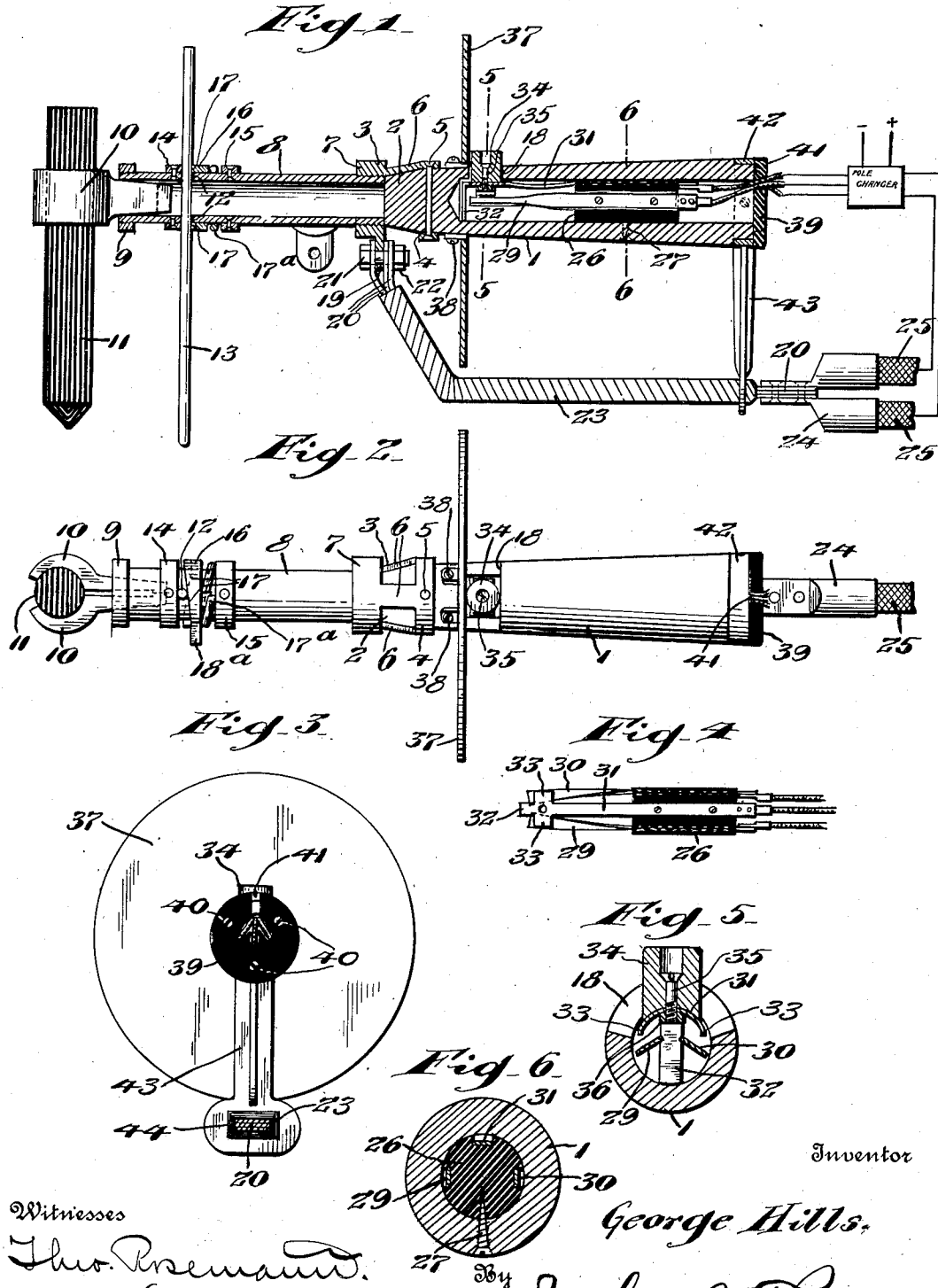


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COMBINATION METALLIC AND CARBON ELECTRODE HOLDER.
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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE HILLS, a British subject, residing at Westfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Combination Metallic and Carbon Electrode Holders, of which the following is a specification.

My invention relates to improvements in combination metallic and carbon electrode holders, the object of the invention being to provide a device of this character adapted for the arc system of electric welding and which is provided with improved means for changing the current so as to reverse the polarity and enable the utilizing of both the metal and the carbon electrode as desired.

A further object is to provide a device of this character having improved means for securing a metal electrode which enables the electrode to be adjusted longitudinally and to be readily removed and replaced as desired.

A further object is to provide in the handle of the device an improved construction of switch controlled by a button which enables the current to be reversed to reverse the polarity in accordance with the electrode in operation.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1, is a view in longitudinal section illustrating my improvements. Fig. 2, is a top plan view. Fig. 3, is an end view showing the supply bars in section. Fig. 4, is a plan view of the switch structure located within the handle. Fig. 5, is a view in section on an enlarged scale on the line 5-5 of Fig. 1, and Fig. 6, is a similar view on the line 6-6 of Fig. 1.

1, represents a hollow handle preferably of wood or other suitable non-conducting material having a reduced end 2 onto which a metal coupling 3 is secured. This metal coupling consists of a band 4 secured around the end of the handle by means of a rivet 5, and connected by integral longitudinal straps 6 with an internally screw-threaded collar 7.

