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E. KOHLER ETAL
CONNECTOR SUPPORTING HOUSING COVER

3,140,140

Filed March 21, 1962

FIG. 1

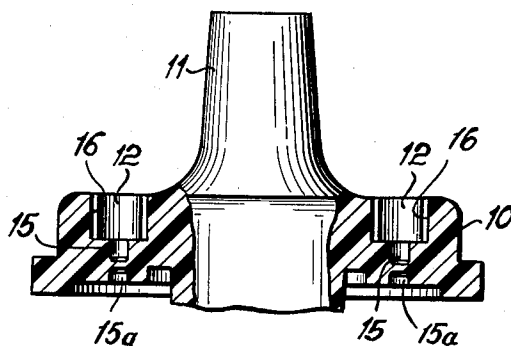


FIG. 2

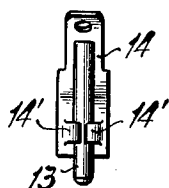


FIG. 3

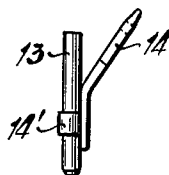


FIG. 4

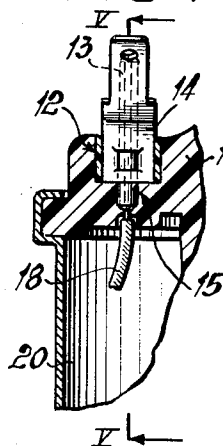


FIG. 5

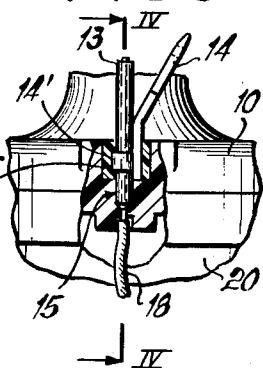
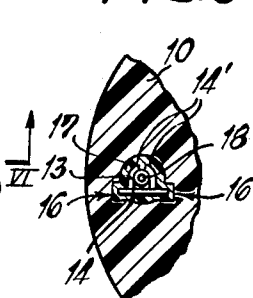


FIG. 6



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CONNECTOR SUPPORTING HOUSING COVER

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7 Claims. (Cl. 339-218)

The present invention relates to a connector supporting housing cover, and more particularly to a cover or cap for the housing of an electric coil, particularly of an ignition coil of the type used for combustion engines. Covers or caps for this purpose are made of an insulating material in which connectors are permanently embedded so that conductors can be attached to connector parts on the outside of the cover or cap, while the ends of the coil in the housing are attached to parts of the connectors located on the inside of the cover or cap.

In accordance with the prior art, the connectors are set in the proper relative position in a suitable mold or die, and the insulating material is then pressed in the mold to surround the connectors which are thus permanently embedded in the pressed insulator body.

The proper positioning, and fixing of the connectors in the press mold in such a manner that they are not displaced during the pressing operation, is a difficult, time consuming, and consequently expensive operation.

It is one object of the present invention to provide a connector supporting housing cover which can be manufactured at low cost.

Another object of the present invention is to provide a connector supporting housing cover with connectors set into openings of an insulator body, and permanently anchored in the same.

The cover preferably comprises an insulator body with at least one non-circular opening, a connector means of non-circular configuration located in the opening and matching the same so as to be non-turnable, and a material placed in said opening while in a deformable condition and being in a rigid condition so that the connector means is anchored in the material.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing in which:

FIG. 1 is a side elevation, partly in section, illustrating a pressed insulator body which is used for a housing cover in accordance with the present invention;

FIG. 2 is a front elevation of a connector according to the present invention;

FIG. 3 is a side view of the connector shown in FIG. 2;

FIG. 4 is a fragmentary sectional view taken on line 4-4 in FIG. 5, and illustrating a connector supporting housing cover in accordance with the invention;

FIG. 5 is a fragmentary side view, partly in section on line 5-5 in FIG. 4; and

FIG. 6 is a fragmentary cross sectional view taken on line 6-6 in FIG. 5.

Referring now to the drawings, the cover body 10 consists of a pressed insulating material, for example of Bakelite. As best seen in FIG. 1, insulator body 10 has a central projecting part 11 in which a connector, not shown, may be permanently embedded for the purpose of supplying a high voltage to a coil, not shown, in a housing 20 to which the insulator body 10 is later secured, as shown in FIG. 4.

Two diametrically arranged openings or recesses 12 are formed in the insulator body 10. Openings 12 are non-circular, and include a substantially semi-circular part, and two slot portions 16, as best seen in FIG. 6. Each opening or recess 12 has a cylindrical portion 15 extending from the bottom thereof. Corresponding cylindrical recesses 15a extend from the bottom face of the pressed insulator body and are separated by thin wall portions from the cylindrical recesses 15. The diameter of recess portions 15 and the width of slots 16 are smaller than the major dimensions of recesses 12.

A connector means in accordance with the present invention is shown in FIGS. 2 and 3. The drawing is made on an enlarged scale and the connectors are actually much smaller. Each connector includes a tubular part 13 of circular cross section which fits into openings 15, and a connector part 14 in the form of a plate whose upper part is bent at an angle to the lower part thereof. The lower part of connector 14 has pressed projections 14' which embrace the tubular part 13 and are tightly bent against the same so that connector parts 13 and 14 are fixedly connected.

