No. 680,580. Patented Aug. 13, 1901.

F. FOUCHÉ.

SOLDERING TOOL.

(Application filed Sept. 15, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 4.

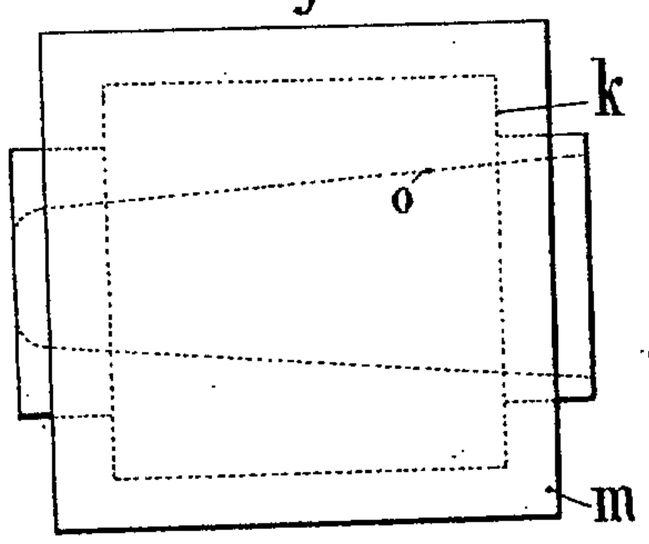


Fig. 5.

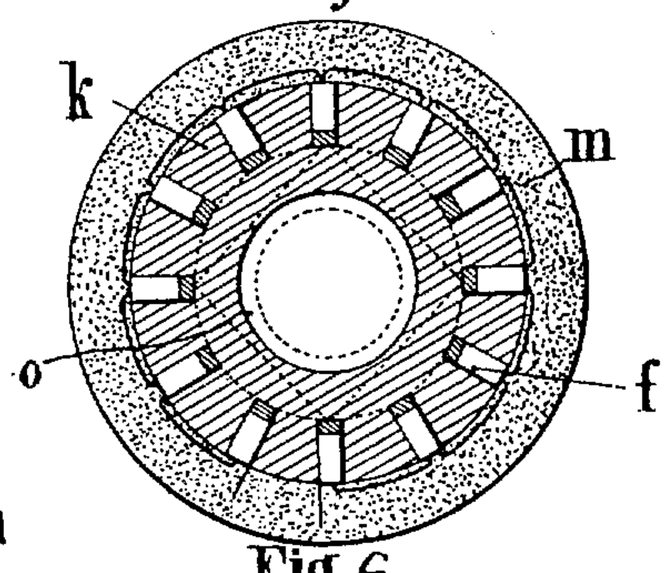


Fig. 6.

