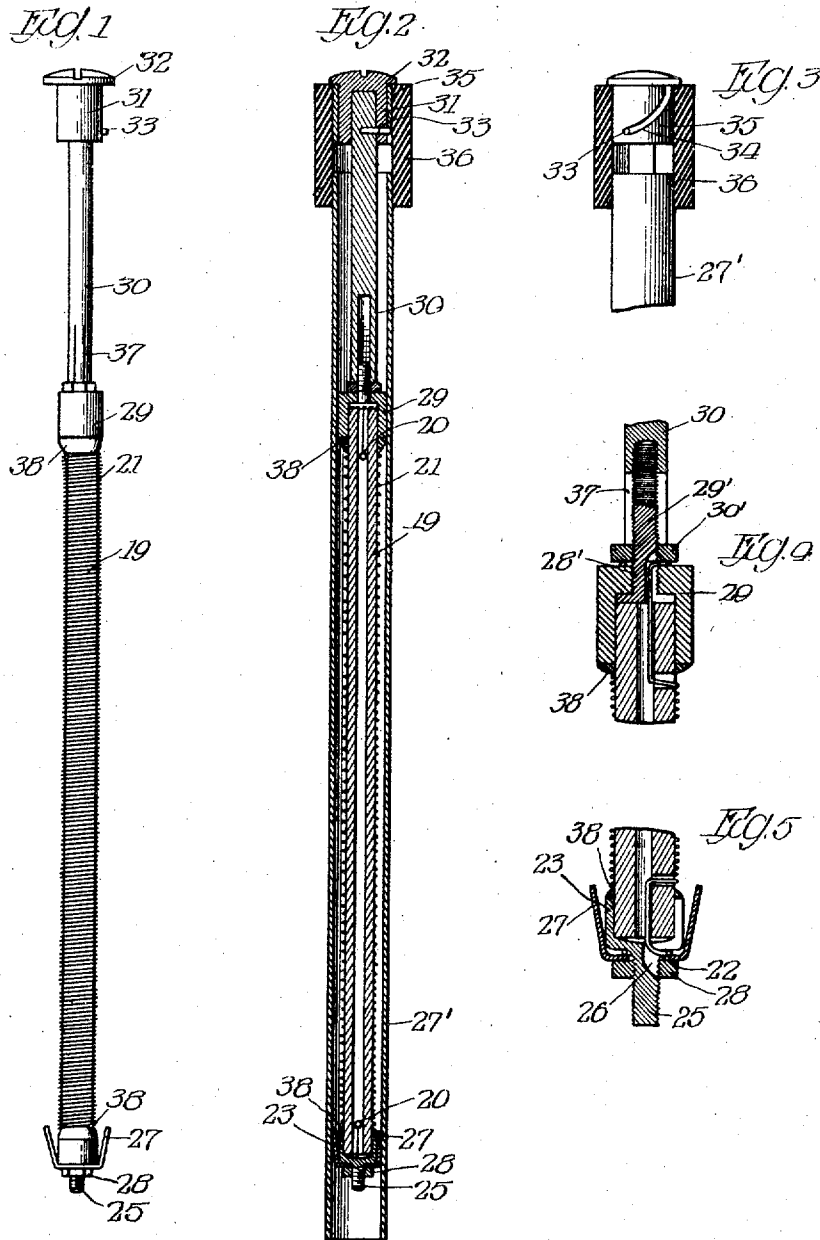


A. DE KHOTINSKY.
ELECTRIC HEATING UNIT.
APPLICATION FILED SEPT. 19, 1914.

1,208,756.

Patented Dec. 19, 1916.



WITNESSES:

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ELECTRIC HEATING UNIT.

1,208,756.

Specification of Letters Patent.

Patented Dec. 19, 1916.

