

1,186,773.

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UNITED STATES PATENT OFFICE.

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ELECTRIC SELF-FEEDING SOLDERING-IRON.

1,186,773.

Specification of Letters Patent.

Patented June 13, 1916.

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To all whom it may concern:

Be it known that I, HARRY H. HARRIS, a citizen of the United States of America, residing at Oconto, in the county of Oconto and State of Wisconsin, have invented certain new and useful Improvements in Electric Self-Feeding Soldering-Irons, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in electric soldering-irons, and consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide a soldering-iron which is adapted to receive a stick of solder, from which the melted solder may be delivered as desired.

A further object of my invention is to provide a novel means for permitting or stopping the flow of melted solder, and a means for readily adjusting the flow to suit the class of work being done.

A still further object of my invention is to provide a soldering-iron whereby the electrical heating element may be dispensed with, so that the soldering-iron may be heated in the usual way by a tinner's blast furnace, when so desired.

With these and other objects in view this invention consists of certain novel combinations, constructions and arrangements of parts as will be hereinafter fully described and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of a soldering-iron constructed in accordance with the invention. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a sectional plan view of the soldering-iron taken on line 3—3 of Fig. 2. Fig. 4 is an enlarged sectional view, showing the means for permitting or stopping the flow of melted solder. Fig. 5 is an enlarged sectional view, showing the means for adjusting the flow of melted solder. Fig. 6 is a perspective view of a ferrule or tube which is adapted to take the place of the electrical heating element, when the iron is to be heated in a furnace. Fig. 7 is a side elevation, partially in section of the electrical heating element or coil.

By referring to the drawing, 1 designates the soldering-iron tip, preferably formed of copper and which may be of the pyramidal form in common use, or of hatchet style generally used for running seams. This tip is

provided with a passage 2 extending longitudinally to the point or apex of the iron. The upper end of the tip 1 is internally threaded and is adapted to receive a screw 3, having a passage 4 which is in alinement with the passage 2 in the tip member 1. This passage 4 runs centrally of the screw 3 and ends in an aperture or bore 5, which is at right angle with the passage 4. A valve pin 6, having a somewhat pointed end, 7 is adapted to work in the bore 5 said bore being large enough to allow for the expansion of the pin 6 when heated. An aperture 8 connects the passage 4 with the passage 9 and is bored to fit the end 7 of the valve pin 6, so as to provide a seat for the said pin for stopping the flow of solder. The upper end of the valve pin 6 is adapted to receive an end 10 of a lever 11. A finger piece 14 preferably made of wood, is provided at one end with a metal ferrule 15. A threaded end 16 of the lever 11 carries the finger piece 14. A knurled manipulating screw 17 passes transversely through the finger piece 14 and nut 18, positioned within the piece 14.

A coil spring 19 is interposed between the finger piece 14 and a washer or plate 19^a, which plate is soldered to the end of the said spring. The spring 19 encircles the projecting end of the screw 17 and is adapted to normally hold the valve pin 6 down against its seat 8. The manipulating screw 17 may be screwed down against the plate 19^a, which would prevent the valve pin 6 from being accidentally raised when the iron is not in use.

It will be seen that the point 21 of the manipulating screw 17 will act as a stop for the lever 11. By moving the screw 17 in or out, the throw of the lever 11 will be adjusted to raise the pin 6 the desired distance to give the required flow of solder.

An electrical heating coil 22 contained within the casing 23, is composed of alternate layers of resistance wires and interposed insulating material, preferably mica. This casing 23 has an inner longitudinally extended central tubular portion 24, which is cast integral with the outer casing 23, so as to prevent the admission of acids to the interior of the casing and destroying the resistance coil carried thereby. A cover or cap 25 is adapted to fit over rear end of the casing 23 and is secured thereto by means of the screws 25^a. A nut 26 fitting in the

forward end of the casing 23, is internally threaded on the screw 3, and on the outer end of the tube 27 and holds their ends in an abutting position. The tube 27 passes through the tubular portion 24 and engages a nut 28 carried by the cap 29. A handle 20 is secured to the cap 29 and fits over the rear end of the tube 27. This tube 27 has a tapering bore which is adapted to receive a stick of solder 30, the said tapering bore having its large diameter toward the tip 1, which will always leave the stick of solder free to move toward the screw 3.