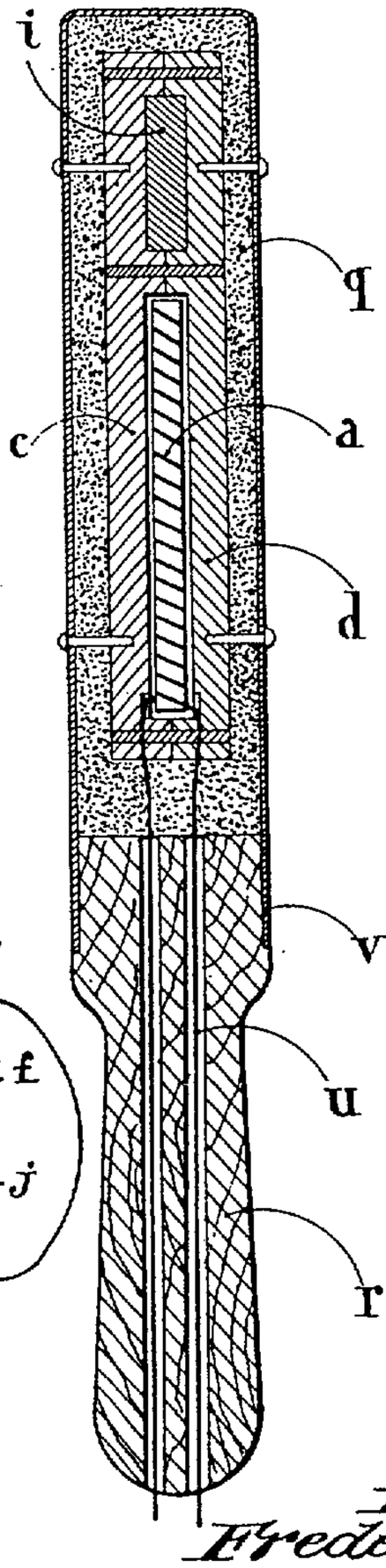


Fig. 7.

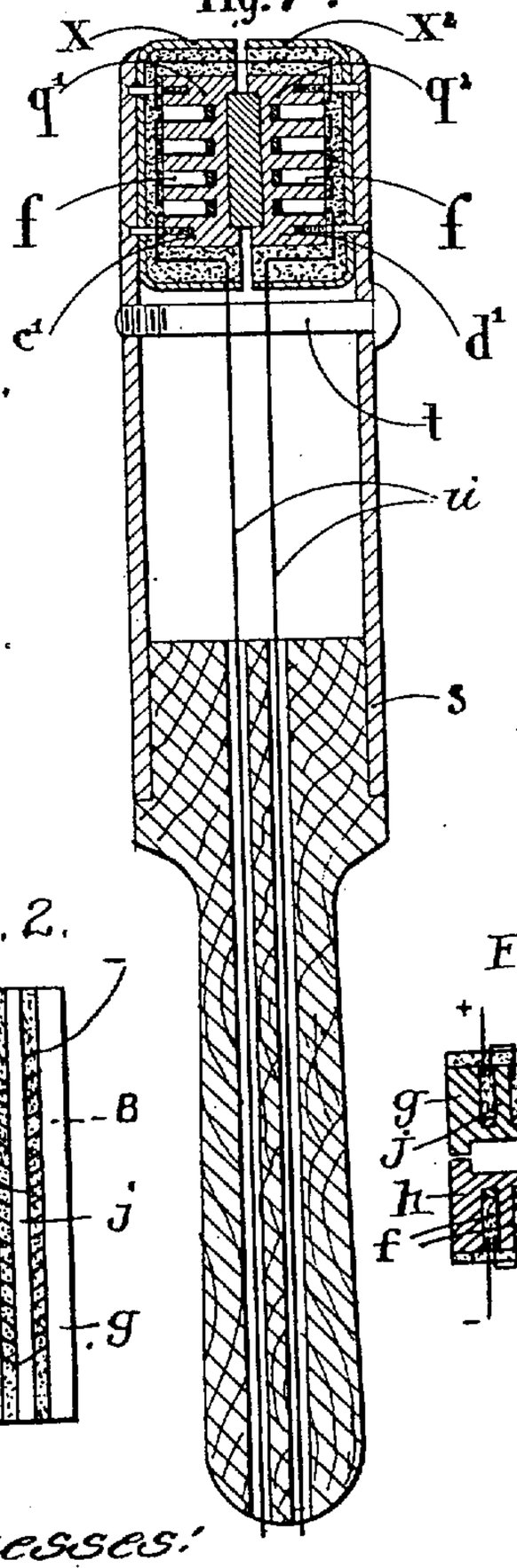


Fig. 1.

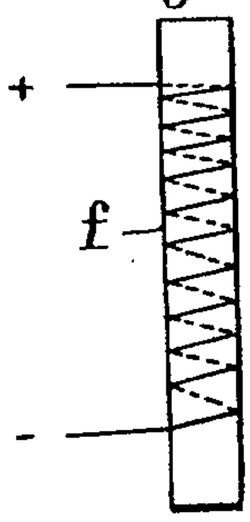


Fig. 2.