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To all whom it may concern:

Be it known that I, ACHILLES DE KHOTINSKY, 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 Electric Heating Units; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an electric heating unit, the objects of which are to provide simple means for quickly attaching the movable portions of the heating unit in good contacting relation to the circuit terminals; to provide a simple and durable construction of heating units which will readily withstand the required temperatures and in which there will be no losses or excessive heating due to imperfect contacts between the constituent elements; to provide means of compensating for irregularities in the alinement of elements composing the said heating unit, thereby preventing an overstraining or breaking of the insulating portions thereof; and to provide simple means for cementing conducting and non-conducting parts of the heating units to each other so as to prevent a relative loosening of such parts.

Further objects will be apparent from the following specification and from the accompanying drawing, illustrating the preferred embodiment thereof.

In the drawings:

Figure 1 is an elevation of one of the heating units. Fig. 2 is a section through the heating unit and its central terminals. Fig. 3 is a detail, partially in section, of one end of the structure illustrated in Fig. 2, and Figs. 4 and 5 are enlarged sections of portions of one of the heating units.

The heating unit is preferably made of a tube 19 of an insulating material adapted to stand a high degree of heat, the said tube being equipped near each end with a transverse perforation 20. Wound upon this tube is a high resistance wire 21, one terminal of which wire extends through one of the said perforations 20 into the lower end of the tube and presents a free end 22, which free end is brought out through a slot 26 in a metal cap 23 slipped over the said lower end of the insulating tube. As-

sociated with and preferably integral with the said cap 23 is a threaded shank 25 extending through the perforated end of the said cap, the said shank being provided with a continuation of the said slot 26 through which the free end 22 of the wire is passed to permit the end portion thereof to be wrapped around the shank 25 of the bolt. A centrally perforated spring member 27 is then slipped over the shank of the said bolt, whereupon the said end portion of the wire is clamped between the contact member 27 and the adjacent end of the cap 23 by tightening a nut 28 threaded upon the said shank. When in position, the resiliency of the wings of the contact member 27 continuously force the same against the walls of the conducting tube 27' surrounding the tube 19, thereby completing the connection to the circuit which has one terminal grounded to both of the said tubes. Mounted upon the other end of the insulating tube 19 is a cap 29 of insulating material corresponding in outer diameter to the bore of the conducting tube 27', which cap carries a bolt 28' slotted on one side to permit the other end of the said wire 21 to be brought out through the end of the cap, the shank 29' of said bolt being equipped with a nut 30' clamping the adjacent free end of the wire 21. Threaded upon the extreme end of the last-named shank 29' is a partially tubular stem 30 carrying at its extreme upper end a plug 31 equipped with a slotted head 32. Extending radially from the said plug 31 is a pin 33 interfitting a cam slot 34 in a contact cylinder 35 carried by an insulating block 36 mounted upon the tube 27', the cylinder 35 being axially in alinement with (but insulated from) the conducting tube 27' disposed below the same.

It will be evident from Figs. 1 and 2 that the stem 30 together with the head 32 and the cylinder 35 afford a holder or carrier by means of which the tube 19 may readily be manipulated for inserting or withdrawing the latter from its normal position within the conducting tubes 27'. When the tube 19 is thus inserted, the pin 33 will engage the walls of the cam slot 34, so that a partial rotation of the slotted head 32 by means of a screw-driver will firmly interlock the members to prevent an accidental disconnecting thereof, whereupon the wire

21 will be connected to one terminal of the circuit through the wings of the contact member 27 and to the other terminal thereof through a telescopic interfitting of the plug 31 with the contact cylinder 35. In practice, it is usually difficult to insure an axial alinement of the shank 29' associated with the upper cap with the insulating tube, and the consequent strain upon the latter when inserting the same into the conducting tube 27' might tend to fracture the frail insulating tube. I therefore preferably provide the stem 30 with a number of longitudinal slots 37 affording a resiliency which will permit the said stem 30 to be tilted out of alinement with the axis of the shank 29', so as to compensate for any such irregularities.

