Aug. 27, 1929. G. EATON 1,726,427

ELECTRICALLY HEATED HAND TOOL SWITCH

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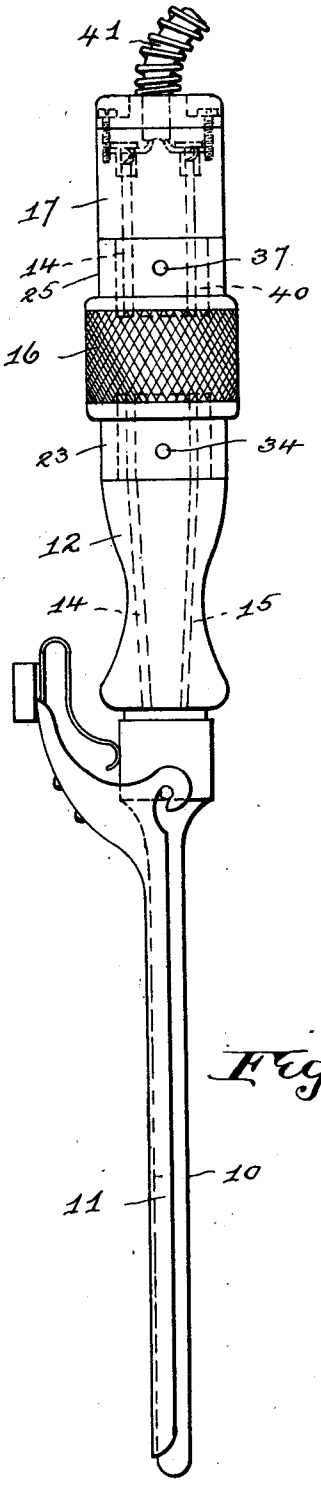

Fig. 1.

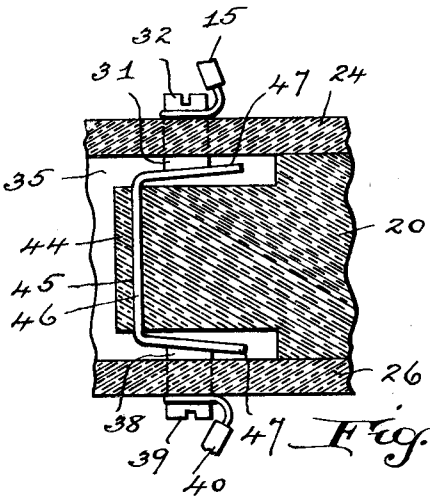

Fig. 8.

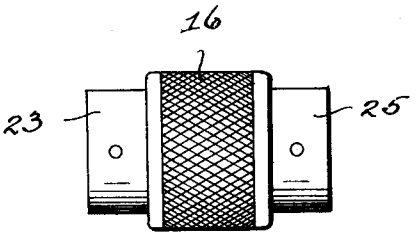

Fig. 9.

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ELECTRICALLY HEATED HAND TOOL SWITCH

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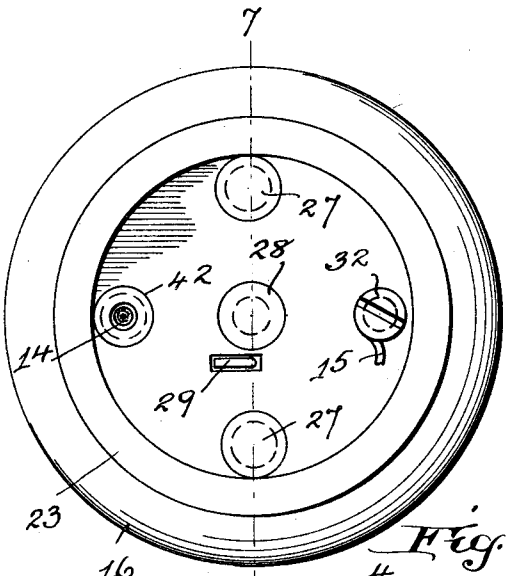

Fig. 3.

