J. T. GRIFFIN.

ELECTRIC SOLDERING IRON.

APPLICATION FILED JAN. 3, 1916.

1,250,856.

Patented Dec. 18, 1917

2 SHEETS—SHEET 1.

Fig. 1

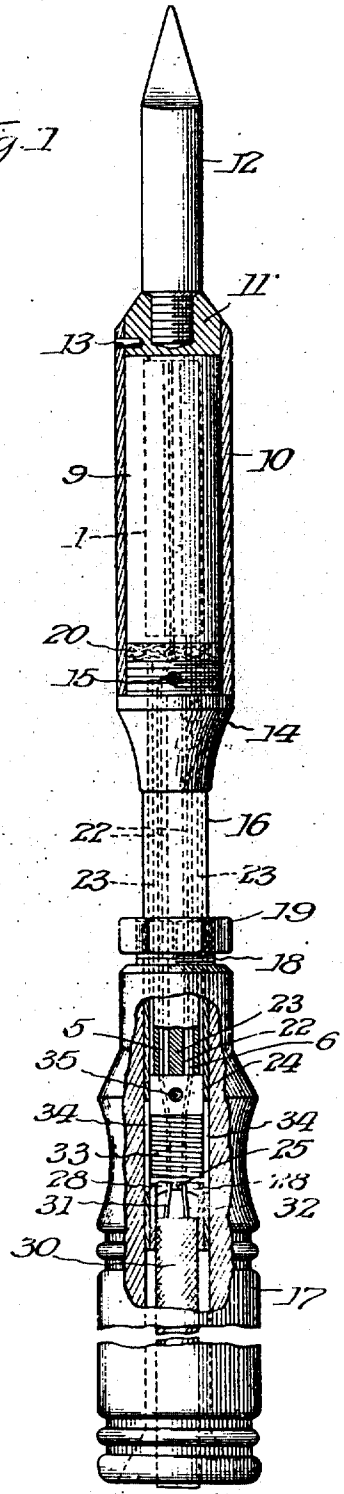


Fig. 3

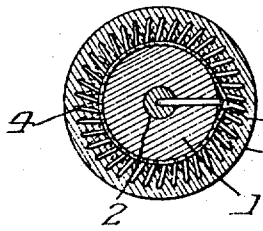
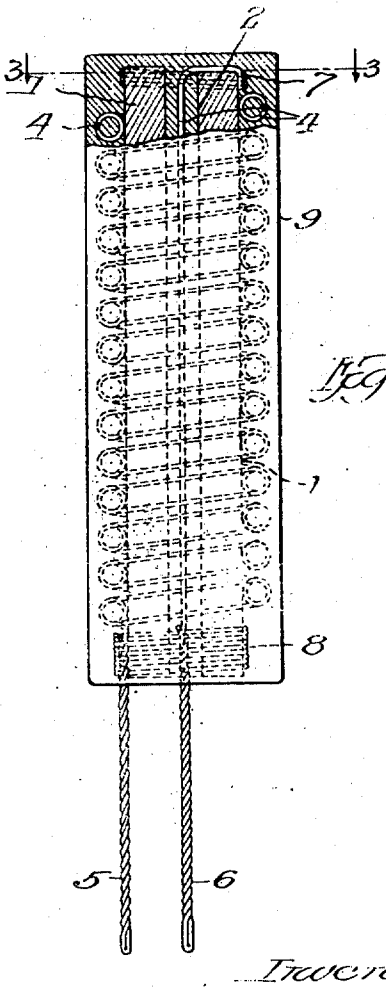