A metal tube 8 is screwed into the collar 7 against the end of handle 1, and on its

outer end is externally screw-threaded for the reception of a reinforcing ring 9. Into the outer end of this tube 8, a sectional clamp 10 is forced and securely clamps a carbon electrode 11 by reason of the cam action of said clamp when forced into the tube as will be readily understood. The tube 8, is provided near its outer end, with registering openings 12 through which a metal rod 13 is projected, and constitutes a metal electrode. Two collars 14 and 15 are fixed around the tube 8 at opposite sides of the opening 12, and a movable ring 16 is mounted between said collars, normally bears against one collar, and has a cam face 17 which is adapted to bear against the electrode 13 and securely bind it against movement. A lug 18^a is provided on this ring 16 to facilitate its rotary motion on the tube, and it will be understood that when this ring is turned in one direction, it will clamp the electrode and when turned in the other direction will release the electrode to allow the same to be adjusted or replaced. A spring washer 17^a is interposed between the collar 15 and ring 16 to maintain a constant pressure of the latter against the metal electrode.

A perforated ear 19 is made integral with collar 7, and to opposite sides of this ear, metal bars 20 are secured by a bolt 21 and nut 22. These bars constitute feeders for the electric current, and are covered by insulation 23. At their outer ends they are connected by a coupling 24 with insulated feed wires 25 which carry the necessary current for the electrodes. Inside of the hollow handle 1, a block 26 of insulation is secured by means of a screw 27. This block 26 is grooved longitudinally at its sides and top as illustrated in Fig. 6, for the reception of metal strips 29, 30, and 31, respectively, the strips 29 and 30 being at the sides and the strip 31 at the top of the block. The strips 29, and 30, are connected with a suitable switch as shown diagrammatically in Fig. 1 for reversing the polarity of the current, while strip 31 is connected by a wire with the ground or other circuit making device. The inner free ends of the strips 29 and 30 are preferably twisted or bent as shown most clearly in Fig. 5, and the extreme end of strip 31 is bent at right angles forming a tongue 32 which extends to the lower wall of the opening in the handle. The strip 31, near its inner end, is

made with downwardly curved electric contacts 33, and a button 34 is secured by a screw 35 and nut 36 to said strip.

Button 34 projects through a slot 18 in the handle 1, and is adapted to be moved to either side, so as to close the electric circuit between either of the contacts 33 and the strips 29 and 30. The tongue 32 prevents strip 31 from being forced downwardly by the button, so as to contact with both of the strips 29 and 30 at the same time, but compels the button to be swung laterally so as to make contact with one of said strips only at a time.

A metal shield 37 is secured on the inner end of the handle 1 by means of screws 38, and a disk of fiber 39 is secured to the outer end of the handle by means of screws 40. This disk 39 has a recess 41 through which the wires of strips 29, 30 and 31 project. This disk 39 also serves to confine a metal ring 42 in a restricted end of the handle, and this ring 42 has a depending bar 43 integral therewith and having an angular opening 44 in its lower end to receive the bars 20 and support them in relative relation to the handle.

My improved device is capable of a wide range of utility to enable the use of both the carbon and the metallic electrodes. For example, while the drawings show the button 34 in a neutral position, the operator may readily move it to one side so as to close the circuit through either of the strips 29 and 30. When the circuit is closed through one of these strips, the carbon electrode 11 may be utilized as the negative pole so as to heat metal to welding temperature. The button may then be swung to reverse the polarity and the metallic electrode 13 brought into contact with the metal so as to deposit the particles from the metal electrode and fill up any spaces which may exist forming a perfect metal joint. The polarity may be reversed, simply by shifting the position of the button 34. This device is particularly adapted for use in connection with boilers, locomotive frames, and in other places which are awkward to reach with devices in general use. It is of course, to be understood that the electrodes are both positioned with relation to the metal to form an arc, whereby the maximum of heat is attained, and that the metal electrode will gradually be eaten away when the metal is brought to the state of fusion by reason of the arc.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a handle of non-

conducting material, an electric conductor secured to the handle, and carbon and metallic electrodes secured to the electric conductor and extending at an angle thereto, in combination with a pole changer and a reversing switch on said handle adapted to control said pole changer substantially as described.

2. The combination with a handle of non-conducting material, a metal tube secured to said handle, an electrode positioned at an angle to the tube, and means securing said electrode to the tube, whereby the same may be adjusted longitudinally, substantially as described.

3. The combination with a handle of non-conducting material, a metal tube secured to said handle, carbon and metallic electrodes secured in said tube, means for supplying an electric current to said tube, in combination with a pole changer and a reversing switch in said handle adapted to control said pole changer, substantially as described.

4. A combination metallic and carbon electrode holder consisting of a hollow handle, a metal tube secured to one end of said handle, a clamp positioned in the free end of said tube and adapted to receive a carbon electrode, an opening through said tube, a metal electrode positioned in said opening, fixed rings on the tube, and a ring around the tube between said fixed rings having a cam face to engage said metal electrode, substantially as described.

5. In a device of the class described, a combination metallic and carbon electrode holder in combination with a pole changer, said holder consisting of a hollow handle of non-conducting material, a metal tube secured on one end of said handle, carbon and metallic electrodes secured in said tube, electricity supply devices connected in circuit with said tube, a block secured in the hollow handle, three metal strips supported in said block, wires connecting said strips to said pole changer, and a button secured to one of said strips and projecting through a slot in the handle, said button adapted to be moved to connect the intermediate strip with either of said side strips, whereby the polarity of the current may be reversed, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE HILLS.

Witnesses:

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