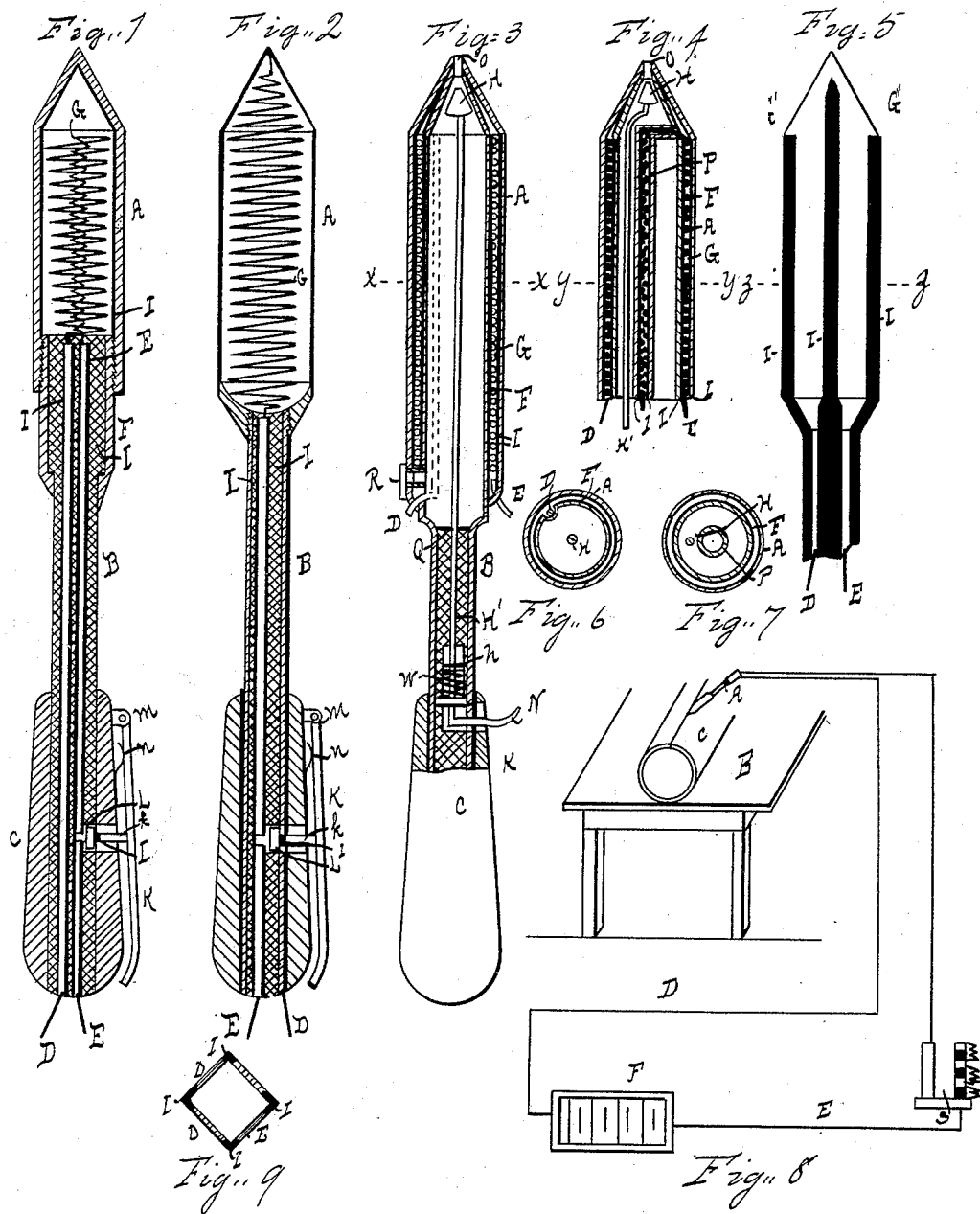


(No Model.)

C. L. COFFIN.
ELECTRIC SOLDERING IRON.

No. 431,439.

Patented July 1, 1890.



Witnesses
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CHARLES L. COFFIN, OF DETROIT, MICHIGAN.

ELECTRIC SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 431,439, dated July 1, 1890.

Application filed January 18, 1890. Serial No. 337,299. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. COFFIN, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful
5 Improvement in Electrically-Heated Soldering-Irons, of which the following is a specification.

My invention consists in an electrically-heated soldering-iron hereinafter fully described and claimed.

Figures 1, 2, 3, and 4 are longitudinal central sections, the shank and handle being broken away in Fig. 4. Fig. 5 is a top plan view of a portion of the shank and iron. Fig.
15 6 is a section on line *x x*, Fig. 3. Fig. 7 is a section on line *y y*, Fig. 4. Fig. 8 is a diagram showing the operation of the tool. Fig. 9 is a section on line *z z*, Fig. 5.

