Dec. 7, 1948. L. P. YOUNG 2,455,720

CORE INSULATOR

Filed Jan. 15, 1947

Fig. 1.

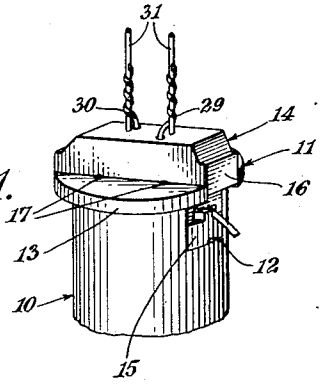


Fig. 2.

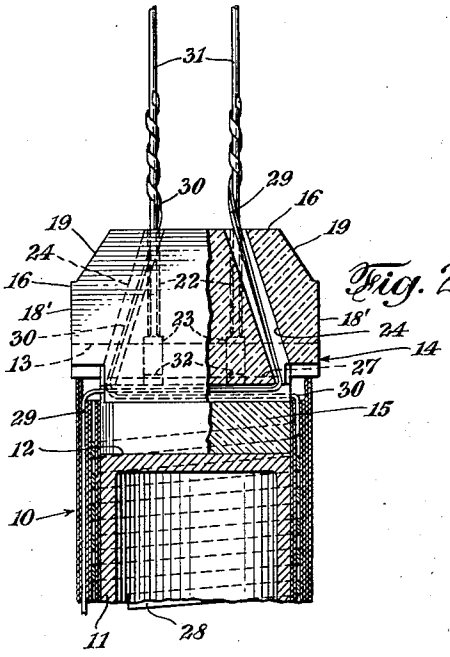


Fig. 3.

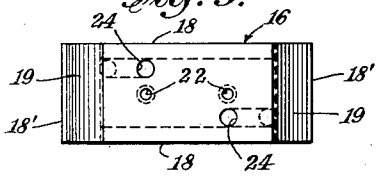


Fig. 4.

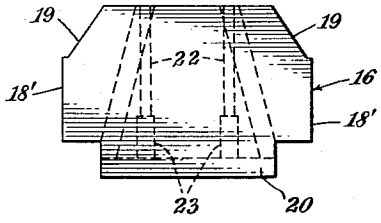


Fig. 5.

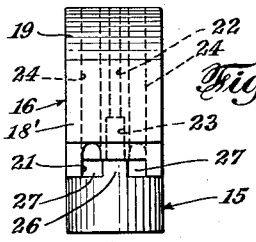


Fig. 6.

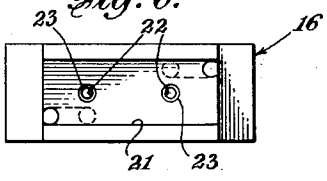


Fig. 7.

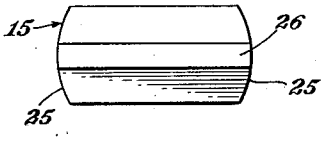


Fig. 9.

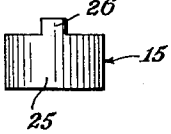
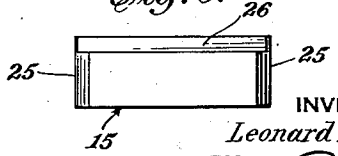


Fig. 8.



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CORE INSULATOR

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6 Claims. (Cl. 201—63)

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This invention relates generally to electric heating devices employing resistance wires, and especially to an insulator for the termini of such wire.

As is well known in the art, the association of the heating element ends in electric soldering irons with the cord extending from the handle of the iron usually presents difficulties in the assembly, and problems in the use of the iron, resulting in failures and repairs. When round resistance wire is employed the difficulty of connecting the ends thereof to suitable leads is not as great as in the case of ribbon resistance wire, which latter, while frail, and therefore more difficult to handle, is nevertheless preferred because of its flatness.

The present invention has for its prime object the provision with the support for a heating element of an insulator structure which will not only readily facilitate the association of the ends of a flat resistance wire with sturdy leads connected to the electric cord, but which also provides the necessary protection against breakage of the resistance wire, and especially of its bare end portions extending from the coil formation on the support toward the connecting points with such leads.

