F. KUHN, L. H. THOMAS AND J. G. SPIESS.

ELECTRICALLY HEATED TOOL.

APPLICATION FILED MAY 27, 1920.

1,363,473. **Patented Dec. 28, 1920.**

Fig. 1.

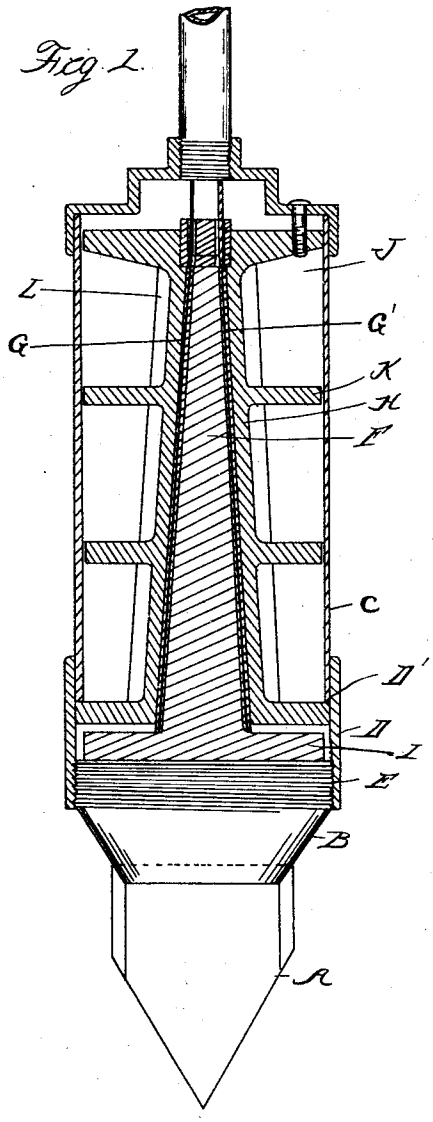
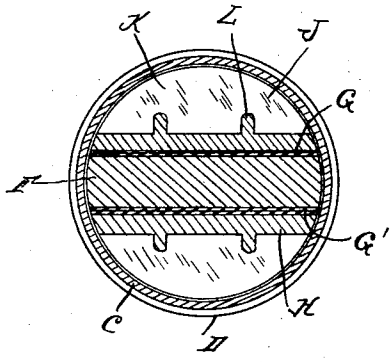


Fig. 2.



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FRANK KUHN, LAWRENCE H. THOMAS, AND JULES G. SPIESS, OF DETROIT, MICHIGAN, ASSIGNORS TO AMERICAN ELECTRICAL HEATER COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

ELECTRICALLY-HEATED TOOL.

1,363,473. Specification of Letters Patent. Patented Dec. 28, 1920.

Application filed May 27, 1920. Serial No. 384,511.

To all whom it may concern:

Be it known that we, FRANK KUHN and LAWRENCE H. THOMAS, both citizens of the United States of America, and JULES G. SPIESS, a citizen of the Republic of France, having taken out first citizenship papers in the United States of America, all residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrically-Heated Tools, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to electrically heated tools of that type in which the tool to be heated is detachably connected to the heating unit so as to permit of removal. It is the object of the invention to obtain a construction in which the heat generated will pass by conduction into the tool in sufficient quantity and at the same time avoiding the over-heating of the generating unit. To this end the invention consists in the construction as hereinafter set forth.

In the drawings:

Figure 1 is a longitudinal section through an electrically heated soldering iron, embodying our invention;

Fig. 2 is a cross-section thereof.

A is the tool to be heated, which is provided with an enlarged shank B terminating in a flat face. C is a cylindrical housing for inclosing the heating unit and which is coupled to the shank of the tool by a portion D having a threaded engagement with said shank, as indicated at E.

Heretofore, constructions of this type have been formed with the heating unit clamped between cylindrical segments and extending longitudinally within the casing C, the ends of said segments being in heat conducting contact with the shank of the tool. The area of the heating unit is thus restricted to the area of the longitudinal section of said cylinder segments and with this, if the heat generation is large, there is danger of attaining a temperature too high to be desirable. We have therefore devised a construction where in place of the area of a single longitudinal section, double this area is attained for the heating unit and all the heat generated will be conducted into a heat-distributing body in direct contact with the shank of the tool. As shown, F is a core member of wedge-shaped form longitudinally of the tool and having flat faces on the opposite sides thereof. G and G′ are two sections of an electrical heating unit arranged on opposite sides of the wedge F and clamped thereto by segmental pressure plates H on opposite sides thereof. The two sections of the heating unit are complete in themselves and the electric current passing therethrough does not pass through the wedge therebetween. The core F at its outer end is enlarged to form a head I which presents an area corresponding to that of the end of the shank B, against which it abuts. The pressure plates H are held in contact with the wedge, first, by their engagement with the housing C, and second, by the wedging action of the core. This is caused by a shouldered engagement D′ between the pressure plates H and the casing C, which, when the threaded portion D is screwed up on the shank B, will move said pressure plates longitudinally. Consequently, said pressure plates will mount the wedge-shaped core F, firmly pressing the units in contact therewith and then transmitting longitudinal movement to the core into the head I thereof, pressing the latter firmly against the shank B. To avoid loss of heat by conduction outward through the pressure plates and radiation from the casing C, said pressure plates are cut away as indicated at J, leaving only narrow annular flanges K for bearing against the housing C. The structure may be also strengthened by longitudinally-extending ribs L.

