

Dec. 11, 1934.

H. SCHWARTZMANN
ELECTRICAL INSULATING DEVICE HAVING A TERMINAL
THEREON AND A METHOD OF MAKING IT
Filed Oct. 12, 1932

1,984,036

FIG. 1.

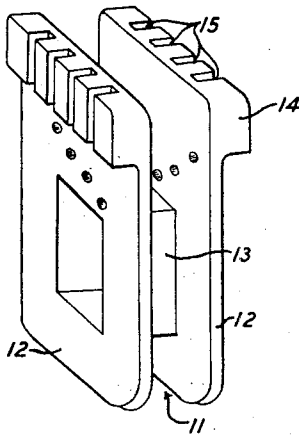


FIG. 2.

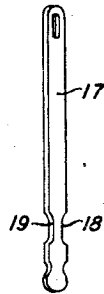


FIG. 3.

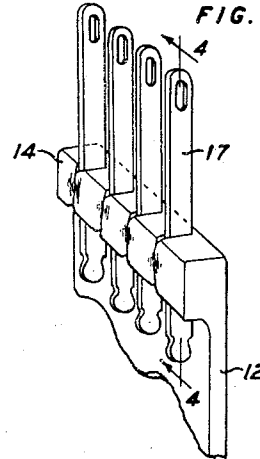


FIG. 4.

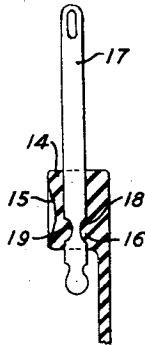


FIG. 5.

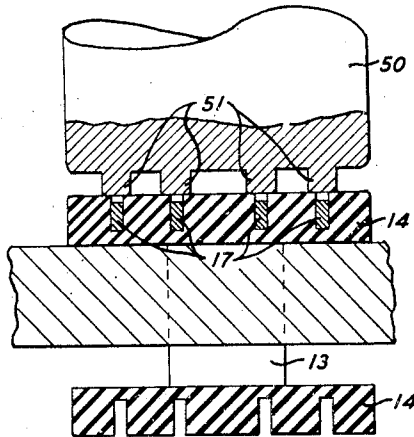


FIG. 6.

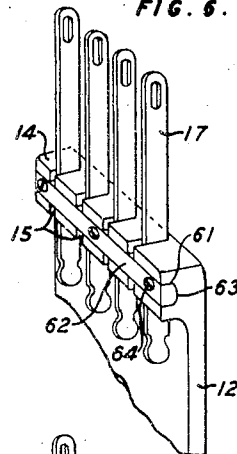


FIG. 7.

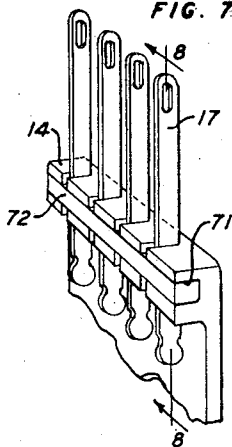


FIG. 8.

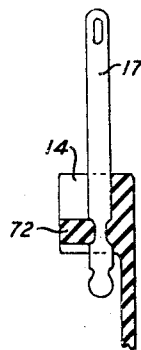
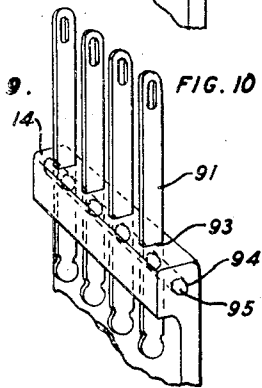


FIG. 9.



FIG. 10.



