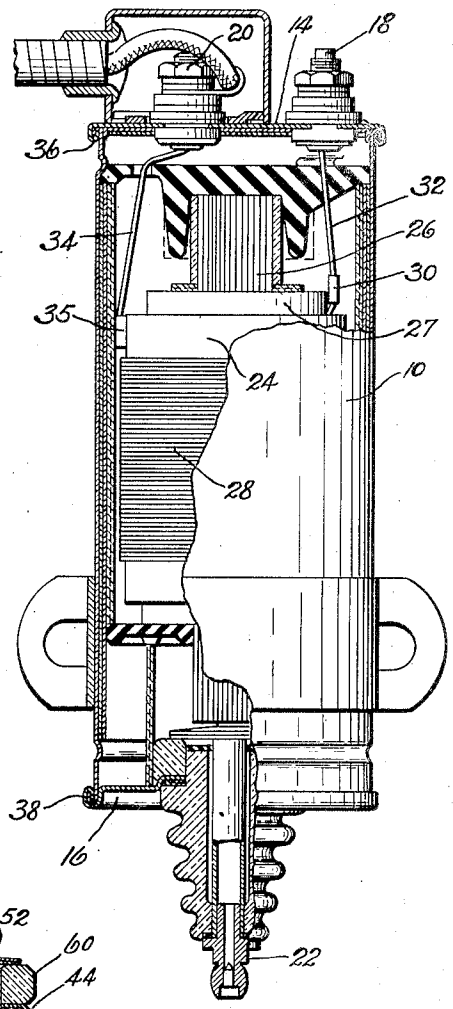
Aug. 15, 1944. H. L. HARTZELL 2,355,864

IGNITION COIL

Original Filed Sept. 28, 1939

Fig. 1



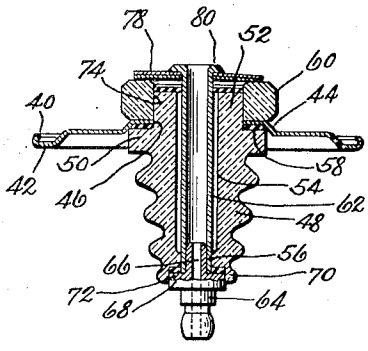


Fig. 2

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IGNITION COIL

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Original application September 28, 1939, Serial No. 296,906. Divided and this application February 5, 1942, Serial No. 429,677

1 Claim. (Cl. 174—153)

This invention relates to ignition coils for automotive use, and is concerned particularly with oil or wax impregnated coils, or those coil bodies that are rigidly secured within a casing that is hermetically sealed to insure against fluid flow through any of the junctures of the enclosing casing or through any of the circuit terminal mountings. The instant application is a division of a copending application S. N. 296,906 to Herman L. Hartzell and Dalphin L. Hittle for Ignition coil, filed September 28, 1939 patented May 19, 1942, as 2,283,733 and relates to terminal structure suitable for coils disclosed in the copending application of Herman L. Hartzell, Serial No. 296,904 filed September 28, 1939, which issued August 24, 1943 as 2,317,784.

It is an object of the present invention to provide certain improvements in the type of coil disclosed in the Hartzell application referred to, with the aim to reduce the cost of manufacture of coils having fluid tight enclosures, in which the coil body can be properly located so that the impregnant may be introduced through a terminal structure, later sealed, and by which the impregnant can reach all parts of the enclosure and the voids of the assembly.

A further object of the invention is to improve the means for providing a fluid tight seal between the coil container of thin sheet metal and the high tension terminal of porcelain.

A further object is to provide a terminal structure for mounting in an aperture of a thin walled sealed casing member, and which will accomplish a seal against fluid flow through the mounting.

Another object is to provide a through terminal for a metallic wall member with insulating means for sealing the terminal support against fluid flow therethrough.

A still further object is to provide an insulated mounting for a through terminal on a casing, that will afford charging of the casing with an impregnant and sealing of the casing to prevent any leakage thereof though casing is subject to differentials of pressure within and without.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a view partly in elevation and partly in section, illustrating the instant invention substantially as indicated by the line and arrows 1—1 of Fig. 2.

Fig. 2 is an enlarged detail view in section showing the construction of one of the terminals.

