J. L. NILSSON.

SOLDERING IRON.

APPLICATION FILED JUNE 6, 1910.

1,043,963.

Patented Nov. 12, 1912.

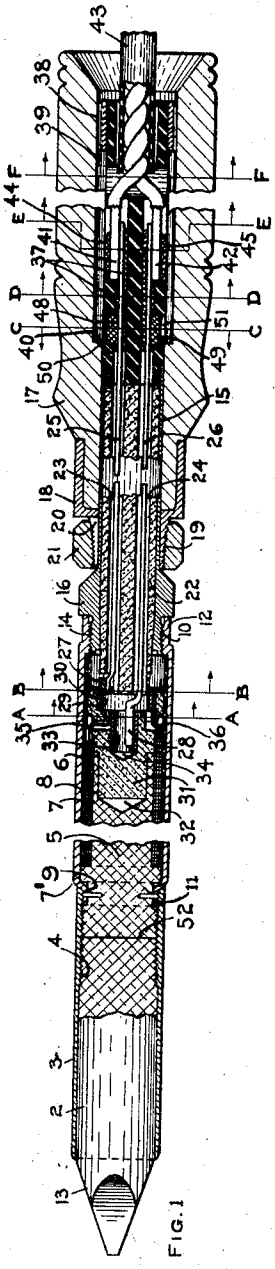

FIG. 1

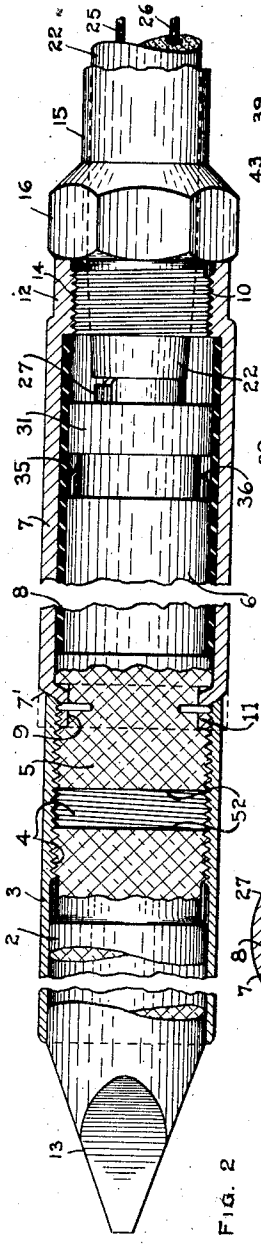

FIG. 2

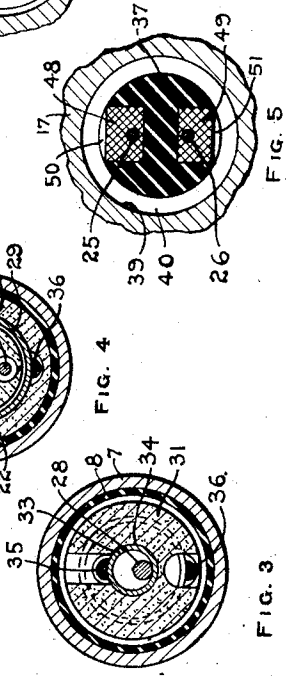

FIG. 3

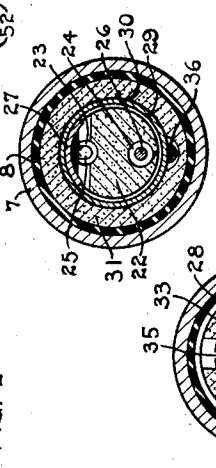

FIG. 4

FIG. 5

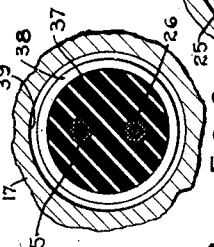

FIG. 6

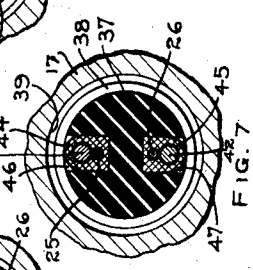

FIG. 7

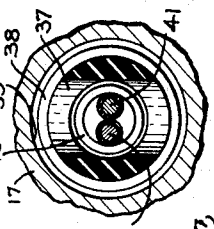

FIG. 8

WITNESSES:

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SOLDERING-IRON.

1,043,963. Specification of Letters Patent. Patented Nov. 12, 1912.

Application filed June 6, 1910. Serial No. 565,422.

To all whom it may concern:

Be it known that I, JOHAN LUDVIG NILSSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Soldering-Irons, of which the following is a specification.