A more specific object of the present invention is to provide an insulator structure wherein are employed two cooperating insulator members consisting of lower and upper portions, which, when in their engaging position are adapted to form protective guide channels for the reception of the bare ends of the resistance wire, and suitable through-passages for bringing the wire ends to a position at which they may be secured to the leads at points at the exterior of the insulating structure.

Another object of this invention is the provision in the aforestated insulator structure, of ducts for anchoring therein suitable wire leads in such a relation to the resistance wire, whereby the attachment of the latter's termini to the leads is best facilitated, and whereby any strain upon the resistance wire ends is effectively absorbed by the anchored leads.

The foregoing and numerous other objects and advantages of the present invention will become more fully evident from the ensuing description in conjunction with the accompanying drawings, which latter, while showing a specific construction of the present invention, are by no means intended to limit the same to the actual showing, and wherein:

Fig. 1 is a fragmental perspective view of a heating element including the insulator of the instant development;

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Fig. 2 is an enlarged side elevation of Fig. 1, partially in vertical section;

Fig. 3 is a top view of the upper insulating member;

Fig. 4 is a side view thereof;

Fig. 5 is an end view thereof;

Fig. 6 is a bottom view of the upper insulating member;

Fig. 7 is a top view of the lower insulating member;

Fig. 8 is a side view thereof; and

Fig. 9 is an end view thereof.

Referring now specifically to the figures, numeral 10 denotes a resistance coil structure consisting of a core or element support 11, provided with a transverse recess 12 and a flanged end 13. Secured within the recess is an insulating structure 14 consisting of a lower member 15, which is wholly imbedded within recess 12, and an upper member 16, the lower end of which partially extends into the recess. It sometimes becomes advisable to impinge the upper member within the recess by indentations or punch marks shown at 17 in Fig. 1, although such punch marks are not essential.

The upper portion or member 16 of the insulating structure comprises a block formation with two parallel sides 18, and vertical ends 18', the upper portions of which ends change into beveled faces 19 to reduce the top end of member 16 and thus facilitate the insertion and setting of the resistance structure into the outer casing of an electric instrumentality. At the lower end of the block formation there is provided an endwisely reduced bottom extension 20 having a recess 21 extending over the latter's entire length. In the body of the block are provided two pairs of through-passages, one pair 22 of which, arranged in the longitudinal vertical center plane of the block, being parallel with one another, and also being parallel with the vertical center axis passing through the block. The bottom ends of passages 22 terminate in enlargements 23, which issue into recess 21. The other pair of passages 24 are inclined and are arranged symmetrically to one another and are disposed in near proximity to side faces 18 of the block. Their upper ends are in alignment with the upper ends of apertures 22, while their lower ends issue at diagonally opposite points and at the ends of recess 21.

The lower portion or lower member 15 comprises an elongated, rather flat formation pro-

vided with rounded ends 25, and from its upper surface there extends centrally and longitudinally between the two rounded ends a rib 26. The length of the lower insulating member substantially corresponds to the length of extension 20 of the upper member, and the height of rib 26 of the lower member substantially corresponds to the depth of recess 21 in extension 20. The width of rib 26 is substantially less than the width of recess 21, however the rib is sufficiently wide to cover the enlarged ends 23 of passages 22 when the two members are placed in engagement with one another, as clearly indicated in Fig. 5. In that position rib 26 divides recess 21 longitudinally into two parallel channels 27. These channels attain importance from the standpoint of efficient assembly of electric heating instrumentalities, such as electric soldering irons.

Referring now to Fig. 2, core or support 12 is covered with an insulating layer around which is wound a flat resistance wire 28. One end 29 of this resistance wire passes from the end of one of the channels 27 to its opposite end and from there is directed through the right hand through-passage 24 to without block 16. The other end 30 of the resistance wire enters the right hand end of the other channel, passes through the channel to its left end, and thence is directed to the left hand passage 24 to without the insulator body. Within the two parallel passages 22 there are secured lead wires 31 which are provided with enlargements 32 anchored in enlarged portions 23 of passages 22. Ends 29 and 30 of the heating element are secured to leads 31 exteriorly to the insulator structure.

It will be observed that channels 27, which extend across the core or element support, are so arranged that the ends 29 and 30 of the heating element may be readily directed through them into through-passages 24 without straining them, and that all the strain upon these element ends is taken up by anchored lead wires 31. It will be also observed that the element ends run flatly through channels 27 and passages 24 without twisting on their way to being attached to lead wires 31. In heretofore devices an inadvertent twist in flat resistance wire elements usually causes a break requiring replacement, often of the entire element.

