

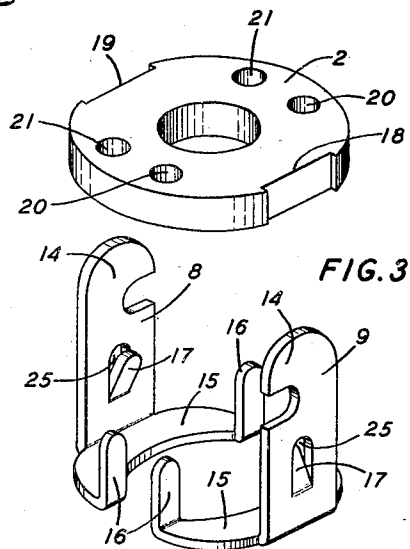
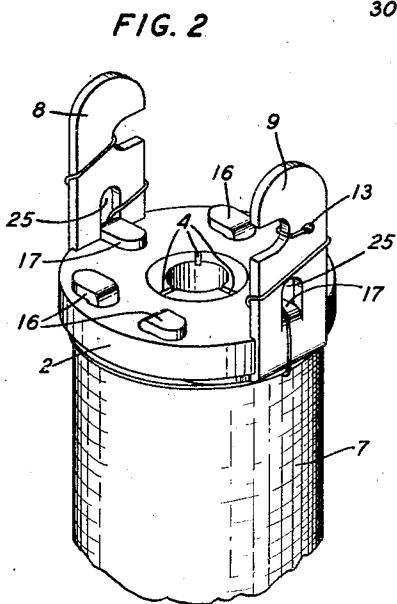
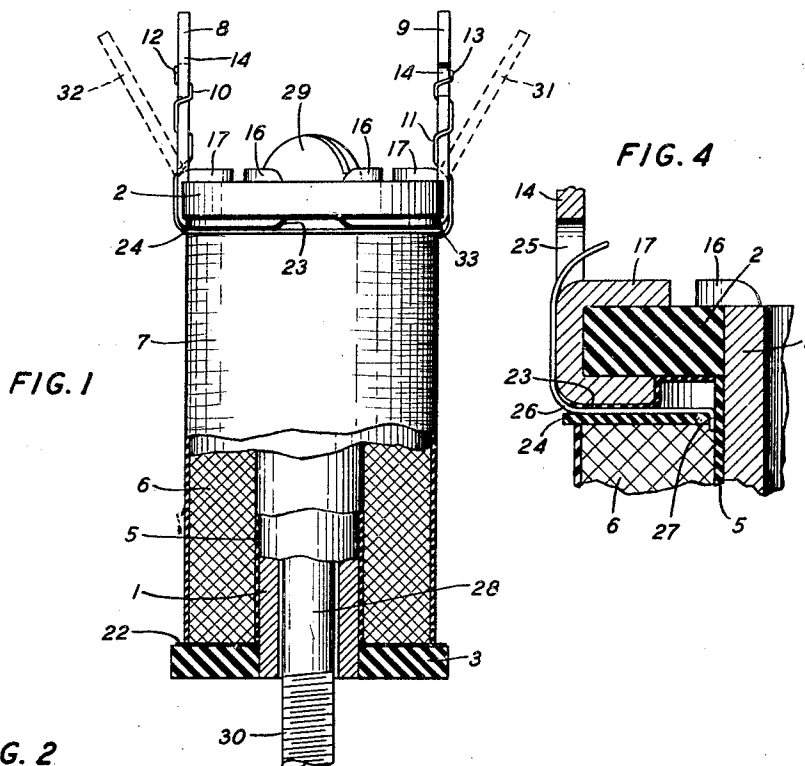
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TERMINAL CONNECTER

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TERMINAL CONNECTER

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This invention relates to terminal connectors for electrical elements, and more particularly to terminal connectors for electrical elements such as electromagnets, resistance units, and the like in which a winding is supported on a spool having spoolheads of insulating material.