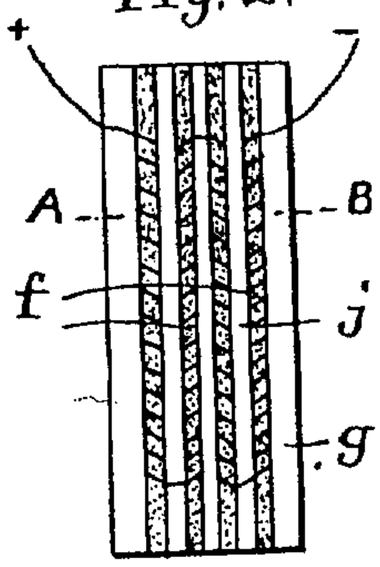
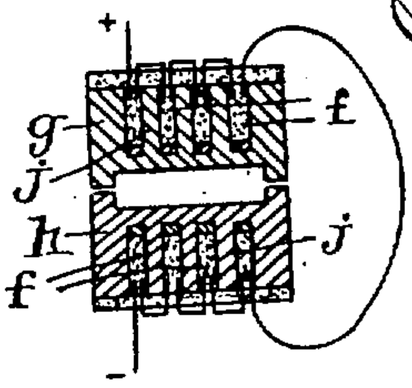


Fig. 3.



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No. 680,580. Patented Aug. 13, 1901.

F. FOUCHÉ.

SOLDERING TOOL.

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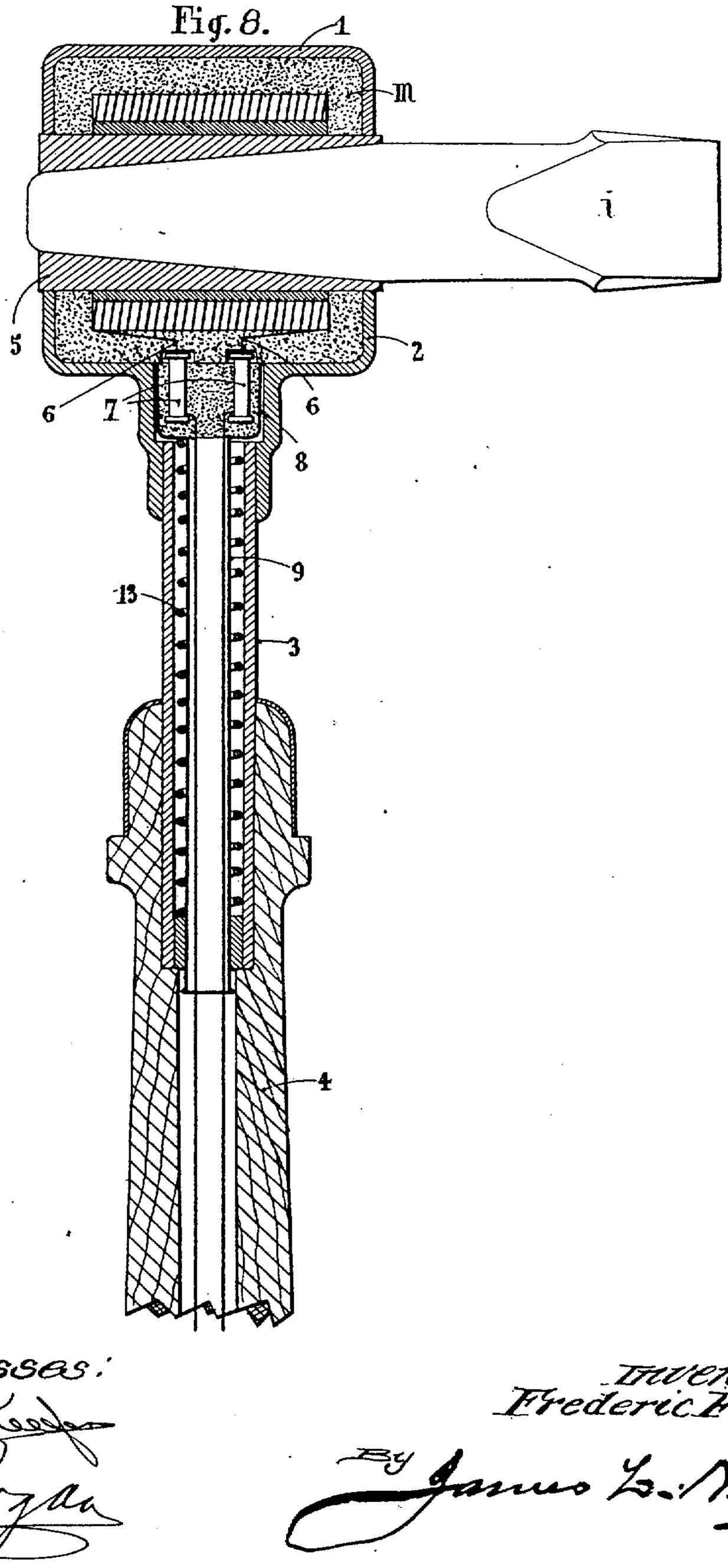
(No Model.) 3 Sheets—Sheet 2.