To insert the stick of solder 30, the cap 29 and nut 28 are removed, allowing access to the bore within the tube 27, the stick 30 is then inserted, when the cap 29 and nut 28 are again replaced on the handle 20. A nut 31 screw threaded to the external threads 32 on the tube 27, is screwed down against a shoulder 33 in the handle 20 and prevents the same from being displaced when the cap 29 is removed.

Asbestos packing 34 is placed within the handle 20, and surrounds the ferrule 35, through which the tube 27 passes, and prevents the handle 20 from becoming too hot to be handled. Asbestos washers 36 are placed within the nut 28, to prevent the solder 30 when melted from leaking out of the nut 28 when in an inverted position and hanging there when cooled off. Connecting posts 37 are carried by the cap 25 and are entirely insulated therefrom, and these posts are adapted to be connected to wires leading to the source of current. The coil 22 is entirely insulated from the casing 23, by suitable insulation preferably a sheet of mica, to prevent short circuit. A ferrule 38 is adapted to take up the space occupied by the casing 23, when the latter is removed for heating the iron in a furnace. The said ferrule 38 would be carried by the tube 27, between the nut 26 and tube 13 so as to prevent displacement of the tube 13 and handle 20.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. The solder is inserted within the tapering bore of the tube 27 by removing the cap 29 and nut 28 carried thereby. The contact posts 37 are connected by wires to any convenient source of current of the required voltage. The resistance element 22 will cause the heating of the tube 27 which will heat the tip 1 and also the solder 30 when the latter will begin to melt. Pressure on the finger piece 14 will cause the valve pin 6 to be raised from its seat 8. The solder will thereupon run out through the passage 9 and aperture 8 to the passage 4 and then out at the tip to the place where it is to be applied. When the lever 11 is released the spring 19 will cause the pin 6 to seat so as to shut off the flow of solder. By removing or adding

washers 39 the tip 1 may be turned so as to bring the outlet on the side desired to suit the hand of the operator.

Various changes in form, proportion and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims.

Having thus described the invention, what is claimed is:—

1. In an electric soldering-iron, the combination of a tubular member having a tapering bore for the reception of a bar of solder, a casing carried by said tubular member, a resistance coil contained within said casing and surrounding said tubular member, a nut carried by said tubular member, a screw carried by said nut, a tip carried by said screw, said tip provided with a solder passage, said screw communicating with the tapering bore in said tubular member for conducting the liquid solder to the exterior of the soldering-iron, a valve carried by said screw adapted to control the flow of liquid solder, a lever connected to said valve for operating said valve, a spring for keeping said valve normally closed, and means for limiting the throw of said lever, substantially as set forth.

2. In an electric soldering-iron, a hollow tubular member adapted to receive a bar of solder, a handle carried by said tubular member, a bushing carried by said handle and surrounding said tubular member, non-combustible packing surrounding said bushing and bearing against the inner wall of the handle, a detachable cap carried by said handle, an electrical heating element contained within a casing, said casing and heating element surrounding said tubular member at one end thereof, said electrical heating element adapted to be connected to a source of current for melting the solder, a screw member having passages for conducting the liquid solder to the exterior of the soldering-iron, and a valve for controlling the flow of melted solder through said passages, substantially as set forth.

3. The combination in a soldering-iron, a tip member having a solder passage there-through, a screw carried by said tip member having two separate solder passages, one of said passages registering with the passage in said tip member, the other passage registering with a receptacle adapted to contain a bar of solder, said screw provided with an aperture connecting the two separate passages, a valve adapted to seat in said aperture for controlling the flow of liquid solder, a lever connected at one end to said valve, a handle engaging the opposite end thereof, a manipulating screw carried by said handle adapted to adjust the throw of the lever, substantially as described.

4. The combination in an electric solder-

ing-iron, of a tip member having a solder
passage, a screw connected thereto having a
solder passage therein, a hollow tubular
member abutting said screw, an outer casing
5 surrounding said tubular member, said cas-
ing having a tubular inner casing cast inte-
gral with the outer wall, a resistance coil
carried between said outer and inner casings,
a handle mounted upon said tubular mem-
10 ber, non-combustible packing contained
within said handle and surrounding said

tubular member, a detachable cap carried by
said handle, a valve carried by said screw
adapted to shut off the flow of solder, a
spring mounted upon said handle and acting 15
upon said lever for normally holding said
valve closed, a manipulating screw carried
by said lever adapted to adjust the throw of
the lever, substantially as set forth.

In testimony whereof I hereunto affix my 20
signature.

HARRY H. HARRIS.