INVENTOR
H. SCHWARTZMANN
BY
E.R. Nowlan
ATTORNEY

UNITED STATES PATENT OFFICE

1,984,036

ELECTRICAL INSULATING DEVICE HAVING
A TERMINAL THEREON AND A METHOD
OF MAKING ITHarry Schwartzmann, New York, N. Y., assignor
to Western Electric Company, Incorporated,
New York, N. Y., a corporation of New York

Application October 12, 1932, Serial No. 637,497

9 Claims. (CL 175-21)

The invention relates to an electrical insulating device having a terminal thereon and a method of making it, and more especially to the manufacture of an insulating spool structure with terminals thereon, upon which an electrical winding can be readily applied and the ends thereof secured to the terminals.

An object of the invention is to provide an improved spool structure upon which an electrical winding can be applied and the ends thereof secured thereto and a method of making it.

In a preferred embodiment of the invention the spool structure is formed by molding a non-conducting core and non-conducting spool heads integral, the spool heads having integral outwardly extending shelf like extensions or flanges with a plurality of deep narrow slots at right angles to the shelf like extensions and integral ridges extending within the slots. The desired number of flat terminals having recesses on the inner and outer sides thereof are then assembled into predetermined slots so that they extend through the extension or flange and so that the recesses on the inner side engage the slots. Heat and pressure is then applied to the extensions or flanges to cause the material to flow toward the terminals and closely engage the outer surfaces of the terminals and the recesses in the outer surfaces to secure the terminals therein.

In another preferred embodiment the extension or flange is provided with an outer channel extending parallel to the extension or flange, the channel being shaped similar to the recesses in the terminals. After the terminals are assembled in the slots a clamping strip of suitable insulating material having its inner face shaped similar to the recesses in the terminals is secured in place in the channel.

Other objects and advantages of the invention will more fully appear from the following description taken in connection with the accompanying drawing wherein,

Fig. 1 is a perspective view of a preferred embodiment of a spool having projecting portions with slots therein for receiving winding terminals;

Fig. 2 is a perspective view of a preferred embodiment of a terminal for use with the spool shown in Fig. 1;

Fig. 3 is a perspective view of a portion of one of the spool heads shown in Fig. 1 with the terminals shown in Fig. 2 secured in the slots;

Fig. 4 is a cross sectional view taken along the line 4-4 of Fig. 3;

Fig. 5 is a cross sectional view of one means

for securing the terminals in place in the spool heads shown in Fig. 3;

Fig. 6 is a perspective view of a portion of a spool head with the terminals shown in Fig. 2 secured therein in accordance with another embodiment of the invention;

Fig. 7 is a perspective view of a portion of a spool head and terminals in accordance with another embodiment of the invention;

Fig. 8 is a cross sectional view taken along the line 8-8 of Fig. 7;

Fig. 9 is a plan view of an embodiment of a terminal for use in the embodiment shown in Fig. 10, and

Fig. 10 is a perspective view of a portion of a spool head in accordance with another embodiment of the invention.

In a preferred embodiment of an insulating device having terminals thereon, as shown in Figs. 1 to 5 inclusive, the spool 11 is formed or molded of insulating material of any suitable kind, such for example, as rubber, a cellulose acetate compound, a shellac compound, or other thermal plastic materials or compounds. The heads 12 are formed integral with the core 13. The core 13 is hollow so that if desired a magnetic core of any suitable kind (not shown) can be assembled therethrough after the winding (not shown) has been applied on the spool. Each of the heads 12 have an integral outwardly projecting shelf like extension or flange 14 with a plurality of deep narrow slots 15 at right angles to the shelf like extension or flange 14 and integral ridges 16 (Fig. 4) extending within the slots.

The terminals 17 are provided with an inner recess 18 and an outer recess 19, the inner recess 18 being so contoured as to engage the ridges 16 and so located that when the terminals 17 are assembled in the slots 15 with the inner recess 18 in engagement with the ridges 16, the lower ends of the terminals 17 extending below the shelf extension or flange 14 to permit fastening the leads from the winding (not shown) thereto and the upper ends of the terminals 17 extend above the shelf like extension or flange 14 to permit fastening external conductors (not shown) thereto.