An object of this invention is to provide in electrical elements of the above mentioned character, terminal members which are so mounted on a spoolhead that they cannot readily be displaced or dislodged therefrom, which have substantially widely separated points engaging the upper and lower faces of the spoolheads, and which may be attached to the spoolhead in such a manner as to materially reduce the cost of production of such electrical elements.

In electrical elements such as electromagnets, resistance units and the like in which a winding of wire is supported on a spool, it is essential that the ends of the wire winding be brought out from the spool to attach to leads to an outside circuit. It has been the practice to provide terminal members for attachment to the ends of the winding and to support the terminal members in or on an end or head member of the spool. In some instances the terminals are tab terminals insulated from one another and supported in a pile-up of alternate terminal members and insulating washers on one end of the spool, the pile-up being secured to the end of the spool by suitable nut and bolt members or a mounting screw traversing the pile-up of terminals and insulating washers and the core of the spool. In other instances, tab terminals having enlarged end portions have been run through apertures in an end member of the spool and held against retraction from the apertures by means of the wire winding. Terminal members having enlarged end portions and inserted through apertures in a spoolhead have also been held in place by having bent back portions upset or turned over against one face of the spoolhead. Terminal members having staple-like claws in their under surfaces for pressing into suitable apertures or holes in a spool-

head have also been provided in some electrical units of this type.

In cases where a pile-up of terminals and insulating washers is employed the terminals are not very widely separated from one another and they very easily become bridged. Connecting of the ends of the winding or windings to the terminals in such cases is rather difficult and some means must also be provided to prevent rotation of the terminals on their supporting means.

In all of the other above mentioned prior art structures, the point of attachment or engagement of the terminal with the spoolhead is at the base of the tab portion of the terminal and in substantial longitudinal alignment with the tab portion. Terminals so supported oftentimes become loose and capable of rotation at the point of support, and being supported at only one main point, are comparatively easily separated from the spoolhead. Apertures or slots in the spoolhead must also be provided so that the wire ends may be led to the terminals.

In this invention the terminal members are comparatively widely separated from one another and no bolts or screws are required to secure them in place on the spoolhead. The terminals are secured to the spoolhead at a plurality of comparatively widely separated points of attachment and there is therefore no danger of turning or rotation of the terminals or dislodgment of the terminal from its support.

Features of this invention reside in co-operating means on each terminal member for securing it to a spoolhead comprising a forked end which extends partially around the core of the element and engages the under surface of the spoolhead, which has lugs projecting upward through apertures in the spoolhead and turned over ends engaging the upper surface and a spur member thrown inward over the upper surface of the spoolhead from a tab portion of the terminal member located substantially mid-way between the outer extremities of the forked end.

This invention is applicable to all forms of electrical units in which coils of wire are

supported on a spool and is shown for the purpose of illustration as applied to a common type of resistance unit in the accompanying drawings in which:

5 Fig. 1 is a side elevational view partly in section of a resistance unit with the terminals attached to an upper spoolhead;

Fig. 2 is a view in perspective of the upper portion of the unit shown in Fig. 1;

10 Fig. 3 is a view in perspective of the upper spoolhead and the terminals ready for attachment thereto; and

Fig. 4 is a side view in cross section of an upper corner of the unit shown in Fig. 1.

15 Referring to the drawings, 1 is a tubular core and 2 and 3 are flange members attached to the ends of the core 1 to cooperatively form a spool. The core 1 may be of brass tubing or the like or may be of insulating material. The flange members 2 and 3 are

20 preferably of insulating material and are secured to the ends of the core 1 by staking the ends of the core 1 as shown at 4 in Fig. 2. Over the core 1 is a coating of insulating

25 material 5 which may be a wrapping of paper or other material sufficient to insulate the core 1 from a winding of wire 6 which is of sufficient length for the purpose for which the unit is required. The winding 6 is

30 wound over the core 1 between the flange members 2 and 3. Over winding 6 is wound a serving 7 of a cellulose derivative in fibre or strand form. The winding of cellulose derivative after being

35 applied to the wire winding is subjected to a solvent to dissolve a portion thereof and cause the adjacent fibres or strands to coalesce and form an imperforate film or outer coating reenforced by the undissolved portion

40 of the fibres or strands. This outer coating forms an imperforate coating for the protection of the wire winding and eliminates the necessity of having to provide a metallic shell or like covering for the winding of the unit. A suitable covering of this

45 character may also be obtained by winding over the wire a serving of thread and coating the thread with a cellulose derivative such as nitrocellulose or cellulose acetate and thereafter applying to the cellulose coating a suitable solvent to partially dissolve the cellulose material and produce an imperforate coating

50 over the entire winding.

