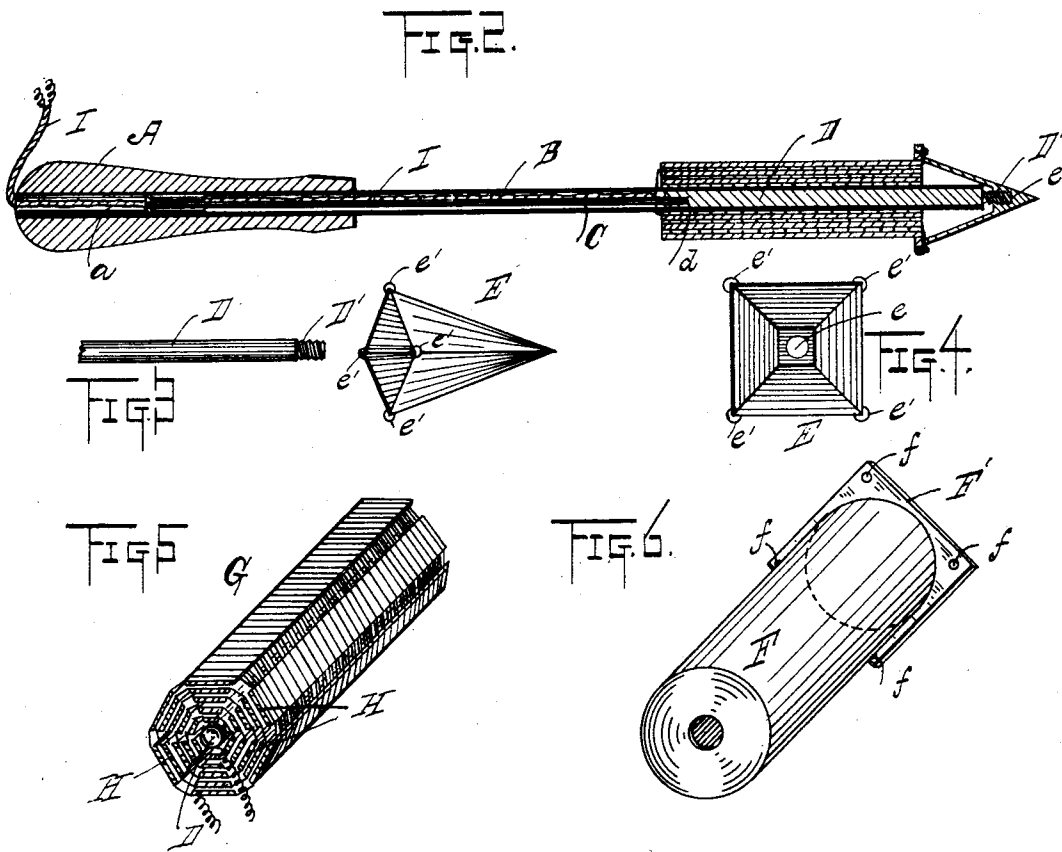
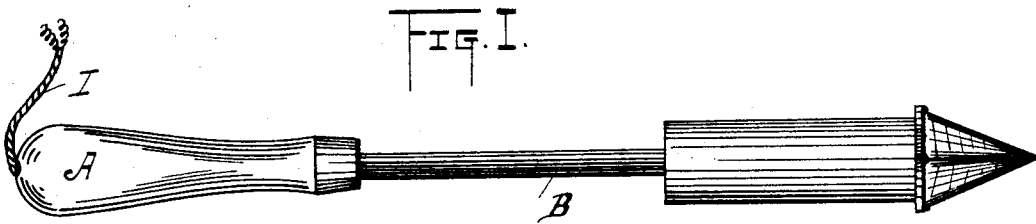


(No Model.)

W. MITCHELL.
ELECTRIC SOLDERING IRON.

No. 460,978.

Patented Oct. 13, 1891.



WITNESSES

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ELECTRIC SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 460,978, dated October 13, 1891.

Application filed January 9, 1891. Serial No. 377,235. (No model.)

