Aug. 7, 1923. 1,463,951

F. J. GROVEN

ELECTRICAL HEATING UNIT

Filed Nov. 12, 1920

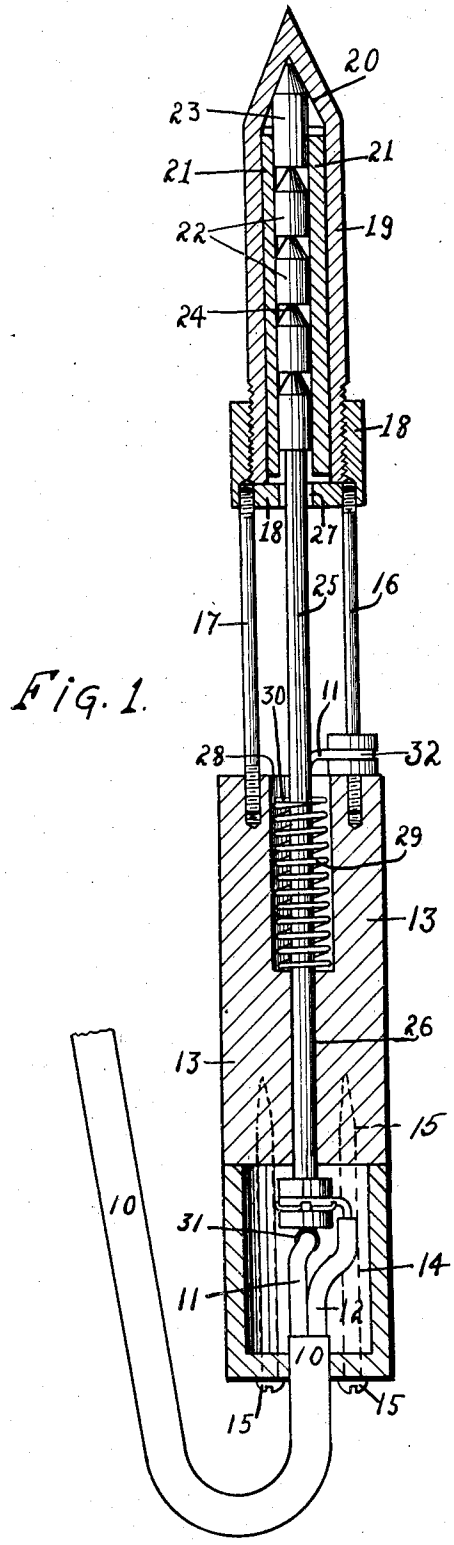


Fig. 1.

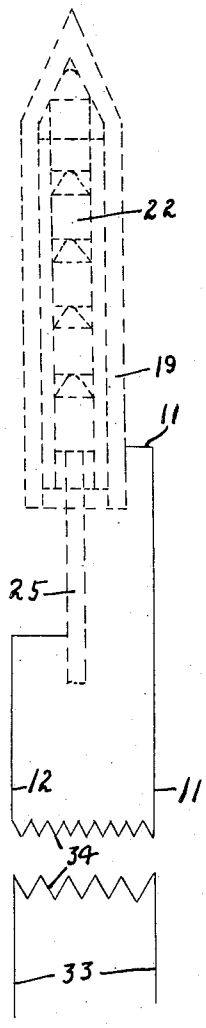


Fig. 2.

WITNESS:
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UNITED STATES PATENT OFFICE.

FREDRICK J. GROVEN, OF HIGHLAND PARK, MICHIGAN, ASSIGNOR TO FORD MOTOR COMPANY, OF HIGHLAND PARK, MICHIGAN, A CORPORATION OF DELAWARE.

ELECTRICAL HEATING UNIT.

Application filed November 12, 1920. Serial No. 423,561.

To all whom it may concern:

Be it known that I, FREDRICK J. GROVEN, a citizen of the United States, residing at Highland Park, in the county of Wayne and State of Michigan, have invented new and useful Improvements in an Electrical Heating Unit, of which the following is a specification.

The object of my invention is to provide an improved electrical heating unit of simple, durable and inexpensive construction.

A further object of my invention is to provide a heating unit of especially compact construction which will give a maximum length of service with a minimum amount of current consumption and a minimum amount of adjustment.

A further object of my invention is to provide a heating unit comprising a bar of material having a high electrical resistance and to insulate this bar of material from the device in which it is installed to thereby permit said device to be heated from the heat generated due to the resistance of said bar.

A further object of my invention is to provide a resistance unit comprising a plurarilty of portions of varying diameters made from material of high electrical resistance whereby the resistance to electrical current may be separated into a number of spaced portions of the unit to thereby spread out the heat generated by the unit over a considerable area.

A further object of my invention is to provide a heating unit comprising a series of pieces of material of high electrical resistance which contact with each other in such a way that the places of contact may be of less cross sectional area than are the remaining portions of the pieces.

A further object of my invention is to provide a heating unit especially adapted for soldering irons or other objects requiring continuous heating for considerable apparatus or time, comprising an insulated sleeve having my improved resistance unit therein, whereby one end of the resistance may be connected with a source of current and the other end grounded into the frame or body of the soldering iron or the like.