Fig. 2



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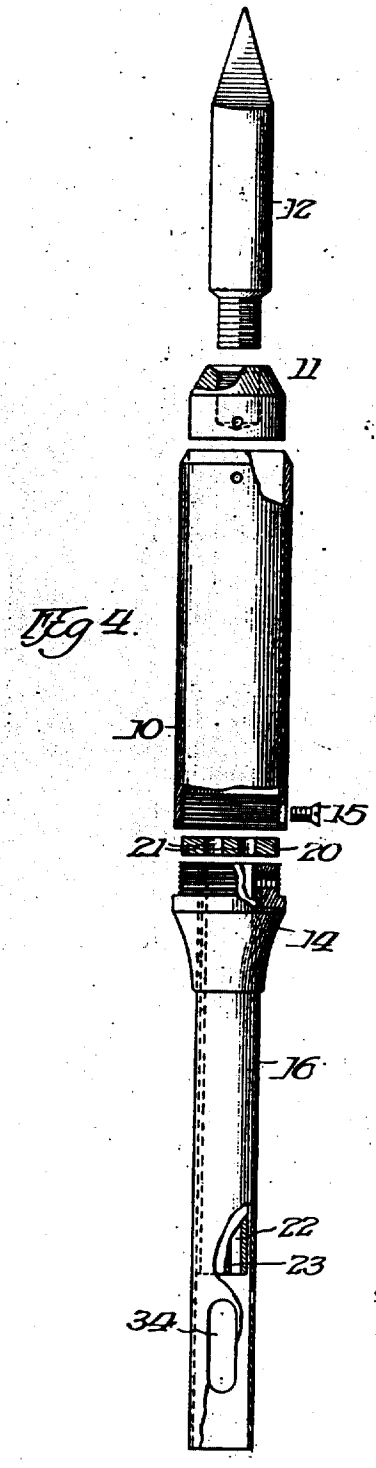


Fig. 4.

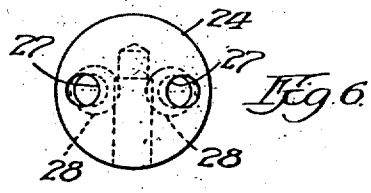


Fig. 6.

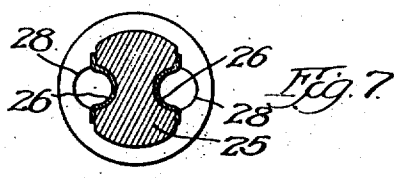


Fig. 7.

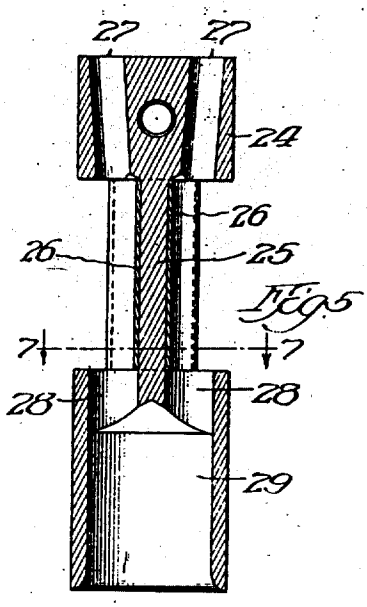
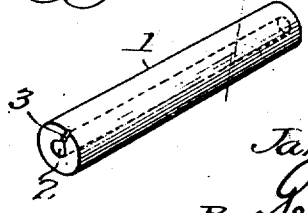


Fig. 5.

Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES T. GRIFFIN, OF OAK PARK, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTRIC SOLDERING-IRON.

1,250,856. Specification of Letters Patent. Patented Dec. 18, 1917.

Application filed January 3, 1916. Serial No. 70,007.

To all whom it may concern:

Be it known that I, JAMES T. GRIFFIN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Soldering-Irons, of which the following is a full, clear, concise, and exact description.

This invention relates to improvements in electric soldering irons.

The object of the invention is to provide a soldering iron made up of readily separable parts, one of which parts is a heating unit of inexpensive construction, whereby the heating unit may be removed from time to time if burned out, or a unit of different wattage may be substituted for the one in use, with a minimum of delay and expense.