To all whom it may concern:

Be it known that I, WILLIS MITCHELL, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Soldering-Irons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide an improved soldering-iron heated by electricity, the same being compact and easily handled, yet having the wires coiled in successive concentric insulated layers, which are located in a hollow shell at or near the point, the electric connections being all internal and protected.

In the accompanying drawings, Figure 1 represents a side elevation of a soldering-iron embodying my invention. Fig. 2 represents a longitudinal section of the same. Fig. 3 represents in detail perspective the point and the screw-threaded part to which it is normally attached, the two being shown slightly separated. Fig. 4 represents a detail rear elevation of the hollow point. Fig. 5 represents the heating-coils and insulating-strips in detail perspective, and Fig. 6 represents the casing for inclosing and protecting the same.

A designates the handle of the tool, having a central longitudinal passage *a*. B designates a tubular stem set into the forward end of this passage. C designates a metallic stiffening and connecting rod attached to said handle within said passage and extending forward through the same and through said tubular stem. Its forward end fits into a recess *d* in the rear end of a stem or rod D, which may be solid, as shown, or tubular, and is aligned with the tubular stem B, so as to constitute in effect an extension thereof. The contiguous ends of the said parts C and D may be welded or otherwise permanently secured together, as indicated, or screw-threaded, and thus fastened, if preferred. The other end of rod D has a screw D' formed on it, which is adapted to take into a screw-tapped recess *e* in the tip of the hollow point E, the

screw entering said recess from within said point. The corners at the base of the latter are provided with eyes *e'*, corresponding in position to eyes or holes *f* in a flat front plate F', formed with or rigidly attached to a cylindrical casing F, which is sleeved on the rod or stem D. The office of this casing is to inclose the wire coils or helices G, which are wound concentrically about said stem or rod with strips of slate or other insulating material H between them. These coils or helices are continuous, being formed by winding a single wire first about the rod D, then back outside of a row or layer of said insulating-strips, then forward again outside of another layer of them, and so on until a sufficient number of helices have thus been formed, one outside of another. This winding practically forms a heating-cylinder, which is in an electric circuit, the wire being led backward from it in two parallel lines, which are insulated from each other and inclosed in a cord I. This cord is carried back through the tubular part B and the handle A, it being side by side with the rod C. Thus all parts of the wire are inclosed in the soldering-iron except from the point where it extends out in cord I at the rear end of the handle A, and thence to the source of electricity.

The operation is as follows: The current of electricity passing about the rod D, near the point E, in the successive coils or helices G, will generate sufficient heat, owing to the resistance of the wire and perhaps to other and less familiar causes, to raise the temperature of the point E sufficiently for soldering. The iron is then used like any other tool of the same general kind.

The wire of the coils or helices G is wound so as to leave a slight interval between each two, thus preventing short-circuiting and securing the best results whether the wire be coated with insulating material or not. I prefer to have it naked, as shown.

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

1. In an electric soldering-iron, the combination of a wire forming part of an electric circuit and wound in concentric helices, which are separated by strips of insulating material,

with an inclosing casing for said helices and a soldering-point in proximity thereto, so as to be heated thereby, substantially as set forth.

2. In combination with handle A, having
5 passage *a*, the tubular stem B, fitted into said passage, the rod or stem D in alignment therewith, a fastening for said parts B D, a casing F, sleeved on said rod D, a heating-cylinder
10 composed of coils or helices of wire wound on insulating material and arranged within said casing, and a cord inclosing the wire leading from the beginning and end of said cylinder, the said cord extending out through said tool,
15 so that all parts of the wire are protected, and the said wire being made to form part of an electric circuit, for the purpose set forth.

3. A wire forming part of an electric circuit and wound into a series of helices constituting a heating-cylinder, in combination

with a soldering-iron constructed with tubular parts inclosing the said wire, and a central rod connected to the point and the handles, substantially as set forth.

4. In combination with the casing F, having a front plate F', an electric heater inclosed in said casing, a point E, bolted to said plate and internally screw-tapped, as shown, a rod screwing into said head, a handle, connections between said handle and rod, and wires running from said heater to a source of electric-
30 ity, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIS MITCHELL.

Witnesses:

ROBERT W. SCOTT,
L. L. PARSONS.