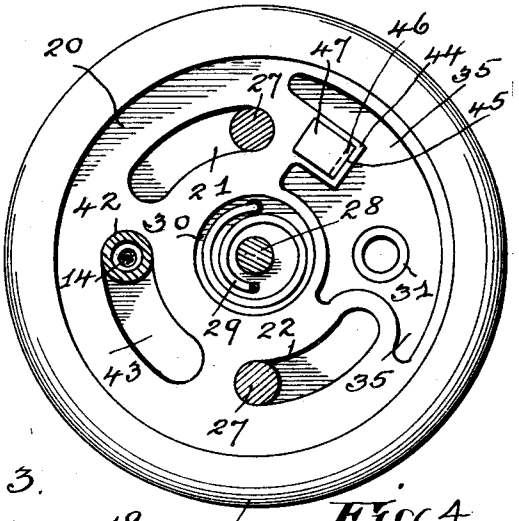

Fig. 4.

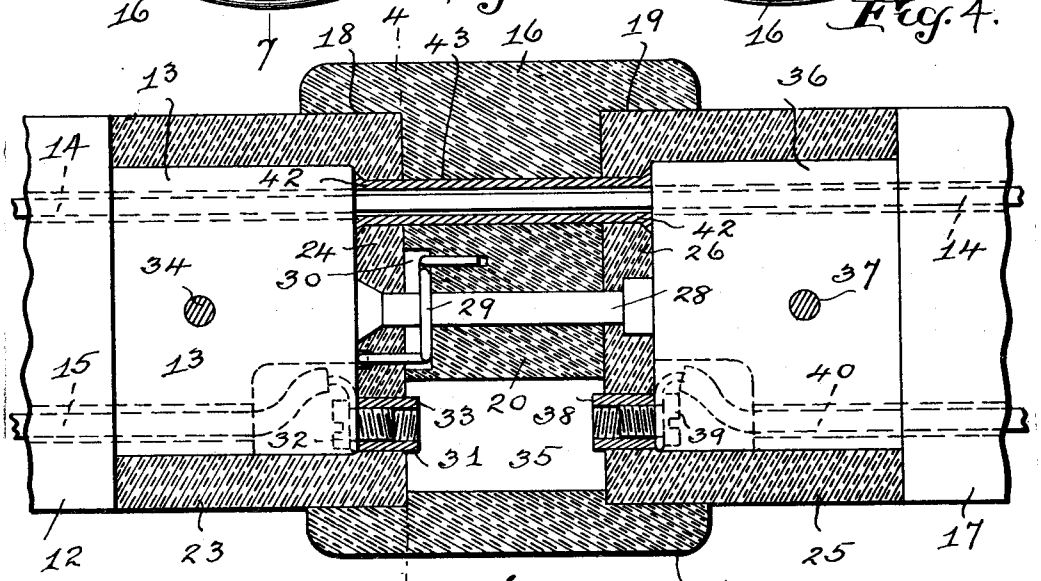

Fig. 2.

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ELECTRICALLY HEATED HAND TOOL SWITCH

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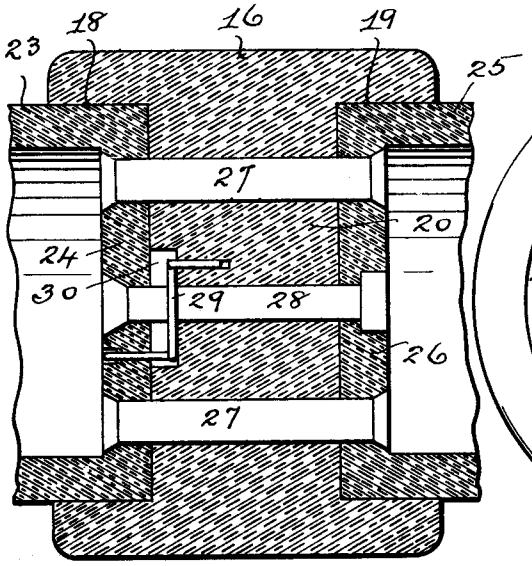

Fig. 7.