A further object of my invention is to provide in such a device means for maintaining the pieces of the heating unit in constant contact with each other.

A further object of my invention is to provide means for insulating the handle of the heated object against the electrical currents and also against the heat generated by the unit.

With these and other objects in view, my invention consists in the arrangement, combination, and construction of the various parts of my improved device, as described in the specification, claimed in my claims, and shown in the accompanying drawings, in which:

Figure 1 is a vertical, sectional view through my improved device, the heating unit being in this instance illustrated as installed in a soldering iron, and .

Figure 2 is a diagrammatic view illustrating the construction and wiring of my improved heating unit.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate, generally, a feed wire for my improved iron, having a pair of current carrying wires 11 and 12 therein. A handle member 13 comprises a solid block of heat insulating material and a cap member 14 of similar material fixed to the end thereof by the screws 15. Screwed into the handle 13 are a pair of rods 16 and 17, which have their remaining ends screwed into cap 18. The cap 18 is internally screw threaded to receive the threaded end of a hollow soldering point 19, which may be of any suitable shape to perform the operation of soldering. In this connection it should be mentioned that while I have shown this heating unit as installed in a soldering iron, it is adapted for heating substantially any form of device which can be heated by electrical means.

The hollow portion or recess of the soldering member 19 terminates in a conical portion 20. The body portion of this recess receives a sleeve 21 of electrical insulating material which extends from position adjacent to the cap 18 to position adjacent to the conical portion 20. Loosely received within the sleeve 21 are a plurality of segments 22 and 23, which form my heating unit and which, in the form here illustrated, are composed of cylindrical pieces of carbon of substantially the diameter of the interior of the sleeve 21 and which have one end tapered to

a point at 24. The end segment 23 is here illustrated as being somewhat longer than then the remaining segments and it fits closely into the conical recess 20, thereby grounding that end of the heating unit into the soldering member.

A push rod 25 is slidably mounted in hole 26 drilled through the handle 13 and has its ends adjacent to said end electrically connected with a wire 12. Sufficient length is allowed for the wire 12 to permit some movement of the rod 26 without tending to fatigue the wire 12 too greatly. The push rod 25 passes through an opening 27 in the central portion of the cap 18 and contacts with the end segment 22 within the sleeve 21. The opening 26 in the handle 13 is enlarged at 28 somewhat to receive a coiled spring 29, which coacts with the bottom of recess 28 and a pin 30 which is fixed in the push rod 25 yieldingly urge said push rod toward said heating unit segments. The wire 11 passes into hole 31 in the side of the cap 14 and continues to position where it may be electrically connected with one or both of the rods 16 at 32. If desired this wire 11 may pass through a hole drilled in the walls of the cap 14 and the handle 13.

In Figure 2 I have illustrated a wiring diagram for use in connection with my heating unit in which the wires 33 lead from a source of electrical energy (not shown) to a transformer 34. From the transformer 34 the wires 11 and 12 lead to the ends of my heating unit.

In Figure 2 I have also illustrated in dotted lines the construction of the soldering iron here shown to better illustrate the connection between the electrical circuit and the heating unit, but it will be understood that I do not intend to limit myself thereby to the use of this heating unit with the particular structure shown. It will also be noted that I do not desire to limit my invention to the particular material here mentioned, carbon, but that any material having substantially the qualities of carbon, i. e., high electrical resistance, may be used in the place thereof. The heating unit need not be composed of a plurality of segments but may be formed of a continuous bar.

I do not desire to limit myself to the particular form of supporting and insulating the heating unit here shown, as other means may be used which may accomplish the same result.

Some changes may be made in the arrangement and construction of the various parts of my improved device without departing from the spirit of the invention therein and it is my intention to cover by my claims such changes as may be reasonably included within the scope thereof.

I claim as my invention:

1. In an electrical heating device, a resistance unit comprising a bar of material of relatively high electrical resistance, said bar having constricted portions therein, and means for establishing an electrical circuit therethrough.

2. In an electrical heating device, a resistance unit comprising a bar of material of relatively high electrical resistance, said bar having constricted portions therein, means for holding said bar from movement, and means for establishing an electrical circuit through said unit.

3. In an electrical heating device, a resistance unit comprising a bar of material of relatively high electrical resistance, said bar having constricted portions therein, a sleeve of electrical insulating material adapted to hold said bar from lateral movement, and means for establishing an electrical circuit through said unit.

4. In a device of the class described, a casing having an opening therein, a sleeve of insulating material within said opening, and a resistance unit comprising a bar having constricted portions and formed from material having relatively high electrical resistance, and means for establishing a circuit through said unit.

5. In a device of the class described, a handle member composed of electrical and heat resisting material, a plurality of supporting rods extended therefrom, a cap member fixed to said supporting rods, said cap member having a central opening therein, a casing detachably secured to said cap, an insulating sleeve within said casing, a resistance unit slidably mounted in said sleeve, a push rod slidably mounted in said handle in position to contact with one end of said resistance unit, and means for yieldingly urging said push rod into contact with said resistance unit to thereby force it into contact with the casing.

FREDRICK J. GROVEN.

Witness:
EDWARD L. DAVIS.