With specific reference to the drawing, 10 refers to a sheet metal coil case having a longitudinal lock seam and being closed at each end by members 14 and 16. Member 14 supports circuit terminals as 18 and 20. End member 16 supports terminal 22. Enclosed within the casing is a coil assembly unit 24, including a bundle of core wires 26 supporting a secondary winding 27 and about which is wound a primary winding 28. A lead from the inside end of the secondary winding 27 is tucked in between the core wires 26 in the usual manner, and the outside secondary winding lead and the inside primary winding lead are twisted together and fastened by a clip 30, from which a lead 32 makes connection with the primary terminal 18. The outside end of the primary winding is joined to a lead 34 by a clip 35, and this lead is secured to the other primary terminal 20. The end members 14 and 16 may be secured to the ends of the case member 10, in any desired manner that will effect a sealed juncture, but it is preferred that this be accomplished by a double rolled seam incorporating a gasket of oil and heat resistant material, such as rubber or latex bonded cork. Seam junctures of that type are indicated at 36 and 38, by which the end members 14 and 16 are each secured to one end of the case 10. Contributing to that type of seam each of the end members initially has an open rolled edge 40 (Fig. 2), that is finally interlocked with the end of the case 10.

The specific construction of the end member 16 is illustrated in Fig. 2, where it will be seen that the member has a raised rim 42 bounding which is the open roll 40. Centrally of member 16 there is a depressed portion 44 that is apertured at 46 for reception of a high tension terminal insulator 48 having a flange 50. The insulator 48 is of porcelain or like material and terminates inside of the member 16 with a cylindrical portion 52, there being a longitudinal bore or passage 54 therethrough, which is reduced at 56, the outside end. A compressible gasket 58 of oil and heat resisting characteristics is disposed over the cylindrical portion 52 of the insulator and occupies a position between the flange 50 and the depressed portion 44 of the member 16. Then a ring 60 of porcelain or the like is placed over the cylindrical portion 52 of the insulator which it closely fits and is pressed against the inside surface or the bottom wall of the depression 44. The outside diameter of

the part 52 is of a dimension to closely fit the apertures of the member 16, the gasket 58 and the ring 60.

These parts 16, 48 and 60 are held in fluid tight relation by means of a terminal assembly consisting of a tubular member 62 in the outside end of which is secured a hollow terminal tip 64, which may be accomplished by hydrogen-brazing or the like. The tip 64 has a longitudinal bore 66 and an external annular shoulder or flange 68 which fits against the end of the tube 62 where it is secured in fluid tight relation by the brazing or otherwise. This terminal construction is inserted from the outside and through the bore 56 and 54 of the insulator so as to extend beyond the inside end of the cylindrical portion 52, a gasket 70 of oil and heat resistant material being disposed over the outer end of the tube 62 and against the flange 68, where it seats in an end depression 72 in the end of the insulator 48. Over the inside end of the tube 62 there is disposed a rigid insulating washer 74 that rests against the end of the cylindrical portion 52 and engages at its periphery the inside wall 76 of the insulator ring 60. The insulator 74 is of such rigidity as to hold the end of the tube 62 centrally of the ring 60 and thereby equalize the tension of the final assembly. To secure these parts resiliently in the assembled relation, one or more spring steel dished washers 78 are placed over the end of the tube 62 and pressed forceably against the end of the ring 60 where they are held until the end of the tube 62 is spun over as at 80 or otherwise expanded in a riveting relation to engage and compress the spring washers 78. That procedure somewhat flattens out the dished washers 78 and compresses the gaskets 58 and 70 into fluid tight relation between rigid parts of the assembly, and provides a tubular terminal member extending from end to end of the insulator 48, while insulatingly supporting the terminal member by the end member 16.

The high tension terminal member 22 being secured in this fashion, the end member 16 is placed over the end of the case 10 where the open roll 40 of the end member and the end of the case are secured together as indicated at 38 in Fig. 1. The partly closed casing is now ready for reception of the coil parts completing the assembly.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claim which follows.

What is claimed is as follows:

An electric terminal for through mounting in a metallic case member having an aperture therein, the combination comprising, a tubular insulator having a stepped bore and a radial exterior flange near one end to provide a cylindrical shouldered extension adapted to extend through the case aperture, a sealing gasket of heat and oil resistant material carried by the cylindrical portion of the insulator and disposed between the shoulder of the flange and the case member, an insulator ring surrounding the cylindrical extension of the tubular insulator and disposed against the case member, a conductive element extending throughout the length of the tubular insulator and having a radially extending portion anchored in the larger portion of the stepped bore, a gasket of heat and oil resistant material between the insulator and the said radial portion of the conductive element, a dished spring washer surrounding the other end of the conductive element and pressing peripherally against the said insulator ring, and means including an offset portion of the conductive element flexing the spring washer for compressing both said gaskets into sealing relation against oppositely disposed portions of the tubular insulator.

HERMAN L. HARTZELL.