(No Model.)

F. H. HARRIMAN.

ELECTRIC SOLDERING IRON.

No. 594,872. Patented Dec. 7, 1897.

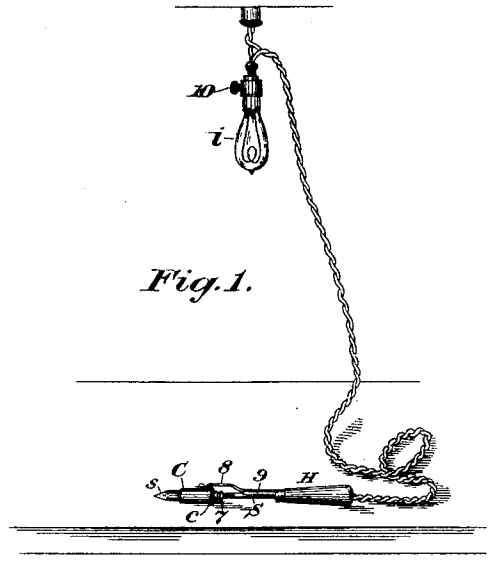


Fig. 1.

Fig. 2.

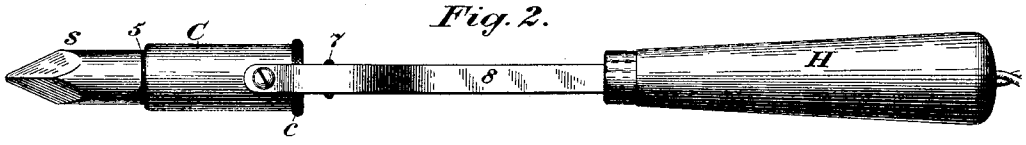


Fig. 3.

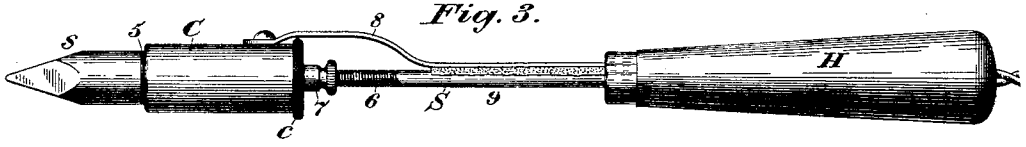


Fig. 4.

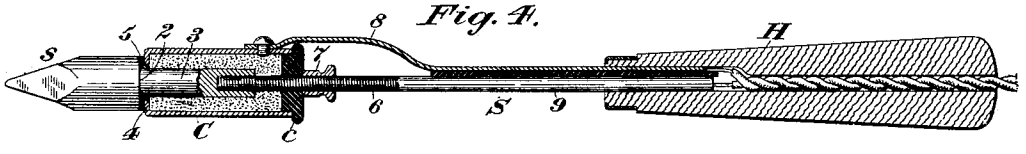


Fig. 5.

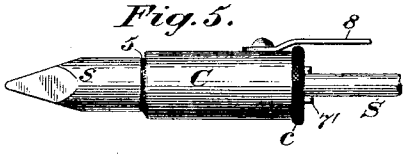
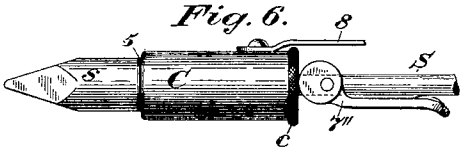


Fig. 6.



Witnesses:
F. L. Edwards Jr.
C. W. Smith

Inventor:
Frank H. Harriman.
By his Attorney,
F. H. Richards.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK H. HARRIMAN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO HENRY GREEN, OF SAME PLACE.

ELECTRIC SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 594,872, dated December 7, 1897.

Application filed April 17, 1897. Serial No. 632,565. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. HARRIMAN, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Electric Soldering-Irons, of which the following is a specification.

This invention relates to electric soldering-irons; and it has for its main object the provision of an improved tool of this class in which the soldering-head will be heated by contact with a circumjacent mass of pulverized or comminuted carbonaceous material of high resistance interposed between the terminals of the circuit in which the soldering-head is included, which material will become highly heated or almost incandescent on the passage therethrough of a suitable current.

In the drawings accompanying and forming part of this specification, Figure 1 is a view illustrating my improved soldering-iron in an ordinary incandescent-lighting circuit including also an incandescent lamp. Fig. 2 is an enlarged side elevation of the soldering-iron detached. Fig. 3 is a side elevation of the same as viewed from the under side in Fig. 2. Fig. 4 is a longitudinal sectional side elevation of the same. Figs. 5 and 6 are detail side elevations illustrating modifications of my invention which will be hereinafter described.

Similar characters designate like parts in all the figures of the drawings.

My improved soldering-iron embodies as its essential features a soldering-head the stem of which is inclosed in a shell or casing containing a filling of pulverized or comminuted carbonaceous material in contact with such stem, the shell constituting one terminal of the circuit to the soldering-head and the soldering-head the other terminal, while the carbon interposed between these two members forms a non-conductor of high resistance, which will be heated up almost to incandescence by the passage of a current therethrough and by the conduction of the heat through the stem of the soldering-head will adapt the latter for use. In the preferred construction the inner end of the shell is closed by a cap, which may be removed to permit the renewal of the powdered carbonaceous material, this cap being supported, preferably, on the shank of the tool, so as to slide thereon, and the shank will be connected to the stem of the soldering-head, which will be of reduced cross-section, so as to form a shoulder against which the outer end of the shell may abut, and thus form a stop between which and the cap the shell may be clamped or held firmly in place.