The projecting parts 14' have an outline corresponding to the outline of the main portion of openings 12, while the lower portion of plates 14 matches the slot portions 16 of opening 12. When connector means 13, 14, 14' are placed in the openings 12, 15, as shown in FIGS. 4 to 6, the lower portion of the tubular part 13 fits into opening 15 so that the connector means is supported in a position in which the lower portion of connector part 14, and the projecting parts 14' are substantially uniformly spaced from the inner surface of opening 12 and slot portions 16. The bent upper portions of connector parts 14 are located outside of openings 12.

Due to the non-circular outline of connector part 14, the connector cannot turn substantially in the non-circular opening 12, 16.

When two connector means have been set in openings 15, 12, 16, the openings 12, 15 are filled with epoxy resin in a deformable condition so that the connectors 13, 14, are permanently anchored in the insulator body 10 when the resin solidifies. Since the projections 14' transversely project in the openings, and are located below the upper edge of the openings 12, they are covered by the resin, as best seen in FIG. 5, so that it is not possible to lift the connectors out of the openings 12.

When the connector supporting housing cover is thus completed, the thin walls between openings 15 and 15a are removed by drilling from the inner surface of the cover, so that the wire ends of conductors 18 can be inserted into the tubular connector parts 13, and soldered to the top end of the same. Conductor 18 may lead to the ends of a coil located in the housing 20 whose upper edge portion is crimped about a flange portion of insulator body 10 so that an air and liquid tight construction of the housing is obtained. In this assembled position of the device, recesses 12, 15 and 15a form an opening through the insulator body 10 which has a wider portion 12 on one side of the body and a narrower portion 15, 15a on the other side.

Since the connectors are permanently secured to the insulator body 10 after the same has been pressed, the difficult operation of setting the connector bodies in the press mold before insulator body 10 is pressed, is eliminated.

It will be understood that each of the elements described above or two or more together, may also find a useful application in other types of connector supporting insulating bodies differing from the types described above.

While the invention has been illustrated and described as embodied in a housing cover comprising a pressed insulator body, and connectors embedded in the same,

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it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed and desired to be secured by Letters Patent is:

1. A housing cover comprising, in combination an insulator cover body having a plurality of openings, each opening having a cylindrical portion and a non-circular portion; a plurality of connector means located in said openings, each connector means including a tubular part located in said cylindrical portion and a non-circular part located in said non-circular portion of the respective opening and matching the same so that said connector means is non-turnable in the respective opening; and an insulating material having a condition adapted to be placed in said opening about said connector means and a rigid condition, and being located in said openings in said rigid condition so that said connector means are anchored by said projecting means in said insulator cover body.

2. A housing cover comprising, in combination, an insulator body having a plurality of openings, each opening having a cylindrical portion and a non-circular slot portion; a plurality of connector means located in said openings, each connector means including a tubular part located in said cylindrical portion and a plate part having projecting means at least partly embracing said tubular part, said plate part being located in said non-circular slot portion of the respective openings and matching the same so that said connector means is non-turnable in the respective opening, said projecting means transversely projecting in the respective opening; and an insulating material having a condition adapted to be placed in said opening about said connector means and a rigid condition, and being located in said openings in said rigid condition so that said connector means are anchored by said projecting means in said insulator cover body.

3. A housing cover comprising, in combination, an insulator body having a plurality of openings, each opening having a cylindrical portion and a non-circular slot portion; a plurality of connector means located in said openings, each connector means including a tubular part located in said cylindrical portion and a plate part having projecting means at least partly embracing said tubular part, said plate part being located in said non-circular slot portion of the respective openings and matching the same so that said connector means is non-turnable in the respective opening, said projecting means transversely projecting in the respective opening; each plate part having a connector portion bent away from said tubular part and projecting out of the respective openings so as to be adapted to be connected to a conductor; and an insulat-

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ing material having a condition adapted to be placed in said opening about said connector means and a rigid condition and being located in said openings in said rigid condition so that said connector means are anchored by said projecting means in said insulator cover body.

4. A housing cover as claimed in claim 3 wherein said non-circular portion of each opening extends to the outer surface of the cover, and wherein said cylindrical portion of each opening extends to the inner surface of said cover; and a wire connector passing into said cylindrical portion and through said tubular part, and being secured to the latter.

5. A housing cover as set forth in claim 3 wherein said projecting means of said plate part includes a pair of bent projecting portions of said plate part tightly embracing said tubular part for holding the same in a position abutting said plate part; and a soldered connection securing said tubular part to said projecting portions.

6. In a device of the type described, in combination, a pressed insulator body formed with at least one recess having a cylindrical portion and a non-circular portion; a connector means having a tubular part located in said cylindrical portion, and a non-circular part located in said non-circular portion of said opening and matching the same so as to be non-turnable; and a material located in said opening and embedding said non-circular part of said connector means so that the same is permanently secured to said insulator body, said connector means having a part projecting from one side of said insulator body and adapted to be connected to a first conductor and said tubular part being adapted to receive a second conductor passing through said cylindrical portion of said opening into said tubular part.

7. In a device of the type described, in combination, an insulator body formed with at least one opening having a narrower portion and a wider portion located on opposite sides of said insulator body, at least one of said portions being non-circular; a connector means having a first part fitting into said narrow portion and a second part located in said wider portion of said opening, said first part of said connector means being located in said narrower portion of said opening and supporting said connector means in a position in which said second part thereof is spaced from the inner surface of said wider portion of said opening; and a material having a rigid condition and deformable condition adapted to be placed in said wider portion of said opening about said second part of said connector means, and being located in said wider portion of said opening in said rigid condition so that said connector means is anchored and permanently embedded in said insulator body.

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