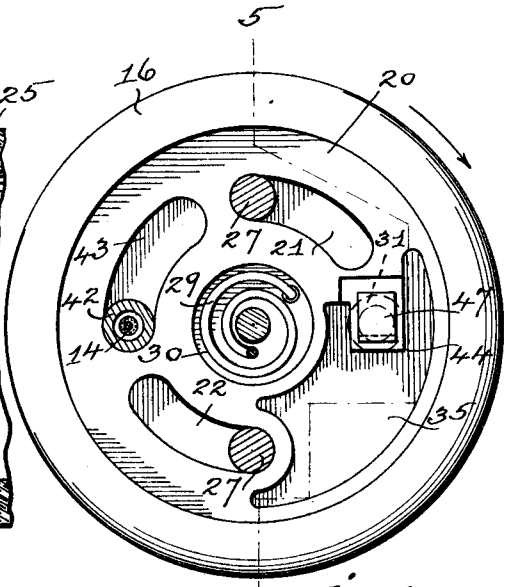

Fig. 6.

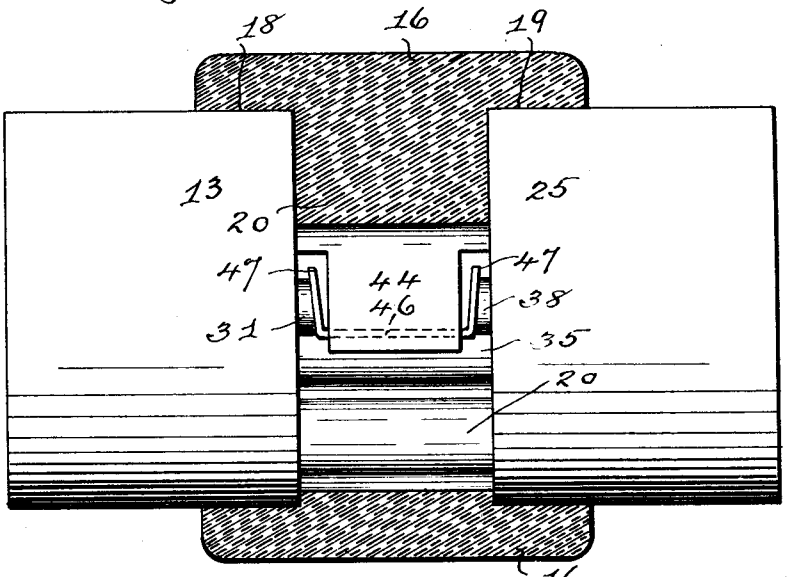

Fig. 5.

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UNITED STATES PATENT OFFICE.

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ELECTRICALLY-HEATED HAND-TOOL SWITCH.

Application filed April 27, 1926. Serial No. 104,864.

This invention relates to improvements in electrically-heated hand tools such as curling irons or soldering irons.

The object of the invention is to provide a tool of the character named whereby the current to heat the same may readily be controlled by the same hand which manipulates the iron.

It is not an infrequent thing for the operator of a hand tool to lay the same down without cutting off the electric current and through oversight or being called away giving no thought to the heating tool until the same has become overheated or caused some damage.

The present invention is therefore designed to avoid these objections by including in their structure a means which will automatically cut off the current when the tool is released by the hand which manipulates it.

The invention is illustrated in the accompanying drawing wherein I have elected to show the same in connection with a curling iron but it is to be understood that the same may readily be applied to any tool that is to be grasped in one hand while it is manipulated.

In the drawing,—

Fig. 1, shows a complete curling iron with my improved device enclosed in the handle thereof.

Fig. 2, illustrates, on a much enlarged scale, a longitudinal section through the handle and my improved device,—the parts however being shown in a position with the current cut off.

Fig. 3, shows, also on a much enlarged scale, the current controlling element detached and as viewed from one end thereof.

Fig. 4, illustrates the actuating portion of the controlling element as the same would appear if viewed on the line 4—4 of Fig. 2.

Fig. 5, shows the same parts as are illustrated in Fig. 2 but with the parts in the position to close the electric circuit and heat the tool.

Fig. 6, illustrates the structure disclosed in Fig. 4, but with the parts in the operated position.

Fig. 7, shows a sectional detail on the line 7—7 of Fig. 3.

Fig. 8, illustrates a cross-sectional detail showing the circuit-closing devices in the operating position, and

Fig. 9 shows the detached circuit-closing unit.