To fasten the conducting cap 23 and the insulating cap 29 respectively to the insulating tube, I preferably apply a fusible cement to the interior of each of said caps when assembling the parts and thereafter subject each end of the heating element 17 to a sufficiently high temperature to melt the said fusible cement, whereupon the same will produce an interlocked bead 38 effectively and permanently uniting the adjacent parts of the heating unit. It will be evident that by making the cam-slot 34 relatively steep and by extending the same only over a fractional part of the circumference of the contact shell 35, it will only be necessary to impart a fractional rotation to the head 32 of the heating unit, which fractional rotation will not be sufficient to unscrew the stem 30 from the screw 25 coupled thereto. However, this fractional rotation, together with the corresponding longitudinal sliding, will cause the contact member 27 to rub against the bore of the conducting tube 27' so as to insure a clean and firm electrical connection.

It will be evident from Figs. 4 and 5 that the transverse perforations 20 near the respective ends of the insulating tube 19 will permit the ends of the high resistance wire 21 to be brought out through the slotted shanks 25 and 29' of the screw terminals associated with the ends of the said tube.

It will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing any of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim as my invention:—

1. A mounting for an electric heating unit, having exposed terminals, comprising a pair of alined sockets forming circuit connections, and an auxiliary element threaded upon one terminal of the unit and presenting an exposed contact, said contact and the other of said terminals contacting respec-

tively with the said sockets, the said contact and the socket contacting therewith being operatively connected by a screw formation reverse to and of considerably greater pitch than the said threaded connection between the auxiliary element and the unit.

2. An electric heating element including a tube of insulating material, a resistance wire disposed upon the surface thereof, a flexible contact mounted at one end of said tube and connected to one end of said resistance wire, a metal element carried by the other end of said tube and connected to the other end of said wire, a conducting member coupled to said element and connecting the latter to one terminal of the circuit, and means associated with said coupling for permitting a tilting of the said coupling element with respect to the said conducting member.

3. An electric heating unit including in combination with a cylindrical member of insulating material and a resistance wire disposed thereon, a pair of caps mounted on the respective ends of the said insulating element, contact members carried by the respective caps and carried respectively by the ends of the resistance wire, and a set fusible material simultaneously securing each of said caps and the contact member adjacent thereto to said tube.

4. In a heating unit, in combination with a stem of insulating material and a high resistance wire wound thereon, a cap of insulating material slipped over one end of said stem and equipped with a perforation substantially axial of said stem, and a screw of conducting material extending through said perforation and having its head disposed within said cap, the said screw equipped with a slot permitting the adjacent end of the high resistance wire to be brought through the said perforation.

5. The combination with a pair of substantially alined circuit terminals of a heating unit including an insulating cylinder, a resistance wire wound thereon, a pair of contact elements mounted on the respective ends of the cylinder and respectively connected to the ends of said wire, said contact elements normally entering the respective terminals, there being yielding means associated with one of said terminals and the contact entered thereby for compensating a lack of alinement of said contacts and terminals, and means for interlocking the other of said terminals with the contact entered thereby.

6. The combination with a tube and a circuit terminal associated with one end thereof, of a heating unit disposed in said tube and including an insulating cylinder, a resistance wire wound thereon, contact elements mounted on the respective ends of the cylinder and connected to the respective ends of the wire, and an insulating bushing

carried by one end of the cylinder and spacing the adjacent contact from the tube, and a second circuit terminal insulated from said tube and normally contacting with the last named contact, the other of said contacts normally contacting with the first named circuit terminal.

7. The combination with a tube and a pair of relatively insulated circuit terminals presenting contact portions within said tube, of a heating unit including a resistance element shorter than the distance between said contact portions, and a locking element yieldingly connected to one end of the resistance element and detachably interlocked with one of said contact portions.

8. The combination with a tube and a pair

of relatively insulated circuit terminals presenting contact portions within said tube, of a heating unit including a resistance element shorter than the distance between said contact portions, and a locking element yieldingly connected to one end of the resistance element and detachably interlocked with one of said contact portions, and an insulating bushing carried by the said element and spacing the said end thereof from the tube.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

ACHILLES DE KHOTINSKY.

Witnesses:

G. M. NEVILLE,
M. M. BOYLE.