Fig. 8.



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No. 680,580. Patented Aug. 13, 1901.

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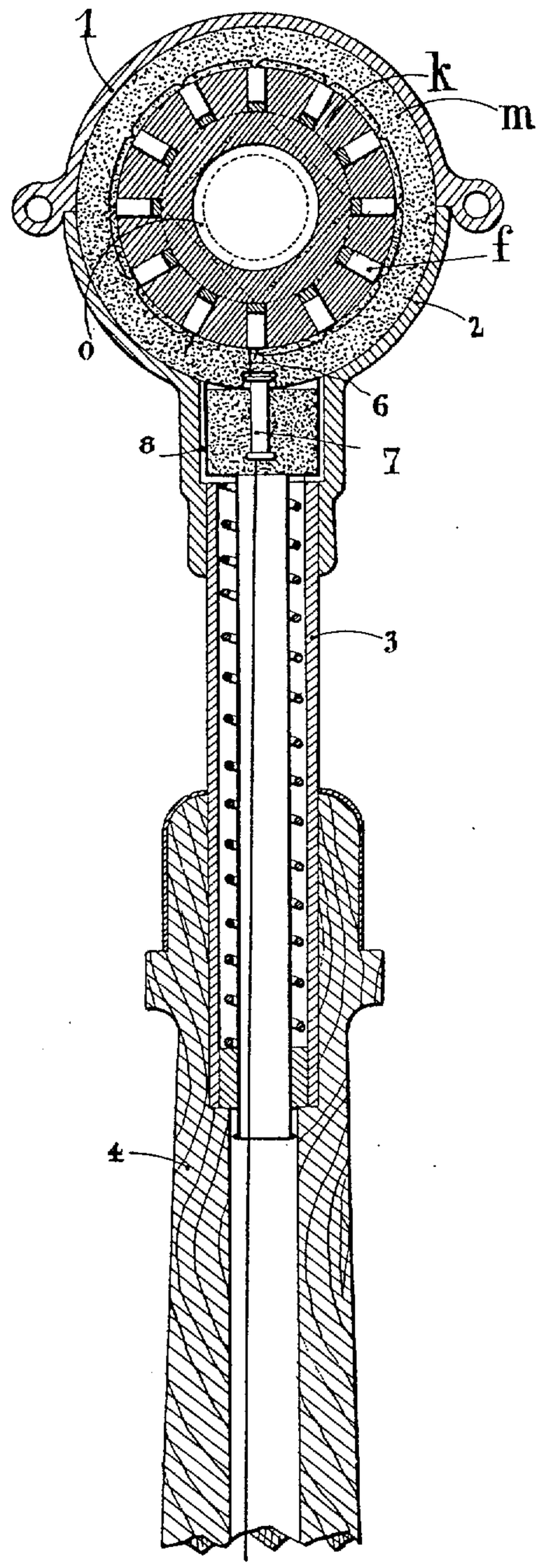
SOLDERING TOOL.

(Application filed Sept. 15, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 9.



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UNITED STATES PATENT OFFICE.

FRÉDÉRIC FOUCHÉ, OF PARIS, FRANCE.

SOLDERING-TOOL.

SPECIFICATION forming part of Letters Patent No. 680,580, dated August 13, 1901.

Application filed September 15, 1900. Serial No. 30,190. (No model.)