After the terminals 17 are properly assembled in the slots 15 a heated pressing implement 50 (Fig. 5) having spaced ridges 51 extending parallel to the slots 15 is applied to the shelf like extension or flange 14 to cause the insulating material to flow toward the terminals 17 and closely engage the outer surfaces of the terminals 17 and

close the outer surfaces of the recesses 19 to secure the terminals therein. Preferably the heated pressing implement 50 has a single spaced ridge 51 extending directly over each of the slots 15 as shown in Fig. 5 so that the material is forced directly into the outer portions of the slots 15. In some instances, especially where a large number of different types of spool assemblies are to be treated on the same press it may be desirable to omit the ridges 51 from the implement 50 and press the entire surface of the extension or flange 14.

In a preferred embodiment of the invention as shown in Fig. 6 the outwardly projecting shelf like extension or ledge 14 of each of the heads 12 is provided with an outer channel 61 extending parallel to the extension or ledge 14, the channel 61 being shaped similar to the outer recesses 19 of the terminals 17. After the desired number of terminals 17 are inserted in the desired slots 15, a clamping strip 62 of suitable insulating material and having its inner face 63 shaped similar to the outer recesses 19 of the terminals 17 is secured in place in the channel 61 by any suitable means such as screws 64.

In another preferred embodiment shown in Figs. 7 and 8 the retaining or clamping strip 72 which fits into the channel 71 is made of a thermal plastic compound or a partially cured insulating compound and is secured in place by applying heat and pressure to the ledge 14 and the clamping strip 72 to further cure the clamping strip 72 and securely hold the terminals 17 in place.

When the width of the shelf like extension or ledge 14 is sufficient, as shown in Figs. 7 and 8 to permit the use of a clamping strip 72 having a width at least as great as its depth, the clamping strip may be made of any suitable insulating material and may be held in place in the channel 71 by means of suitable cement.

In another preferred embodiment as shown in Figs. 9 and 10 the terminals 91 have circular holes 92 therein. The outward projecting shelf like extensions or ledges 14 of the spool heads 12 are provided with vertical slots 93 during the molding operation which extends through the extension or ledge 14, the outer ends of the slots 93 in the extension or ledge 14 being closed. Holes 94 are drilled through the extensions or ledges 14 parallel thereto. The terminals 91 are assembled in position in the desired slots 93 and rods 95 of insulating material are assembled through the holes 94 in the ledges 14 and through the holes 92 in the terminals 91 to securely lock the terminals in place.

The above described method of constructing a spool assembly has several important advantages not possessed by certain other methods formerly practiced; first, it provides a spool assembly which can be molded in one piece in a single simple mold and have terminals in the two heads thereof projecting above and below the shelf like extension or flange which is impracticable if the terminals are to be molded with the heads and the core, and, second it provides a spool assembly which can be made with a single simple mold and in which different numbers of terminals can be later assembled in various positions, there being less objection to having unused slots in the shelf like extension or flange than unused projecting terminals on a completed coil.

The invention is also capable of other modifications and adaptations not specifically referred

to but included within the scope of the appended claims.

What is claimed is:

1. In a spool for receiving a winding for an electrical device, a spool head of insulating material having an integral outwardly projecting shelf like extension with a plurality of deep narrow slots therein at right angles to said shelf like extension, a channel extending in said shelf like extension and parallel thereto, ridges integral with said extension extending within the slots, a plurality of flat terminals assembled in said slots and extending through said extension and each having a recess in the inner side thereof for engaging with the ridges in said slots, and another recess in the outer side thereof, and a clamping strip in said channel for engaging with the recess in the outer side of each of said terminals to secure said terminals in the slots in said shelf like extension.