In all the figures, A represents the soldering iron or head proper, which is usually made of copper and pointed at its end.

B represents the shank of the soldering-iron secured thereto in any convenient way, and C represents an ordinary wooden handle.

25 In Fig. 1, D and E represent conductors which extend through the shank, being insulated from each other and provided with binding-screws at the end of the handle C for the attachment of the electric circuit.

30 G represents a spiral conductor contained within the soldering-iron A, (insulated therefrom,) which extends from the conductor D down nearly to the end of the head A and returns to the conductor E. A convenient way
35 in which to make this conductor G is to make it in spirals of two different diameters, as shown in the drawings, whereby one leg of the conductor returns within the other leg. In whatever form this conductor G be made
40 it is intended to be a conductor of higher resistance than conductors D and E, so that it will become heated by the passage of an electric current. The conductor E is shown broken at the point L, and K represents a lever pivoted at *m* to the handle, provided with a spring
45 *n* and carrying a block *k*, which, when pressed into contact with the conductor E, completes the said conductor by bridging the break.

I represents insulating material in all the
50 figures.

In Fig. 2 the arrangement differs from that of Fig. 1 only in that the conductor G is con-

nected with the head A of the soldering-iron at the point thereof, the return being through the soldering-iron and the shank B, the iron
55 and shank taking the place of the conductor D.

Fig. 3 represents a reservoir soldering-iron, in which the spiral conductor G is coiled around the interior of the head A, but insulated therefrom, and is lined with refractory
60 insulating material—such as mica—on the inner surface, thereby leaving a reservoir for solder. The solder is passed into the reservoir through an opening in the side of the head, closed with the screw-cap R, and is put
65 in either in a melted condition or divided into bits which will pass through the opening, or by being pushed into said opening in the form of a wire. In this form F represents the inner wall of head A, and Q represents a diaphragm which shuts off the soldering-head
70 from the shank. H' represents a rod which passes through the head of the soldering-iron and through the diaphragm Q, and is provided at its end with a plug H, adapted to close an
75 aperture O in the point of the head. *h* represents a shoulder on rod H', between which and a shoulder in the shank is a coil-spring *n*, tending to normally press the plug H against the aperture in the end of the head. N represents a thumb-piece on the end of rod H',
80 passing out through a slot in handle C, by which the plug H can be retracted to permit molten solder to flow through aperture O.

The arrangement of Fig. 4 differs from that
85 of Fig. 3 only in that the conductor D is connected directly with the outer spiral conductor G, and the return to conductor E is made by an inner spiral, as in Fig. 1. This throws the reservoir to one side of the center, and the
90 rod H' is therefore curved near its end to bring the plug H in the center of the head, as shown in the drawings.

In Fig. 5 the soldering-iron and shank is itself divided into conductors D and E by hav-
95 ing its corners made of insulating material I, the circuit being closed by the point of the head. The arrangement of the insulating material is illustrated in Fig. 9.

Fig. 8 is a diagrammatic illustration of the
100 soldering-iron as applied to soldering a pipe, the current being derived from a secondary battery F, and is drawn to illustrate the use of the resistance-coil S, which I prefer to use

in one of the conductors E, as shown in the drawings, though it may be D, and which applies to all the figures, though only illustrated in Fig. 8.

5 When the conductors D and E are connected with the poles of a generator of electricity and a current is passed through them, the conductor G, being of comparatively high resistance, becomes heated, thereby heating the
10 head A, which is used as an ordinary soldering-iron. When the reservoir-iron, as shown in Figs. 3 and 4, is used, the solder becomes heated and flows through the aperture O in the head. When the iron is constructed as
15 shown in Fig. 5, the comparative difference of resistance of the different parts of the circuit varies less than with the construction in the other drawings, and a greater heating-current is required to heat the iron.

20 The form of the conductor G may be very widely varied, it only being essential that that part of the circuit which is within the head A or soldering-iron proper and intended to give a heating effect, be of greater electrical resistance than the other parts of the
25 circuit. Except when the reservoir-iron is used, the head A or soldering-iron proper may

be filled with a non-conducting, heat-retaining, refractory material, such as clay, soapstone, &c.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A soldering-iron having a hollow head, an electrical circuit extending into the head, and that part within the head being of comparatively high resistance, a hole in the point of the head, and means for opening and closing said hole at will, substantially as shown and described.

2. A soldering-iron consisting of a hollow head, a conductor of high resistance within said head and having its ends adapted to be connected with the poles of a generator of electricity, and a lining of refractory non-conducting material inclosing the circuit within the head, an opening at the point of the tool, and a valve for controlling said opening, whereby the interior of the tool is adapted as a reservoir for melted solder, substantially as shown and described.

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Witnesses:

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