My invention relates to soldering irons and has particular reference to the electrically heated type thereof.

The object of the invention is to provide an improved construction of interchangeable resistance coils or heat units which may be attached to and removed from the body of the tool in a simple quick and convenient manner, and whose size or dimensions are not limited by the size or dimensions of the body of the tool, so as to adapt the tool to different voltages of current; to provide improved means for protecting the joint between the copper tip or nose and the heat coil against damage by the soldering acids; to facilitate separation and adjustment of the different parts of the tool; to provide an improved contact between the core of the heat coil and the tip; to reduce cost of construction and obviate the necessity of removing interior parts in readjusting the tool for varying conditions of service; to provide a construction which does not necessitate the displacement or disturbance of the heat unit in exchanging tips; to provide a spring for the terminals far enough in the rear of points of contact with the heat coil to prevent damage thereto from the heat of the core and coil, and to strengthen and improve the tool generally throughout.

With the above-named objects in view my invention consists in the new and improved construction, arrangement and combination of parts, hereinafter described in detail, illustrated in the accompanying drawing and particularly pointed out in the appended claims.

In the drawing—Figure 1 is a longitudinal section through a tool embodying my invention. Fig. 2 is an enlarged view of the body of the tool broken away and partly in section, core and tip slightly separated. Fig. 3 is a section on line A—A of Fig. 1. Fig. 4 is a section on line B—B of Fig. 1. Fig. 5 is a section on line C—C of Fig. 1. Fig. 6 is a section on line D—D of Fig. 1. Fig. 7 is a section on line E—E of Fig. 1. Fig. 8 is a section on line F—F of Fig. 1.

Referring in detail to the several views, 2 represents the tip or nose. This is held in a casing or tubular portion 3, the inner end of which is interiorly threaded at 4. These threads are engaged by corresponding threads on the inner end of the tip, said inner end being thus well within the casing 3 and removed from the working or tapered portion or point of the tip so as to protect the joint from damage by the acids used in soldering. The same threads 4 are engaged by threads on the forward end of a heat-core 5 on which the coil is wound. The coil 6 is incased by a shell 7 and between said shell and the core-windings or coil is a layer of insulation 8. In the forward end of the core 5 is a circumferential groove or channel 9 into which the shell 7 is spun as shown at 11 which makes an air and acid tight junction between the core and shell and the spun offset also lends additional strength to the heat unit comprising the core, coil and shell. At its rear end the shell has a reduced portion 10 which has interior threads that engage exterior threads on the rear end 12 of the casing 7. The rear end reduction 10 of the shell 7 lends that end additional strength and rigidity in the same manner as the reduction 9 strengthens the forward end.

The shell 7, which incases the tip, extends to the tapered portion 13 of said tip and when the point 13 needs re-shaping it may be ground down together with the forward end of the shell without thereby interfering with the threaded connection between tip and core at 4.

The heat unit, comprised of the shell 7 and its contents, forms an exterior section of the tool which may be attached and removed quickly by turning its threaded connections 4 at the forward end and a similar threaded connection 14 at its rear end, or at the forward end of a stick, stem, or tube 15 which has threaded engagement with the rear end of the shell 7. The stem or tube 15 has a square or octagon nut portion 16 immediately in the rear of its threaded portion at 14. On the stem 15 is mounted a handle 17 which is provided with a ferrule 18 which has a reduced or nipple portion 19 that is tapered forwardly and split at 20 so that it may be contracted on the stem. On the threaded portion 19 of the ferrule is mounted a nut provided with a tapered bore corresponding to the taper on the nipple and having threaded engagement with the latter. As this nut is advanced on the threaded por-

tion 19 same is gradually contracted and clamped as tightly as may be desired on the stem 15. By loosening the nut 21 the handle 17 may be adjusted toward or away from the tip 2 to vary the working length of the tool.

Within the stem 15 is a cylinder of lavite 22 longitudinally through which extend bores 23 and 24 containing conductor wires 25 and 26. These bores are larger than the wires so as to permit lateral play of flexing of said wires throughout a considerable distance of their lengths and prevent damage to their flexibility by reason of the heat at the contact or electrode ends 27 and 28 of said wires. The electrode or contact-end 27 is connected with one end of the coil 6 on which end is a ring 29 seated in a bore 30 of a lavite plug 31 held in a bore 32 in the rear end of the copper core 5. Said contact end 27 is in the form of a segmental or laterally curved plate as is shown in Fig. 4. The ring 29 forms the terminus for one end of the coil, while a similar ring 33 inserted in a smaller bore 34, forms the other end of the coil. The end of one of the stem wires is of spindle form as shown in Fig. 3 and connects with the ring 33. The end of the core winding or coil which is connected with the ring 29 is indicated at 35, while the opposite end of the coil connecting with the ring 33 is indicated at 36 in Fig. 1.

