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ELECTRICAL TERMINAL STRUCTURE

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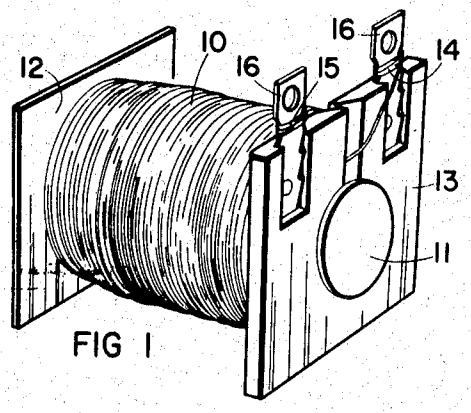


FIG 1

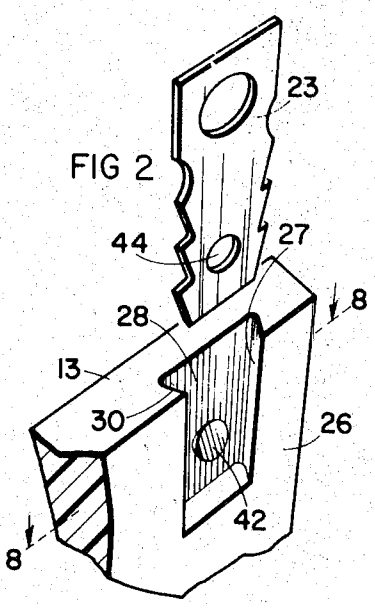


FIG 2

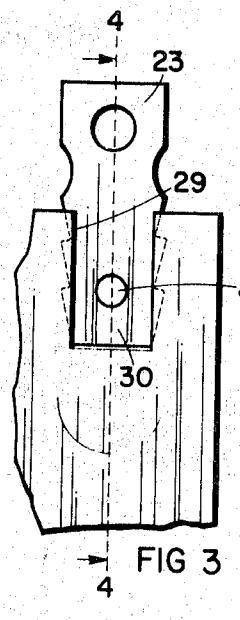


FIG 3

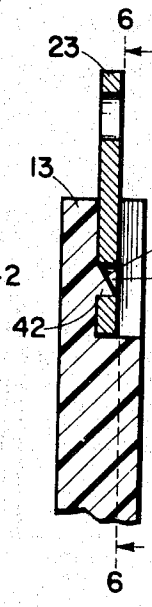
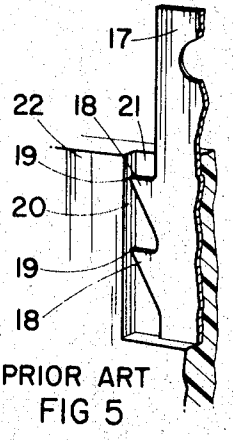


FIG 4



PRIOR ART
FIG 5

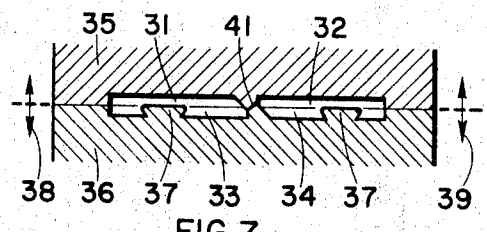


FIG 7

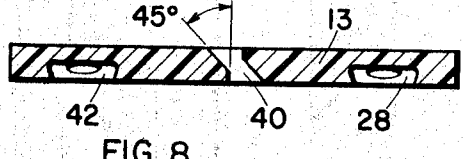


FIG 8

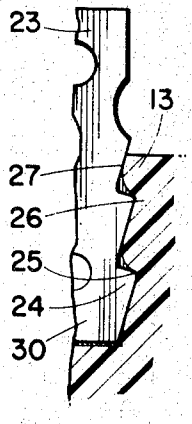


FIG 6

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ELECTRICAL TERMINAL STRUCTURE

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U.S. Cl. 339—221 2 Claims

ABSTRACT OF THE DISCLOSURE

This is an electrical terminal which has a conductive flat striplike terminal portion having serrated edges and an aperture formed therethrough which is engaged to a plastic support structure having a slot formed therein. The aperture of the terminal is engaged on a stud formed in the slot of the support and the serrated edges engage against the side walls of the slot.

This invention relates to an electrical terminal structure of the serrated bayonet type of improved capability of fabrication assembly and resistance to breakage.

Serrated bayonet type electrical terminal devices are well known. They are usually characterized by a tubular or flat copper, bronze or brass terminal member having thereon barb means such as serrated teeth projecting therefrom to engage surfaces of an accommodating recess or socket in an electrical insulating carrier member. Heretofore the carrier member has been formed from plastic materials of essential insulating properties and mechanical strength. Phenol resins have been a popular and natural choice for such applications. The moulding properties of phenol resins are particularly satisfactory and being especially inexpensive are widely used for electrical terminal mountings especially in connectors, switch gear, relay components, coil supports and the like.

It has been observed according to this invention that phenolic plastic materials such as may be well known by the trademark "Bakelite," exhibit a low internal viscosity and relatively high rigidity or low order of elasticity to the extent that the same are ordinarily regarded as somewhat brittle. Brittleness is controlled by the inclusion of substantial filler material which reduces cost and increases resistance to mechanical shock. Nevertheless the characteristics of such material under continuous stress will lead to cracking, warping and failure of insulating properties. Thus the proper electrical use of a low internal viscosity, low order of elasticity of material such as derived for electrical applications from phenolic glass resins should avoid stress or deformation of any kind in connecting a terminal to an insulate body of such material. In spite of the fact that such information is known to many skilled persons serrated bayonet type terminal devices have been inserted into sockets within phenolic class supports for probably more than fifty years. The immediate failure of the brittle support has been avoided by substantial use of filler material. However, the basic characteristics of such a support material do not provide any resistance to grip the terminal other than that available from the filler material used. Thus such terminal assemblies have a propensity for shaking loose in use. Of the bayonet type of terminals the split hollow tube providing outward elastic pressure against the walls of the receiving socket is the more satisfactory in its endurance under vibration or disturbing force.