One of the advantages of reducing the bottom portion of the upper member and making the lower member of the same length as the reduced extension of the upper member, resides in the fact that no portions of the heating element are exposed or are brought so near to the outer surface of the core that they may be subject to damage in assembly.

While, as previously stated, only one embodiment of the present invention is illustrated and described, changes and improvements in its structure may be required in order to adapt the same for various purposes, and which changes and improvements are to be considered to lay within the scope of the invention, as defined in the annexed claims.

I claim:

1. In an insulator for resistance wire of electric soldering irons or the like, a substantially narrow, elongated and relatively high two-piece structure adapted for association with the recessed end of a casing for supporting a heating element, said two-piece structure comprising upper and lower cooperating portions, said upper portion having an endwisely reduced downward extension provided with a recess along its entire length, a pair of vertical, parallel lead passages transversing the body of said upper portion and having enlarged ends terminating in the recess, and a pair of inclined, resistance wire-receiving passages extending from the top of the upper portion into and terminating at the ends of the recess; said lower portion having an upwardly directed, centrally disposed rib extending along its entire length, said rib being adapted to project into said recess, whereby the latter is divided into two parallel channels, and to seal the enlarged ends of said lead passages.

2. In an insulator for the purpose indicated, a two-piece dielectric structure composed of upper and lower cooperating portions, the upper portion forming an elongated block with substantially parallel sides and tapering upper ends and having an endwisely reduced bottom extension provided with a recess along its full length, a plurality of through-passages in the body of the upper portion, for the reception of leads and resistance wire, all terminating in said recess; said lower portion forming a body with rounded ends and having an upwardly directed, centrally disposed rib formation extending from end to end and directed into said recess, said rib formation being adapted to seal the bottom ends of the through-passages for the leads and to divide the recess of the upper portion into two parallel channels for guiding and insulating the ends of a resistance element.

3. In an insulator for leads and the ends of a resistance element, the combination with a resistance element support having a substantially channel-shaped recess in its flanged end, of an insulator structure placed in said recess, said structure comprising cooperating upper and lower interengaged portions forming guide channels for receiving, separating and guiding the ends of a resistance element, the upper portion having a plurality of means for accommodating and anchoring lead wires and for facilitating their connection with the ends of a resistance element.

4. In an electric heating device, an element support having a flanged end and a recess in said end, a heating element wound about the support, an insulator structure held in said support recess and comprising upper and lower portions, the latter portion substantially filling said recess, the major part of the upper portion extending beyond the recess, guide channels for the ends of the heating element formed by the two insulator portions within the recess of the element support, a plurality of through-passages in the upper portion, one pair of these through-passages having enlarged ends, lead wires with enlarged ends anchored in that one pair of passages, another pair of passages terminating in said guide channels, the ends of the heating element passing through said channels and into said other pair of passages and being secured to said lead wires without the body of the upper portion of the insulator structure.

5. In an electric heating device, the combination with the support for a resistance coil, of an insulator for the resistance wire secured at one end of the support and comprising cooperating lower and upper members, the lower member being disposed within the body of the support, the upper member extending beyond the latter, a pair of guide channels for the reception of the two resistance wire ends formed between the two members and extending across the body of the support, said upper member having a set of parallel passages with enlarged ends, and another

set of inclined passages terminating at the channel ends, lead wires anchored in the parallel passages, and the ends of the resistance wire passing from the channels through the inclined passages into engagement with the lead wires.

6. An insulator for an electric heating device, comprising cooperating lower and upper members, adapted, when in engagement with each other, to form guide channels for a resistance wire or the like, the lower member having an elongated body portion with rounded ends, a rib extending from the body portion centrally between its ends, the upper member constituting a block with a depending extension, the latter substantially corresponding in length to that of the lower member, a longitudinal recess provided in said extension, the depth of said recess corresponding substantially to the height of the rib of the lower member, the width of the recess being

substantially greater than that of the rib, a pair of parallel passages provided in the body of the upper member and having enlarged ends terminating in said recess, a pair of inclined passages in the upper body terminating at one of their ends at one end of the recess; said rib of the lower member being adapted to extend into the recess of the upper member, whereby said guide channels are formed.

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