In the drawing the numerals 10 and 11 designate respectively the stationary and clamping members of the curling-iron. This structure is merely used for illustrative purposes only and may be varied.

The stationary member 10 is attached to a handle part 12, of insulating material which latter in this instance has a reduced plug-end 13 for a purpose that will presently be explained.

The conductor wires 14 and 15 extending into the heating element of the stationary member 10, are indicated as passing in spaced relation through the handle-part 12 in Figs. 1 and 2.

The handle is formed in three parts or units and include the parts 12, 16 and 17,—the parts 12 and 17 being stationary and the part 16 being movable.

The movable part or unit 16 has a collar-like formation with a socket 18 at one side and a similar socket 19 at the opposite side. Between these two sockets 18 and 19 the movable unit has a separating body-part 20 which is provided with two segmental slots 21 and 22 for a purpose that will presently be explained.

In the socket 18 at one side of the movable part 16 there is seated a cup 23 which has an inner circular wall 24 that seats flat against the body-part 20 while the socket 19 at the other side of the movable part 16 receives another cup 25 that has a circular wall 26 which seats flat against the opposite side of said body-part 20.

These cups 23 and 25 are connected through the body-part 20 by bolts or rods 27, which extend through the segment-slots 21 and 22, so that while the movable part 16 is interposed between the two cups 23 and 25, the latter are held seated against opposite sides of the movable part by the said bolts that pass through the segment-slots. By providing the segmental slots I enable the movable part to have an oscillating movement between the cups,—the length of the segmental slots determining the extent of such oscillating movement.

In the present instance I also make use of

a central pivot-pin 28 which extends through the body-part 20 and engages the circular walls 24 and 26 of the cups on opposite sides thereof whereby to rotatably clamp the member 16 between the cups.

A coiled spring 29, is confined in a central recess 30 about the pivot-pin 28 and has one end attached to the unit 16 while its other end is attached to the cup 23. By means of this spring the movable unit is normally held in what may be termed a retracted position but may be rotated to a limited extent against the action of the spring.

The cup 23 has a bushing contact 31, extending through its circular wall 24, and a binding post or screw 32, is screwed into this bushing so that the conductor wire 15, in the handle-part 12 may be engaged with the said bushing. The bushing-contact 31 has a slightly beveled projecting end 33 for a purpose that will also presently be explained.

The handle unit 12, has its reduced plug-end 13 entered in the cup 23, and this is secured therein by a cross-pin 34, extending through the cup and reduced end.

To make provision for the projecting end 33 of the contact-bushing 31, I provide the body-part 20 of the movable unit with a segmental-slot 35 as clearly shown in Figs. 2 and 4.

The cup 25, at the rear end of the movable unit 16, receives the reduced end 36 of the stationary handle-part 17, and a cross-pin 37, secures this cup and handle-part together.

The cup 25 also has a bushing-contact 38, in which a screw or post 39 is located, and this bushing has the same tapered formation at its end as has the bushing 31. The two bushings 31 and 38 are directly opposed,—entering the segmental-slot 35 at opposite sides but are sufficiently spaced to prevent electric arcing between them.

A wire 40 is engaged with the screw or post 39 and extends through the stationary handle-member 17 to a conductor cable 41, that enters the end thereof.

A conductor-tube 42, extends through a segmental slot 43 in the body-part 20 and one end of this tube extends through the circular wall 24 of cup 23 while the other end of said tube extends through the circular wall 26 of the cup 25.

The purpose of this tube is to provide a conduit through which the conductor wire 14, may extend in passing from the stationary handle-member 12 to the handle-member 17.

The movable unit 16 has a lug or arm 44 extending from its body-part 20 into the segmental slot 35 as shown in Figs. 4–6 and 8 of the drawings and this lug or arm is provided with a cross-slot 45, so that a spring contact-plate 46, may be passed therethrough and have its free ends 47 bent backwardly to form inclined contact faces at opposite sides of the body.

The two ends 47 of the contact-plate 46 therefore have position at opposite sides of the body-part 20 so that one of them, when the movable unit 16 and its body-part 20 are turned on the pin 28, will engage contact-bushing 31 while the other will engage the contact-bushing 38 and thus close the circuit through those two bushing-contacts.