Referring first to Figs. 1 to 4, inclusive, *s* designates in a general way the head of the soldering-iron, having a shoulder 2, formed by a stem 3 of reduced cross-section. This stem is internally screw-threaded at its inner end, so as to permit connection thereof with the corresponding externally-screw-threaded end of the usual shank S of the iron, which shank at its outer end will be connected to a suitable handle, such as H.

The shell or sleeve which forms one of the terminals or electrodes of the circuit and in which the comminuted carbonaceous material is contained may be of any suitable construction and will be of conducting material. This shell is illustrated at C and is in this case a substantially cylindrical tubular sleeve having an internal flange 4 at the outer end thereof through which the stem 3 of the soldering-head is passed. The diameter of the opening inclosed by this flange is somewhat greater than the diameter of the stem 3, in order that the stem may be inserted into and held within the shell without making contact therewith. For the purpose of preventing this contact, and consequent short-circuiting, I provide at 5, between the stem and the flange 4, a ring of suitable high-resistance insulation, which may be of any preferred kind.

The inner end of the shell or sleeve C is preferably open and may be closed by means of a cap—such, for example, as that shown at *c*, which has a central opening therethrough to permit it to slide on the shank S, which will preferably be circular in cross-section. The cap *c* will also be formed from insulating material of high resistance—such, for example, as hard rubber—in order to prevent contact between the shank S and the shell C. This shank, as before stated, is screw-threaded, as shown at 6, and on this screw-threaded portion I prefer to mount a clamping-nut 7,

by means of which the cap *c* may be held firmly against the open inner end of the shell and clamp the latter securely between the shoulder 2 and said cap, to thereby maintain all of the parts in their proper positions and prevent falling out of the finely-powdered carbon.

The shank S is held in place in a longitudinal bore of the handle H, as shown in Fig. 4, and is connected to one of the circuit-wires. The other wire of the circuit is in this case connected to a conducting-strip 8, preferably of copper, insulated from the shank S by suitable insulating material 9—such, for instance, as a strip of asbestos—and this conducting-strip 8 is connected at its forward end to the shell C of the tool, the other end of the copper strip being held within the bore of the handle H.

The carbonaceous material which I prefer to employ within the shell C as the medium for heating the soldering-head is finely-powdered or comminuted charcoal or carbon dust, which will pack tightly around the stem 3 of the soldering-head and fill the space within the casing or shell C. It will be obvious that as this material is of high resistance it will be heated to a high temperature by the passage of a proper electric current therethrough, and hence by the conduction of this heat through the stem 3 the working end of the soldering-head will be heated for use. A current suitable for this tool may be obtained from an ordinary incandescent-light circuit in which is included an incandescent lamp or other suitable resistance, such as *i*. (Shown in Fig. 1.) The circuit to this lamp and to the soldering-iron should be controlled by means of the usual snap-switch 10, carried by the socket of the lamp.

In Figs. 5 and 6 I have illustrated two modifications of the means for holding the cap *c* in place. In the first of these figures I make use of a key or wedged-shaped pin 7′, passed through a transverse aperture in the shank S, while in Fig. 6 I employ a cam-lever 7″, also supported on the shank S, the locking and unlocking action of which will be obvious. Any other suitable means may of course be employed for holding the cap *c* in place.

My improved soldering-iron constitutes a very simple and efficient implement of this type and one in which there are no delicate parts to adjust or wear out. Moreover, it will be clear that the destruction of the high-resistance carbon filling between the terminals of the circuit does not destroy the usefulness of the tool, but that, on the contrary, the filling may be renewed as often as desired and the tool used until the metallic parts thereof are worn out or destroyed.

Having described my invention, I claim—

1. In an electric soldering-iron, the combination of a soldering-head constituting one terminal of an electric circuit; a conducting-shell surrounding and insulated from the stem of said soldering-head and filled with a comminuted carbonaceous material and constituting the other terminal of the circuit; and a handle connected with said soldering-head.

2. In an electric soldering-iron, the combination of a soldering-head constituting one terminal of an electric circuit; a conducting-shell open at its inner end and surrounding and insulated from the stem of said soldering-head and filled with a comminuted carbonaceous material and constituting the other terminal of the circuit; a removable cap for closing the inner end of said shell; and a handle connected with said soldering-head.

3. In an electric soldering-iron, the combination of a soldering-head having a stem of reduced cross-section and constituting one terminal of an electric circuit; an externally-screw-threaded shank secured to said head; a conducting-shell open at its inner end and surrounding and insulated from the stem of said soldering-head, and filled with a comminuted carbonaceous material and constituting the other terminal of the circuit; a removable insulating-cap mounted on said shank for closing the inner end of the shell; and holding means for securing said cap in place.

4. In an electric soldering-iron, the combination of a soldering-head having a stem of reduced cross-section and constituting one terminal of an electric circuit; an externally-screw-threaded shank secured to said head; a conducting-shell open at its inner end and surrounding and insulated from the stem of said soldering-head and filled with a comminuted carbonaceous material and constituting the other terminal of the circuit; a removable insulating-cap mounted on said shank, for closing the inner end of the shell; and clamping means on said shank, for holding said cap in place and clamping the shell between the cap and the shoulder of the soldering-head.

FRANK H. HARRIMAN.

Witnesses:
WM. H. BLODGETT,
HEATH SUTHERLAND.