencil usually employed for electric cutting purposes.

What is claimed is:—

1. An electric welding tool provided with a handle portion, an electrode holder provided with seats for an electrode in different angular relations to each other, and clamping means for the electrode having a normal tendency to clamp the electrode to any chosen ones of the seats.

2. An electric welding tool provided with a handle portion and an electrode holder having a series of electrode seats arranged circumferentially of the longitudinal axis of the holder, and clamping means movable lengthwise of the holder for forcing the electrode in any chosen ones of the seats.

3. An electric welding tool provided with a handle portion, an electrode holder on the handle portion having a series of electrode seats arranged circumferentially of the longitudinal axis of the tool, and clamping means for holding the electrode in any chosen ones of the seats, said clamping means being provided with means for imparting to it a normal tendency toward the electrode clamping position.

4. An electric welding tool provided with an electrode holder having a hollow head with a terminal flange, a series of seats in the flange arranged circumferentially of the longitudinal axis of the tool, and clamping means for the electrode for maintaining the latter in any chosen ones of the seats.

5. An electric welding tool provided with an electrode holder having a hollow head with a terminal flange, a series of seats in the flange arranged circumferentially of the longitudinal axis of the tool, and clamping means for the electrode for maintaining the latter in any chosen ones of the seats, certain of the seats being arranged diametrically of the longitudinal axis of the holder and others of the seats being arranged on opposite sides of the first-named seats.

6. An electric welding tool provided with an electrode holder having a hollow head with a terminal flange, a series of seats in the flange arranged circumferentially of the longitudinal axis of the tool, and clamping means for the electrode for maintaining the latter in any chosen ones of the seats, certain of the seats being arranged diametrically of the longitudinal axis of the holder and others of the seats being arranged on opposite sides of the first-named seats, the second named seats slanting away from the outer end of the electrode holder to impart a rearward tilt to the electrode when lodged therein.

7. An electric welding tool comprising a handle portion with a barrel projecting therefrom, an open ended hollow head beyond the barrel portion and provided with seats at its outer end for an electrode, a rod extending through the barrel and into the head and there terminating in an electrode engaging member, a spring on the rod within the barrel having a normal tendency to

move the rod away from the head to clamp the electrode in the head, and a manipulating member for the head at the handle portion within reach of the finger of a hand gripping the handle portion to release the electrode by the movement of the member to propel the rod in opposition to the spring.

8. An electric welding tool comprising a handle portion with a barrel projecting therefrom, an open ended hollow head beyond the barrel portion and provided with seats at its outer end for an electrode, a rod extending through the barrel and into the head and there terminating in an electrode engaging member, and a spring on the rod within the barrel having a normal tendency to move the rod away from the head to clamp the electrode in the head, and a manipulating member for the head at the handle portion within reach of the finger of a hand gripping the handle portion to release the electrode by the movement of the member to propel the rod in opposition to the spring, the head being provided with a series of seats for the electrode arranged circumferentially of the longitudinal axis of the tool.

9. An electric welding tool comprising a handle member of pistol-grip conformation, a barrel member extending therefrom and provided with a head beyond the outer end of the barrel member with said head formed with seats for an electrode rod arranged circumferentially of the longitudinal axis of the barrel, a rod extending through the barrel and into the head and there formed to grip the electrode and hold it in chosen ones of the seats, a conducting block carrying the rod within the barrel and having means for the attachment of an electric conductor thereto, a spring on the rod within the barrel engaging the head and imparting to the rod a normal tendency to clamp the electrode in a chosen position in the head, and a trigger actuating device for the rod located at the handle portion of the tool for loosening the electrode by a pull on the trigger by a finger of the operator without removing the hand from the handle of the tool.

10. An electric welding tool provided with a handle portion of pistol-grip conformation and a barrel portion projecting therefrom, an electrode holder carried by the barrel portion at the end remote from the handle, means for clamping an electrode in different positions in the electrode holder, a manipulating means for the electrode clamping means having an operating portion in the handle part of the tool, and an electric switch for distant control of current fed to the tool and located in the handle portion on the face of the pistol grip remote from the manipulating means.

11. An electric welding tool provided with a pistol grip handle, an electrode holder projecting from the handle, and an electric switch for distant control of current fed to an electrode in the holder, comprising a rock contact member within the handle, other contacts in the path of the rock contact member and also within the handle, and operating devices for the rock member projecting through the handle to the exterior thereof, said handle having an exterior depressed portion for receiving the switch operating means with the latter below the contour line of the handle.

12. An electric welding tool provided with a handle portion comprising two spaced hollow members joined at the ends, an electrode holder projecting from one of the joined ends, and holding means for electric conductors entering the handle portion and extending into the two hollow members thereof, said hollow portion having means at the conductor-entering part for clamping the conductors against accidental displacement where entering the handle.

13. An electric welding tool provided with a handle portion comprising two spaced hollow members joined at the ends, an electrode holder projecting from one of the joined ends, and holding means for electric conductors entering the handle portion and extending into the two hollow members thereof, said hollow portion having means at the conductor-entering part for clamping the conductors against accidental displacement where entering the handle, said handle portion being provided with an electric switch in that member of the handle portion constituting the gripping member with the switch having manipulating devices extending to the exterior thereof and the handle portion where traversed by the switch manipulating devices being exteriorly depressed for locating the manipulating devices in their normal positions within the contour line of the handle.

14. An electric welding tool comprising a hollow handle portion of pistol grip and guard conformation with the grip and guard united at one end and there provided with an entrance for electric conductors, and means for clamping the electric conductors against accidental displacement and also joined at the other end, a barrel constituting a continuation of the handle portion, a removable face plate for exposing the interior of the body of the tool, an electric switch housed within the handle portion and having manipulating members sunken into the handle portion within the contour line thereof, an electrode holder projecting from the barrel portion and provided with seats for the electrode in different angular positions circumferentially of the electrode holder about the longitudinal axis of the tool, and clamping means for the electrode

having a normal tendency toward the clamping position and provided with manipulating means in the handle portion projecting into the space between the pistol grip and guard, said pistol grip and guard also forming conduits for the electric conductors entering the tool.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILSON E. SYMONS.

Witnesses:

THOMAS M. FLANAGAN,
ANDREW L. GORHAM.