It will thus be understood that to close the circuit through the heater member 10, the operator will simply turn or partially rotate the movable unit 16 which rotation will move the contact plate 46—47 between and into engagement with the two spaced bushing-contacts 31—38 and thus close the circuit. During the rotating closing movement of this unit 16, the spring 29 will be placed under tension so that to maintain the closed circuit the unit 16 will be held by the hand grasping the handle,—the unit being smaller than the hand so that the stationary handle-parts 12—17 or either of them will be gripped at the same time the movable unit is held rotated.

If the tool is laid down or the grasp on the movable unit 16 released, then said unit will immediately be returned by the spring 29 to its normal cut-off position and thus automatically interrupt the circuit.

It will therefore be understood that the circuit will only remain closed so long as the movable unit 16 is held in the rotated position by the hand-grasp and against the action of the coiled spring so that when said unit is released it will immediately move to the normal position and open the circuit.

Obviously, the heating operation can only continue while the operator deliberately causes it to do so and thoughtlessness as to cutting off the current is not a matter for consideration as the structure operates automatically on this side of safety.

Having described my invention, I claim:—

1. In an electrically-heated hand-manipulated tool having a single handle adapted for gripping engagement by one hand, said handle including a stationary part and a rotating part,—the rotating part carrying a switch and conductors passing through the handle and closed by the switch on the rotary part.

2. In an electrically-heated hand-manipulated tool the combination with two stationary handle-parts, of a rotary unit between said two stationary parts said handle parts and rotary unit constituting a single handle, a switch carried by the rotary unit, stationary contacts carried by each stationary part and engaged by the switch on the rotary unit and yielding means for normally holding the rotary unit with the switch out of engagement with said stationary contacts.

3. In an electrically-heated hand-manipulated tool having a single handle comprising two stationary handle elements and a rotary element between said stationary elements, the

combination of a switch device carried by and on the interior of the rotary element, stationary contacts at opposite sides of the rotary element, yielding means to normally hold the rotary element so as to keep the switch out of engagement with the stationary contacts and a continuous conductor extending through the rotary element from one stationary element to the other.

4. In an electrically-heated hand-manipulated tool having a single handle comprising two stationary handle elements, the combination of a rotary handle element interposed between the two stationary elements said rotary element having slots therein, stationary contacts in each stationary element and exposed at opposite sides of one of the slots of the rotary element, a switch device carried by said rotary element at said one slot to engage the two stationary elements, a conductor tube extending through a slot of the rotary element from one stationary element to the other and conductors in the handle and one extending through said tube while others engage the two stationary contacts.

5. In an electrically heated, hand-manipulated tool, the combination with a single handle for manipulating the tool, of conductors extending longitudinally of said handle, and a rotatable device associated with the handle and adapted to be simultaneously grasped by the hand that manipulates the tool, said rotatable device being adapted for reversible rotary movement by the same hand which manipulates the tool so as to effect a closing of the circuit through the conductors when moved in one direction to and while held in such position by the hand, and to effect opening of the circuit upon being moved in the opposite direction.

6. In an electrically heated, hand-manipulated tool, the combination with a single handle having a stationary element and a reversibly movable element adapted to be both grasped simultaneously by the same hand, of an electric switch device controlled by said movable element and adapted to be closed by movement of said movable element and to be held closed while said movable element is held in such position, and electric conductors to and from the tool and including the said switch, said movable element being provided with means whereby it is normally held in position corresponding to an open circuit through the conductors and being adapted to be reversely moved to and held by the hand in the circuit-closing position.

7. In an electrically heated, hand-manipulated tool having a single handle, said handle comprising a stationary hand-grasp part and a rotatable spring-controlled unit which controls an electric switch, the stationary part and the rotatable unit both being arranged to be grasped simultaneously by the same hand, electric conductor means passing through both of said hand-grasp parts, and said spring control being adapted to normally hold the rotatable unit in a position corresponding to open position of the switch, and said rotatable unit being adapted for movement to position corresponding to closed position of the switch.

In testimony whereof I affix my signature.

GEORGE EATON.