2. In a spool for receiving a winding for an electrical device, a core and a pair of spool heads of insulating material integral therewith, each of said spool heads having an integral outwardly projecting shelf like extension with a plurality of deep narrow open slots therein at right angles to said shelf like extension, an outer channel extending in said shelf like extension and parallel thereto for the entire length thereof, ridges integral with said extension extending from the inner sides of the slots and within the slots, a plurality of flat terminals assembled in said slots and extending above and below said extension and each having a recess in the inner side thereof for engaging with the ridges in said slots, and another recess in the outer side thereof, the outer side of each of said terminals and the recess in the outer side thereof being within the deep narrow slots, and a clamping strip in said channel for engaging with the recess in the outer side of each of said terminals to secure said terminals in the slots in said shelf like extension.

3. The method of producing a molded spool of insulating material for receiving windings requiring different numbers of terminals or terminals in different locations which comprises forming a pair of heads each having an integral outwardly projecting shelf like extension with a plurality of slots therein at right angles to the shelf like extension and with ridges integral with said extension extending within the slots, assembling the required number of terminals having recesses therein in their respective predetermined slots with the recesses in engagement with the ridges in the slots, applying heat and pressure to narrow strips of the insulating material parallel to the slots to cause the material to flow toward the terminals and closely engage the outer edges thereto.

4. In a spool for receiving a winding for an electrical device, a core and a pair of spool heads of insulating material integral therewith, one of said spool heads having an integral outwardly projecting shelf like extension with a plurality of vertical slots therethrough and a hole therethrough intersecting with the slots and parallel to the extension, a plurality of flat terminals each having a hole therethrough assembled in said slots and extending through said extension, and a rod of insulating material extending through the hole in the ledge and the holes in the terminals to securely lock the terminals in place.

5. In a spool for receiving a winding for an electrical device, a head of insulating material

having an integral outwardly projecting shelf like extension with a plurality of deep narrow slots therein at right angles to said shelf like extension, and a plurality of flat terminals, each
5 having a portion thereof cut away, assembled in said slots and extending through said extension, and means engaging with the terminals on the surface thereof where the portion has been cut away to secure said terminals in place,
10 said terminals adapted to be assembled in said spool head after said slots and ridges have been formed.

6. In a spool for receiving a winding for an electrical device, a core and a pair of spool heads
15 integral therewith all of insulating material, one of said heads having an integral outwardly projecting shelf like extension comprising a plurality of alternating lugs and slots, the lugs being
20 formed to receive and support a terminal retaining member, a plurality of terminals each positioned within one of the slots, and a terminal retaining member received in and supported by the lugs to hold the terminals in place.

7. In a spool for receiving a winding for an electrical device, a core and a pair of spool heads
25 integral therewith all of insulating material, one of said heads having an integral outwardly projecting shelf like extension comprising a plurality of alternating lugs and slots, the lugs being
30 formed to receive and support a terminal retaining member, a plurality of terminals each positioned within one of the slots and each formed

to coact with a terminal retaining member, and a terminal retaining member received in and supported by the lugs to hold the terminals in place.

8. In a spool for receiving a winding for an electrical device, a core and a pair of spool heads
5 integral therewith all of insulating material, one of said heads having an integral outwardly projecting shelf like extension comprising a plurality of alternating lugs and slots, the lugs being
10 formed with slots to receive and support a terminal retaining member, a plurality of terminals each positioned within one of the slots and each slotted to coact with a terminal retaining member, and a terminal retaining member received
15 in and supported by the lugs to hold the terminals in place.

9. In a spool for receiving a winding for an electrical device, a core and a pair of spool heads
20 integral therewith all of insulating material, one of said heads having an integral outwardly projecting shelf like extension comprising a plurality of alternating lugs and slots, the lugs being
25 formed with perforations to receive and support a terminal retaining member, a plurality of terminals each positioned within one of the slots and each perforated to coact with a terminal retaining member, and a terminal retaining member received in and supported by the lugs
30 to hold the terminals in place.

HARRY SCHWARTZMANN.