To all whom it may concern:

Be it known that I, FRÉDÉRIC FOUCHÉ, engineer, a citizen of the French Republic, residing at Paris, France, (whose post-office address is 38 Rue des Ecluses, St. Martin, in the said city,) have invented certain new and useful Improvements in Soldering-Tools, of which the following is a specification.

This invention relates to certain new and useful improvements in electrical soldering-tools; and the object thereof is to construct a soldering-tool which shall be extremely simple in its construction, strong, durable, efficient in its operation, and comparatively inexpensive to manufacture; and it consists of the novel combination and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of the specification, wherein like reference characters indicate corresponding parts throughout the several views, and in which—

Figure 1 represents an electrothermic block used in connection with my soldering-tool. Figs. 2 and 3 are respectively a side elevation and a cross-section of an electrothermic block comprising two parts, in which the elements are arranged in straight lines used in connection with my soldering-tool. Figs. 4 and 5 are respectively a side elevation and a cross-section of an electrothermic block, showing a circular arrangement thereof. Figs. 6 and 7 illustrate sectional elevations of soldering-tools in accordance with my invention. Figs. 8 and 9 are respectively a longitudinal and a cross section of a soldering-tool in accordance with my invention.

Fig. 1 represents a flat bobbin or resistance; and Figs. 2 and 3 represent, respectively, in side view and cross-section through the line A B an electrothermic block furnished with this resistance. In this arrangement the constituent resistances *f*, which are formed by a wire wound on a small flat plate of insulating and incombustible material, are placed within grooves in the heat-conducting casing, consisting of metal blocks *g* and *h*, and coupled together in series or in parallel and insulated from the blocks *g* and *h*, between which the soldering-bit *i* is tightly gripped. The wire becomes heated by the current passing through it, and the heat is transmitted to the soldering-bit *i* through the medium of the metal blocks *g h*.

Instead of using a heat-conducting casing of rectangular section it may be of other section, such as cylindrical, the electrothermic block being made to correspond, as represented in Figs. 4 and 5. In this case the heat-conducting casing consists of a cylindrical metal block *k*, wherein grooves similar to those in the blocks *g* and *h*, Fig. 3, are formed for the reception of the resistances *f*, which are, as before, insulated from the metal block and connected either in series or in parallel to the current-supply wire. The whole should be surrounded by an insulating-cover *m*. In the axial line of the block *k* there is provided a conical channel *o*, passing through it from end to end, in which engages a corresponding conical end on the soldering-bit. The advantage of this conical or tapering shape is that it renders the soldering-bit capable of being very readily fitted in position and removed without a set-screw being required, and, furthermore, it serves to insure effective contact, and consequently reliable transmission of heat, between the grooved metal block and the soldering-bit.

In Fig. 6 a flat coil *a* is inclosed in the heat-conducting casing formed of two sections *c d*. These latter are inclosed in a case of insulating and incombustible material *q*, secured to the handle *r* of the tool by help of a casing *v*. *u* represents the wires by which the current is brought into the resistances.

In the arrangement shown in Fig. 7 *f* represents the elementary resistances or flat coils, which are connected in series or parallel and inclosed in the heat-conducting casing formed of two metallic sections *c' d'*, surrounded by a case of insulating and incombustible material *q' q²*. This latter is provided with a metal-protecting hull *x x'*. The whole arrangement is attached to the handle *r* of the tool by means of detachable flexible plates *s*, which may be moved toward each other by the screw *t*, so as to cause the sol-

dering-bit to be tightly gripped between the cases c' d'. The current is brought to the resistance by a wire u.