With the construction as described, when the sleeve D is screwed up, the shank B will be in firm heat conducting contact with the head I and the wedge-shaped core F will be in good heat-conducting contact with the sections of the unit. If the unit is then connected into an electric circuit, the heat generated will be conducted inward into the wedge-shaped member F and then longitudinally to the head I, from which it will pass into the shank B and then to the tool.

What we claim as our invention is:

1. The combination with a tool to be heated, of a separate body extending rearward from said tool, the adjacent ends of said tool and body having corresponding surfaces in contact with each other and said body having a surface extending in a plane

at an oblique angle to its longitudinal axis, a clamping member having a surface parallel to said obliquely inclined surface for a wedging engagement therewith, a heating unit clamped by the wedging engagement of said clamping member and body member, and means connecting said clamping member and tool for effecting a relative longitudinal movement thereof to simultaneously wedge said unit and to press the contacting surfaces of said tool and body together.

2. The combination with a tool to be heated, of a heat-conducting body extending rearward from said tool, the adjacent ends of said tool and body being parallel and in contact with each other and said body having a surface in a plane at an oblique angle to its longitudinal axis, a coöperating member having a parallel oblique surface and forming in connection with said body a clamp, an electrical heating unit secured by said clamp, and means for moving said cooperating member axially of said body relative to said tool to simultaneously clamp the unit and clamp said parallel contacting surfaces of the body and tool.

3. The combination with a tool to be heated, of a member movable longitudinally with respect to said tool provided with an obliquely inclined or wedging surface, a heat-conducting body intermediate said longitudinally movable member and tool having a coöperating oblique or wedge surface and also provided with a transverse surface parallel and in contact with a corresponding surface on the tool, a heating element arranged between the wedge surfaces of said movable member and body, and means for adjusting said movable body relative to said tool to simultaneously clamp the element between said wedge surfaces and to clamp said transverse surfaces of the tool and body in heat-conducting contact.

4. The combination with a tool having a transverse inner end surface, of a heat-conducting body having a corresponding surface in contact with the surface of said tool, said body having a rearwardly extending wedge-shaped portion, a coöperating wedge member, a heating unit arranged intermediate said wedge members, and adjustable means connecting said coöperating wedge member and tool for relatively moving the same to simultaneously clamp said element and said body in heat conducting contact with said tool.

5. The combination with a tool to be heated having a transverse rear surface, of a heat-conducting body having a parallel surface for contacting with said transverse surface of the tool, said body having a rearwardly extending wedge-shaped portion, a coöperating wedge member of segmental cross-section, a tube surrounding said heat-conducting body and coöperating member having a shouldered engagement with the latter to move the same longitudinally, and a peripheral engagement for preventing lateral displacement, said tube having a threaded engagement with said tool, and a heating element between said body and coöperating wedge member clamped by the screwing of said tube toward said tool, said adjustment also clamping the parallel surfaces of said body and tool in contact.

6. The combination with a tool to be heated having a transverse rear surface, of a heat-conducting body having a surface parallel to and substantially co-extensive with said transverse surface, said body being also provided with a rearwardly extending centrally arranged wedge-shaped portion, coöperating wedge members on opposite sides of said wedge-shaped portion and complementary thereto to form a cross-section substantially co-extensive with that of the tool, a pair of heating elements clamped between said coöperating members and the opposite faces of said wedge-shaped portion, and a tube surrounding said coöperating members having a peripheral and end thrust engagement therewith and a threaded engagement with said tool, whereby the screwing of said tube upon said tool will simultaneously clamp said heating elements and the contacting surfaces of said tool and body.

7. The combination with a tool to be heated, of a body extending rearward therefrom, said tool and body having corresponding parallel transverse contacting surfaces and said body being provided with a rearwardly centrally extending wedge-shaped portion, coöperating wedge members upon opposite sides of said central wedge shaped portion, said members being complementary segments of a circular cross-section and cut away to provide a peripheral bearing of limited area, heating elements between the opposite surfaces of said central wedge and said coöperating wedge-shaped members, and a tube surrounding said coöperating members forming peripheral and end thrust contact therewith, said tube having a threaded portion for engaging said tool to provide for simultaneously clamping said heating units and the contacting surfaces of said body and tool.

In testimony whereof we affix our signatures.

FRANK KUHN.
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