The soldering iron illustrated in the accompanying drawings will serve to disclose one embodiment of the invention. Figure 1 is an elevation thereof partly in section. Fig. 2 is an enlarged elevation, partly in section, of the heating unit. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is an elevation, partly in section, of certain parts of the soldering iron detached from each other. Fig. 5 is an enlarged sectional elevation of one of the inclosed parts. Fig. 6 is an end elevation thereof. Fig. 7 is a section on the line 7—7 of Fig. 5. Fig. 8 is a perspective view of the insulating core.

The heating unit for the soldering iron is provided with a core 1 of any suitable refractory insulating material, various mixtures of cement being well adapted for this purpose. Said core has a central opening 2 therethrough and a notch 3 in one end. The resistor consists of any suitable material, preferably in the form of a wire 4, which is wound into a helix with a straight length on each end, and the helix thus formed is then wound around the core 1, as shown in Fig. 2, to form a large helix. The individual turns of the small helix are out of contact with each other and the turns of the large helix are similarly spaced apart to prevent contact. One of the straight lengths of the resistance wire is passed through the notch 3 and then through the opening 2, whereby it is maintained out of contact with the helices. Both ends of the wire are preferably doubled back on themselves and twisted to form terminal conductors 5 and 6 of greater size, strength and conductivity than the intermediate portion of the wire constituting the helices. The ends of the core are wrapped with asbestos strips 7, 8 to hold the resistor in place temporarily. In order to permanently hold the turns of the helices in fixed spaced relation and to properly protect them, they are embedded in cement. This is done by introducing cement into a mold in which the core, having the resistance wire wound thereon, is placed. The finished product has the appearance of a cylinder 9, made of refractory insulating material, from which the terminal conductors 5 and 6 protrude, the original core 1 being completely inclosed. The heating unit thus formed is efficient, durable and of inexpensive construction.

The heating unit, in the form of soldering iron illustrated, fits within a metal shell 10, the heat being conducted through the end plug 11 of said shell and the copper tip 12 secured therein. Said plug has a driving fit within said shell and is positively held in place by a plurality of pins 13. The other end of the shell receives the screw-threaded end of thimble 14 and is secured by a set screw 15. Said thimble is brazed on to a piece of metal tubing 16. The handle 17 of standard construction may be fitted over the other end of the tube 16. It is provided with a split sleeve 18, projecting from the end thereof, and clamped down upon said tube 16 by a nut 19.

A washer 20 of asbestos or other suitable insulating material is located within the shell 10 between the heating unit and the head 14 (Fig. 4), and has a pair of openings 21 therein. The terminal conductors 5 and 6 pass through said openings and through a pair of alined openings 22 in an insulating cylinder 23 located within the tube 16. Contact between said conductors is thus prevented.

Beyond the cylinder 23, a spool of insulating material 24 is located. This spool, as shown in Fig. 5, has a reduced middle portion 25, having a pair of grooves in its opposite faces within each of which fits a sheet metal channel 26. These channels communicate with a pair of openings 27, passing through one end of the spool and with a second pair of openings 28 passing through the other end thereof, which lead to a recess 29, the latter being adapted to receive the end of the usual flexible cord 30 con-

taining two conductors 31, 32. Said conductors pass through the openings 28 and meet the terminal conductors 5 and 6 which pass through the openings 27. The ends of the respective conductors are soldered to the sheet metal channels 26, and may be soldered to each other, the joints being thereafter wrapped with asbestos string 33, as shown in Fig. 1. The lower end of the tube 16 is provided with a pair of oppositely disposed openings 34, arranged just over the points where the conductors are soldered together. These openings facilitate the unsoldering of the wires when it is desired to renew the heating unit, as the tip of a soldering iron can be introduced through said openings. The spool 24 and the cord 30 are arranged to slip loosely within the tube 16, whereby said spool and associated parts may be drawn out of the upper end of said tube to facilitate the soldering or unsoldering of the wires, when the screw 35, which holds said spool in place within said tubing, is removed. Said openings are used only in case it is difficult to withdraw said parts, in which case the unsoldering may be effected without said withdrawal.