Supported on the flange 2 are terminal

55 members 8 and 9 to which are attached the inner and outer ends 10 and 11, respectively of the winding 6, the ends of the winding 6 being soldered to the terminals 8 and 9 at 12 and 13 as shown.

60 Each terminal 8 and 9 is a metal stamping having a tab portion 14, to which may be attached wires from an outside circuit, and a furcellate end portion 15 having upturned end portions 16 for attachment to the flange

65 2. Thrown inward from each tab portion 9

is a spur 17 to engage the upper surface of flange 2.

The flange 2 is provided with diametrically disposed slots 18 and 19 for the accommodation of the tab portions 14 of the terminals 8 and 9. Within the flange 2 are paired apertures 20—20 and 21—21 to receive the upturned end portions 16 of the terminals 8 and 9.

To attach the terminals 8 and 9 to the flange 2 the upwardly extending end portions 16 on the furcellate end portion 15 are brought upward through the apertures 20—20 and 21—21 and bent over against the upper face of the flange 2 as shown in Fig. 2. The spur portions 17 are bent downward against the upper surface of the flange 2 and the tab portions 14 are set into the slots 18 and 19 respectively.

After the terminal members 8 and 9 have been applied to the flange 2 and before the winding 6 has been wound on the spool, the inner surfaces of the flanges 2 and 3 and the inner portions of the terminals 8 and 9 are given a coating of an insulating cement indicated at 22, 23 respectively. An insulating washer 24 is provided between the winding 6 and the flange 2.

The formation of the spurs 17 on the terminals 8 and 9 results in the provision of apertures 25 in the tab portions of the terminals and the ends of the winding 6 are led through the apertures 25 thus provided and attached to the tab portions as above mentioned.

The inner end of the winding 6 is wrapped about the tab portion 14 of the terminal 8 and passes downward through the aperture 25 formed by the formation of the spur member 17 as shown in Fig. 4. The inner end of the winding after being inserted through the aperture 25 passes over the outside surface of the lower portion of the terminal 8 and across the center of the furcellate portion 15 and thence between the insulating cement coating 23 and the insulating washer 24 as shown at 26. The inner end of the winding is then led between the insulating coating 5 on the core 1 and the insulating washer 24 as shown at 27. The winding is then applied to the spool and the outer end of the winding is brought back to the terminal 9 and passes over the outer edge of the insulating washer 24 as shown at 28, thence over the outer portion of the lower section of the terminal 9 and then through the aperture 25 formed by the making of the spur member 17. The outer end of the winding is then wrapped about the terminal 9 and brought to a point 13 where it is soldered to the terminal.

As a means for mounting the resistance unit on a suitable support a bolt member 28 is shown in Fig. 1. This bolt member 28 passes through the core 1, the head 29 of the

bolt engaging the flange 2 and the threaded end 30 projecting from the base of the resistance unit.

It will be apparent from the above description that the terminals of this invention may readily be applied to the ends of spool members on which windings of wire are to be supported and that having the furcellate end portion 15 engaging the under surface of a spoolhead and the projecting ends 16 passing upward through the apertures 20—20 and 21—21 and bent over against the upper face of the spoolhead and the spur member 17 thrust downward against the upper face of the spoolhead and so supporting the terminals at a plurality of comparatively widely separated points that the terminal is very substantially supported on the spoolhead and that dislodgment and twisting of the terminal is prevented.