At the handle, or rear, end of the lavite tube 22 is placed a fiber plug 37. On the rear or free end of this plug is mounted a ferrule or ring 38 which protects and strengthens the exposed end of the fiber plug and is made of larger diameter than the plug so that the inner rim of the ring forms a stop. The handle is counterbored at 39 so as to provide a recess in which this ring or ferrule may move, and the inner end of this counterbore or recess forms a shoulder or stop 40 which serves as a stop to limit the outward adjustment of the handle 17 on the stem so that said handle may not be adjusted backwardly far enough to expose the connections 41 and 42 of the fixture-cord 43 and make it possible to accidentally short-circuit the electrode ends 41 and 42 of the fixture cord and produce an arc by laying the tool on some metallic substance. This obviates accidental conflagration and damage to the tool. The contact ends 41 and 42 of the fixture cord are fastened to the stem wires 25 and 26 by solderings 44 and 45 poured through openings 46 and 47 extending from opposite sides of the fiber plug and intercepting the bores containing the ends 41 and 42, as shown most plainly in Fig. 7. Said stem wires 25 and 26 are fastened to the stem itself, or the same fiber portion thereof, by means of similar solderings 48 and 49 poured into diametrically opposed openings 50 and 51 which extend into the bores 23 and 24.

The contact between the tip 2 and the core 5 is preferably made by flat, smooth surfaces on the adjacent ends of core and tip, the junction of the parts being indicated at 52. This makes it easy to smoothen or sandpaper off the contacting surfaces and maintain efficient heat conductivity through the parts.

The threads upon the threaded end of the core extend over the reduced or spun-down portion of the sleeve or core and coil casing 7, and a shoulder 7' is formed upon the coil casing or sleeve 7 against which the inner end of the shell or sleeve 3 may be tightly screwed. The soldering acids do not affect the shell surfaces of the joint formed at the shoulder as injuriously as it does copper surfaces.

At 9 and 11 pins are shown engaging the reduced portion of the shell and the core to prevent accidental relative rotation when a wrench is applied to the shell or coil-casing to unscrew the core from the tip.

I claim as my invention—

1. In a soldering tool, the combination with the tip and the heat core, of a shell for supporting said tip and core against each other, said shell having, at its end farthest removed from the point of said tip, means for engaging and holding said tip and core in contact with each other, whereby said shell serves as a casing and support common to both tip and core and protects the joint against exposure to the acids used on said tip.

2. The combination with a soldering tool, of a heat unit consisting of a removable section forming a part of the length of body of said tool, said section comprising a casing containing a core having a coil thereupon insulated from said casing, said core having at its forward end a circumferential groove or channel into which said casing is spun, whereby said end is reduced to strengthen the casing and to form a substantially integral part of the core.

3. In a soldering tool, the combination with the tip and its incasing shell, of a heat unit consisting of a casing forming a section of a body of the tool and containing a core and a coil, said core projecting out of the forward end of said casing and having a circumferential groove at said end, said forward end of the casing being spun down into said groove to form a substantially integral part of said core and to provide a shoulder upon said casing, said spun down portion of the casing and projecting portion of core having threads thereupon, said shell being interiorly threaded to engage the threads upon said casing and core and to have its inner end screwed up closely against said shoulder.

4. In a soldering tool, the combination with a stem, and a grooved copper core having a resistance coil wound thereupon, of an incasing shell for said core, said incasing shell being reduced at its ends and said reduced ends engaging both the groove in said core and said stem, respectively, whereby said core and stem are firmly bound together and the rigidity and strength of said shell increased, continuous threads upon said core and upon the reduced end engaging the core, a soldering tip or nose, and a shell or sleeve having threads which engage the threaded portion of said core and the incasing shell and the threads upon said tip.

5. In a soldering tool, the combination with a core, a stem, a lavite cylinder and a fiber plug, the latter forming the outer end of said stem, said stem having bores therethrough, the wires extending through said cylinder and said bores, the latter being of larger diameter than said wires to permit lateral movement of said wires, means for securing the wires to the handle-end of the tool, and means for connecting said wires with fixture-cord wires.

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

JOHAN L. NILSSON.

Witnesses:
M. C. ALLEN,
J. N. BECKSTROM.