With the construction described, it will be seen that by simply removing a set screw the casing 10 may be unscrewed and removed, and the heating unit rendered accessible by pulling the terminal conductors and other associated parts out of the end of said tube. The wires may then be quickly unsoldered and the new unit substituted. A little cement may be used when the unit is being inserted in its case, to fill any slight clearance space that may exist, thereby reducing the heat potential drop. The expense of the original unit is so slight that if it burns out it is simply discarded and a new one substituted. The substitution may also be effected where it is desired to change the soldering iron to one having a different wattage for a different class of work.

The soldering iron may also be used as a branding iron, by substituting for the tip 12 a suitable heat conducting extension carrying the raised letters or figures which it is desired to imprint on the object to be branded. One important illustration of such use is that wherein the characters are branded on the hard rubber ends of the spools on which coils are wound, in telephone practice. Various other uses are contemplated. Hence the invention is not limited to a structure intended primarily for soldering, but should include all such as are adapted to apply heat more or less locally where the heat is generated by an electrical heating unit readily replaceable within its heat conducting container.

What is claimed is:

1. A soldering iron, comprising a length of tubing, a spool therein having elongated grooves, openings in said spool at the ends of said grooves, a detachable casing at one end of said tubing, a heating unit removably mounted therein, conductors extending from said heating unit through one end of said spool into said grooves, and external conductors passing through openings in the other end of said spool into said grooves and joined to said first conductors.

2. A soldering iron, comprising a heat conducting casing, a heating unit removably mounted therein, tubing extending from said casing, a handle thereon, a spool within said tubing, an insulating cylinder within said tubing, said spool and cylinder having alined openings, conductors extending from said heating unit through said openings, external conductors passing through said handle and through further openings in said spool and soldered to said first conductors, said tubing having a pair of openings arranged over said soldered connection to provide access thereto when the handle is removed, and means for clamping said handle in place.

3. In an electric soldering iron, a spool of insulating material having a pair of openings in opposite ends, a pair of grooves in the intermediate portion of said spool, and metal channels fitting said grooves.

4. A soldering iron comprising a heat conducting casing, a heating unit removably mounted therein, a plug mounted in one end of said heat conducting casing and having a tip positioned therein, said heating unit comprising a substantially centrally apertured core having a notch therein, a helix of resistance wire wound thereon, one end of which is adapted to be caught by said notch and to extend through the aperture in said core to form a terminal, the other end of said wire extending from the outer circumference of said core adjacent the first mentioned end thereof to form a second terminal, means wound around opposite ends of said core to secure said resistor in place, and a covering of molded plastic insulation completely covering said elements and contacting with said heat conducting casing and said plug to conduct heat to said tip.

5. In an electric soldering iron, a handle, a heat conducting casing, a plug provided with a tip positioned in one end of said casing and a heating unit mounted within said casing and contacting with the walls thereof and with said plug to conduct heat to said tip, said heating unit comprising a centrally apertured core having a notch therein, a helix of resistance wire wound thereon in helical form, one end of said wire being adapted to be caught by said notch and to extend through said aperture, means wound around opposite ends of said core to secure said resistor in place, and a covering of

molded plastic insulation completely covering said wire and said core and extending through said aperture.

6. A soldering iron, comprising a length of tubing, a handle thereon, a spool therein having elongated grooves, a casing at one end of said tubing, a heating unit mounted therein, conductors extending from said heating unit into the grooves in said spool, external conductors extending into said grooves and joined to said first conductors, and openings in said tube arranged over said grooves to provide easy access to the joined ends of said conductors when said handle is removed.

In witness whereof, I hereunto subscribe my name this 29th day of December, A. D. 1915.

JAMES T. GRIFFIN.