Figs. 8 and 9 represent in sections at right angles to each other and in side elevation, respectively, a mode of fitting the cylindrical electrothermic block (shown in Figs. 5 and 6) to the tool, so as to be readily detachable for renewal of deteriorated parts. In this arrangement, as in that shown in Fig. 5, k represents the heat-conducting casing, f the resistances connected in series or in parallel, i the soldering-bit, o the central tapering channel, and m the insulating material surrounding the grooved metal block. In order to rapidly fit up an electrothermic block composed of these parts, I inclose it in a metal case, consisting of two parts 1 and 2, connected by hinge knuckles and pins and with a boss by which it is secured to a metal tube 3, which is inserted into the handle 4 of the tool. Rotary motion is prevented by the square or equivalently-formed parts 5, which engage in corresponding openings in the case 1 2. In order to insure permanent and strong contact at the current-supplying parts when the heat-conducting casing is fitted in position, I arrange a double spring contact-piece 7 in contact with the terminals 6 of the resistance-coils. The said double contact-piece 7 is situated within the cup 8 at the top of a tube 9 in the rod 3. Between the two parts 3 and 9 is a coiled spring 13, which pushes the cup 8 and the tube 9, fastened to it, toward the hinged case 1 and 2, so that when the electrothermic block is put in place in the case 1 2 the terminals 6 will be pressed against the contact 7 and the spring 13 will be compressed and its reaction will insure proper contact.

For the exchange or removal of an electrothermic block it is only necessary to open the hinged case 1 2, remove the block therefrom, and put another in its place.

The current is not sent into the resistances of the electrothermic block suddenly, as happens where a contact-breaker only is employed, but it first enters a variable rheostat whereof the contact-piece is operated by means of a hand-screw, so that the current only acquires its intensity gradually and, conversely, cannot be suddenly cut off. This arrangement insures a greater durability for the resistances of the electrothermic blocks and enables the heating of the soldering-tools to be controlled and varied as required.

The metal block wherein the resistances are placed should be made of nickel, which does not become sensibly oxidized at the temperature at which soldering-tools operate. The soldering-bit should also be of nickel, so as to avoid its oxidation or its becoming dissolved in the tin. Hence it will be unnecessary to hammer or file it. The soldering-bit may, if desired, be made in one with the metal of the electrothermic block.

As the grooves of the electrothermic block are intended to increase the temperature-exchanging surface, they may be replaced by channels bored in the substance of the block and containing resistances.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting with said bit for connecting the same to a tool-handle, and an electrothermic block for heating the said bit, inclosed in the said casing and separated by the latter from said bit.

2. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting with said bit for connecting the same to a tool-handle, and an insulated electrothermic block for heating the said bit, inclosed in the said casing and separated by the latter from said bit.

3. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting with said bit for connecting the same to a tool-handle, and an insulated incombustible electrothermic block for heating the said bit, inclosed in the said casing and separated by the latter from said bit.

4. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting with said bit for connecting the same to a tool-handle, an electrothermic block for heating the said bit, inclosed in the said casing and separated by the latter from said bit, and wire connections attached to said block and insulated from said means.

5. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting with said bit for connecting the same to a tool-handle, an insulated electrothermic block for heating the said bit, inclosed in the said casing and separated by the latter from said bit, and wire connections attached to said block and insulated from said means.

6. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting therewith for connecting the same to a tool-handle, and an electrothermic block mounted at each side of said bit for heating the same, inclosed in the said casing and separated by the latter from said bit.

7. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting with the bit for connecting the same to a tool-handle, and a separate series of suitably-connected electrothermic blocks for heating the bit, inclosed within said casing and separated by the latter from said bit.

8. In an electrical soldering-tool, the combination with a soldering-bit, of a heating conducting-casing contacting with the bit for

connecting the same to a tool-handle, and a separate series of suitably-connected, insulated electrothermic blocks for heating the bit, inclosed within said casing and separated by the latter from said bit.

9. In an electrical soldering-tool, the combination with a soldering-bit, of a heat-conducting casing contacting therewith for connecting the same to a tool-handle, and a series of electrothermic blocks mounted in the said casing, separated by the latter from said bit and adapted to heat the latter.

10. In an electrical soldering-tool, the combination with a soldering-bit, of a pair of heat-conducting casings contacting with the said bit for connecting the same to a tool-handle, and a series of electrothermic blocks for heating the said bit, inclosed in the said casings and separated by the latter from the said bit.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRÉDÉRIC FOUCHÉ.

Witnesses:
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HIPPOLYTE JOSSE.