It is, the main object of this invention to provide a bayonet type electrical terminal device of flat strip form adapted to endure heavy vibration or disturbing forces

by support under elastic tension in an elastomer insulating material of high internal viscosity such as may be derived for example, from vinyl classes of resins, such as polyvinyl chloride and other forms having a "strain memory" or ability to recover a moulded form when distorted therefrom such as materials known by the trade names nylon, Dacron and Orlon.

It is a further object of the invention to provide an electrical terminal structure especially for coil end supports which is adapted to be moulded in a two part mould without necessitating socket withdrawal inserts thus to take advantage of elastic properties of the elastomer material used.

Other objects of the invention will be apparent from a study of the following specification taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of a coil wound upon a core form or spool having coil form ends carrying the terminal structure of the invention;

FIG. 2 is an enlarged exploded view of right hand fragment of FIG. 1;

FIG. 3 is an elevation of the assembled components of FIG. 2;

FIG. 4 is a section of the line **4**—**4** of FIG. 3;

FIG. 5 is a perspective elevation of prior art structure;

FIG. 6 is a view similar to FIG. 5 but of structure of the invention sectioned as at line **6**—**6** of FIG. 4;

FIG. 7 illustrates a two-piece die technique for moulding the terminal support of the invention; and

FIG. 8 is section on the line **8**—**8** of FIG. 2.

In FIG. 1 an ordinary but not exclusive use of the invention is shown. Coil winding **10** wound upon core **11** extends between core ends (sometimes referred to in the art as spool ends, core end plates, end supports or flanges) **12** and **13**. It is convenient to form such spool ends of an insulating material not only to assist in protecting coil **10** but also to provide a suitable insulate support for making electrical connection of coil wires **14** and **15** to suitable terminals **16** which may be mounted on the one or both spool ends. In many other electrical applications a coil associated with spool ends requires terminal connections which are proof against shock vibration and aging.

As described above and referring in more detail to FIG. 5, a flat strip serrated bayonet type connector **17** of the prior art presents rearwardly flaring spur elements **18** adapted by their sharp pointed spur tips **19** to physically scrape rigid surfaces **20** of a hexahedral socket **21** which usually is in the form of a closed socket having one entrance opening only but which in the present instance is shown in a mouldable form with an open face **22**. Such prior art connection is not generally used except in short life connections where no vibration or shock is expected. The form is exceptionally inexpensive to manufacture especially where socket **21** is open-faced as shown permitting a two piece forming die within retractable inserts.

The present invention is addressed to the problem of such prior art class of connector and realises its modification and application to long life connections adapted to endure heavy vibrations and shock. Thus in FIGS. 2 to 4 and 6 and 8 the connector of the invention embodies a serrated bayonet type rigid metal strip **23** having rearwardly flaring spur elements **24** with slightly radiused spur tips or retaining shoulders **25** to press into the material of the terminal support **26** in the region of the dovetail surfaces **27** of open sided dovetail socket **28**. Outer free portions **29** of outwardly converging dovetail surfaces **27** substantially overlie the outer or exposed surfaces **30** of the connector. Thus the connector **23** cannot be moved laterally out of the retaining dovetail socket. The connector support **26** is made according to this invention from an insulate elastomer of high internal viscosity and relatively high rigidity characterized by strain memory

such as a polyvinyl chloride and similar thermosetting materials having a strain memory.

A two piece moulding techniques may be employed as shown in FIG. 7 by providing cavities **31**, **32** and **33**, **34** in mould plates **35**, **36** embodying male dovetail portions **37** adapted upon separation of mould plates **35**, **36** by arrows **38**, **39** to separate from the moulded part by flexing of the latter thereabout due to sliding of surfaces **30** thereover. The part section formed is shown in FIG. 8 and demonstrates a slot opening **40** formed at a transverse angle of 45 degrees about a right angular mould parting line **41**. In addition a spur retaining boss **42** is simultaneously formed with a ramp surface **43** adapted to accommodate the insertion of a terminal strip thereover to a socket seated position as shown in FIGS. 3 and 4 at which boss **42** projects into backing aperture **44** of the electrode **23**.

As indicated in FIG. 6, the material of the support gradually flows toward and about the retaining shoulder **25** rendering the terminal mounting effectively permanent after a period of days, weeks or months depending upon the rigidity of the material. This action however is not essential during the early life of the connector mounting but is required only to the extent that the socket effectively increases its support over a period of time by virtue of the memory characteristic of the material as contrasted with the prior art form of support socket opening up due to shrinkage and cracking.

The invention provides a successful connector and support for a large variety of applications in which strip bayonet connectors could not be used heretofore.

We claim:

1. In an electrical terminal structure of the flat-bayonet type: a terminal bayonet strip having rearwardly flared spurs thereon each terminating in an outward gripping shoulder of small radius; an insulate elastomer supporting body of high internal viscosity having physical properties under strain adapted for cold flow to recover an unstrained shape; and an open-faced terminal socket in said body having surfaces in strain engagement accommodating said shoulders at least of said strip inserted therein, and said socket is of dovetail form in section presenting outwardly converging surfaces overlying a substantial portion of said terminal inserted therein.

2. The structure of claim **1** and a ramped backing boss in said socket and corresponding backing means in said strip engageable thereby to retain said strip in said socket.

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