The tab portions 14 of the terminal members may project upward from the flange member 2 in a direction normal to the plane of the flange member 2 or may project radially from the outer edge of the flange member 2 as shown in dotted lines 31, 32 in Fig. 1 according as desired. Radial movement of the terminal members with respect to the flanges on which they are supported is prevented by having the tab portions on the terminals set into the slots 18 and 19 in the flange member 2. Preventing radial movement of the terminals with respect to the supporting flange member 2 eliminates the possibility of shearing off of the upwardly projecting end portions 16. The end portions 16 which are bent over against the face of the flange member 2 and the spur member 17 which bears against the upper surface of the flange member 2 at a point substantially mid-way of the point of contact of the bent over end portions 16 work in conjunction to prevent dislodgment of the terminal members from the supporting flange member 2.

While this invention has been disclosed as applied to a particular type of electrical unit it will be apparent that it may be used in connection with other electrical units of a similar character and that various modifications may be made in the structure disclosed without departing from the spirit of this invention as set forth in the following claims.

What is claimed is:

1. In an electrical element comprising a winding, a support therefor and a head member on the support, a terminal attached to the head member, said terminal having a lower portion engaging the under surface of the head member and attached to the head member at widely separated points, and an upper portion engaging the upper surface of the head member at a point intermediate the points of attachment of the lower portion.

2. In an electrical unit comprising a winding, a spool supporting member therefor having a spoolhead, a terminal attached directly to the spoolhead, said terminal having a pair of arms engaging one surface of the spoolhead and attached to the spoolhead at widely separated points, and a spur engaging an opposite surface of the spoolhead at a point intermediate of the points of attachment of the said arms.

3. In an electrical unit comprising a wire winding, and a spool supporting member therefor having a core and a spoolhead, tab terminals attached directly to the spoolhead, said tab terminals having forked end portions partially encircling the core and engaging a surface of the spoolhead and spur members thrown inward toward the core engaging an opposite surface of the spoolhead.

4. In an electrical unit comprising a coil and a spool support therefor having a core and a spoolhead attached to the core, tab terminals attached to the spoolhead and extending in a plane normal to the plane of the spoolhead, said tab terminals each comprising a furcellate end portion partially encircling the core and engaging a face of the spoolhead and having angular lugs extending through the spoolhead engaging the opposite face, a tab portion extending in a direction normal to the plane of the spoolhead and a spur on the tab portion extending inwardly therefrom and engaging an opposite face of the spoolhead to that engaged by the furcellate end portion.

5. In an electrical unit comprising a coil and a spool support therefor having a core and spoolheads attached to the core, terminals attached to a spoolhead and to the coil, said terminals each comprising a bifurcated end portion partially encircling the core and engaging a surface of the spoolhead and having angularly disposed lugs on the ends of the bifurcation extending through the spoolhead and engaging the opposite surface, a tab portion intermediate of the ends of the bifurcation and extending in a direction normal to the plane of the spoolhead, said tab portion having a spur engaging the same surface of the spoolhead as that engaged by the angularly disposed lugs and opposite to that engaged by the bifurcation.

6. In an electrical unit comprising a coil and a spool support for the coil having a core and spoolheads attached to the core, terminal members secured to a spoolhead and serving as connecting means between the ends of the coil and the wires of an outside circuit, said terminal members each comprising a bifurcated end portion which engages a surface of the spoolhead, an intermediate tab portion extending radially of the spoolhead and a spur extending from the tab portion and engaging a surface of

the spoolhead, the forming of said spur member providing an aperture in the tab portion through which an end of the coil is led and attached to the tab portion of the
5 terminal.

7. In an electrical unit comprising a coil and a spool support therefor having a core and a spoolhead attached to the core, tab terminals attached to the spoolhead and
10 extending outward therefrom, said tab terminals each having a furcellate end portion partially encircling the core and engaging a surface of the spoolhead and having lugs extending upward through the spoolhead with
15 ends turned over against the face of the spoolhead opposite to that which is engaged by the furcellate end portion, a tab portion extending outward from the spoolhead and a spur on the tab portion thrown inwardly
20 therefrom toward the core and engaging a face of the spoolhead opposite to that which is engaged by the furcellate end portion.

In witness whereof, I hereunto subscribe my name this 16th day of September, 1930.

ROBERT A. OGG.

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