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A. BRUEDER

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IGNITION COILS FOR INTERNAL COMBUSTION ENGINES

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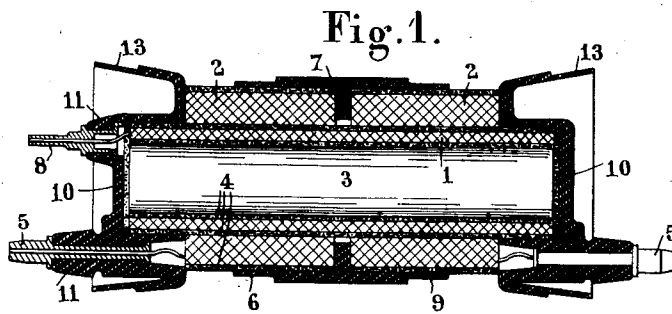


Fig. 2.

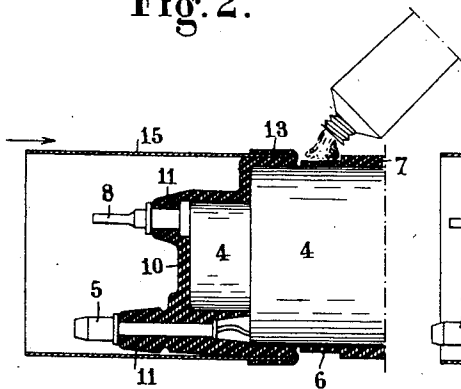


Fig. 3.

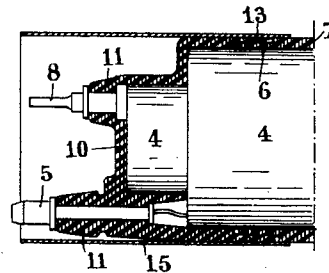
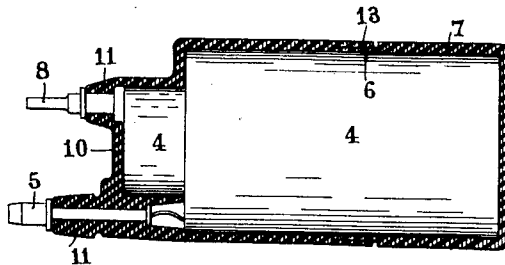


Fig. 4.



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2 Claims. (Cl. 336—90)

The present invention relates to internal combustion ignition coils and more particularly to the provision thereon of a resilient, strong sheath for insulating the windings, and inlet and outlet terminals thereof. The invention also relates to the method of fitting this insulating sheath on the coil.

It has already been suggested to replace the hitherto conventional sheet metal tubular container of ignition coils with a rigid sheath of opaque or transparent plastic or thermoplastic material, or other insulating material, and to encircle the sheath with ring members for connection with the terminal block or blocks which as a rule is of thick material such as "bakelite."

Another suggestion consisted in screening the windings by interposing between the container and windings a shroud consisting of an insulating casing with a view of reinforcing the efficiency and useful life of the coil.

It is the essential object of this invention to provide an ignition coil of the induction type for internal combustion engines, wherein the entire coil is enclosed in a sheath of a resilient, insulating, yielding and highly-dielectric material such as synthetic rubber, neoprene, nylon, etc. Preferably, the sheath according to the invention consists of a plurality of components, that is, a sleeve member designed to sheath the windings and one of two end-pieces adapted to fit round the edge or edges of the sleeve member, the end-piece or pieces being formed with projections corresponding to the inlet and outlet terminals of the windings.

The ignition coil according to this invention has a high impact strength, is resistant to atmospheric and other detrimental external agents and is highly insulating, fluid-tight and flexible; its construction is much simplified and the use of covers, assembling rings and other parts, which frequently are a source of breakdowns, are completely dispensed with.

The method of manufacturing ignition coils according to this invention consists primarily in forcibly threading a resilient insulating sleeve on the insulating tubular member that contains the windings, up to a certain distance from the end of the tubular member; preferably, the edge portion or portions of this sleeve member are thinner than the remaining portion of the member; then, the coil is capped with an end-piece of same material as the sleeve member; possibly, the edge-portion of this end-piece is thinner than the other parts thereof, the relative arrangement of the thinner edge portions of the sleeve member and end-piece being such that the edge portion of the end-piece may overlap the corresponding edge portion of the already positioned sleeve member so as to form a single continuous outer surface therewith.

This overlapping fitting of the end-piece may be effected by means of a cylindrical fitting tube in which the end-piece is placed with the thinner edge portion upturned over the edge portion of the fitting tube.

The assembling is effected in a drying oven by cementing the edge portions of the end-piece and sleeve member after turning down the edge portion of the end-piece.

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The accompanying drawing forming part of this specification illustrates diagrammatically by way of example two forms of embodiment of the invention. In the drawing:

5 Figure 1 is a longitudinal section of an ignition coil with its sleeve member and a pair of end-pieces prior to the definite fitting of the latter for completing the insulating sheath;

10 Figure 2 is a fragmentary part-sectional view of the coil during a further step of the assembling thereof;

Figure 3 shows the completion of the stop illustrated in Figure 2, and

Figure 4 is a part-sectional view of a modified embodiment.

15 Referring to the drawing and particularly to Fig. 1 thereof, the coil illustrated by way of example is of the twin secondary-terminal type comprising a core 3 and primary and secondary windings 1 and 2 respectively, both of which are separated and surrounded by "bakelite" board tubular members 4.

On the outermost tubular member is forcibly threaded a sleeve member 7 of insulating resilient material the circular edge portions 6 and 9 of which are thinner than the remaining or body portion of the sleeve member; the latter extends to within a certain distance from the edges of the cylindrical coil structure. Then, on either side of this cylindrical structure an end-piece 10 is fitted as shown. This end-piece 10 consists of a molded part of same material as the sleeve member 7, is formed with projections 11 for receiving the high- and low-tension terminals such as 5 and 8 of the coil, and a circular edge portion 13 thinner than the remaining parts of the end-piece. For fitting the end-piece 10 over the corresponding end of the coil the end-piece is placed into a cylindrical fitting tube 15 (see Figure 2) with the thinner edge-portion 13 upturned over the edge portion of the fitting tube 15. Then the latter is threaded on the corresponding coil end and the edge portion 13 of end-piece 10 is turned down to overlap the mating edge portion 6 or 9 of sleeve member 7, preferably in a drying oven, this operation being completed if desired with a cementing or vulcanizing step (see Figs. 2 and 3).

Thus, the coil body is completely enclosed in a continuous sheath of yielding and insulating material.

45 The sleeve member 7 may have a cylindrical shape and a closed bottom, as in the modified embodiment of Figure 4.

The methods of assembling the various components of the sheath vary according to the material used.

50 A preferred material for manufacturing the sheath of this invention is neoprene because it is one of the rare materials having the required resiliency, strength, dielectric rigidity and resistance to solvents.

What I claim is:

55 1. High-tension electrical device having a cylindrical case and at least one terminal projecting from at least one end, and a sheath of flexible, elastic, oxidation-resistant insulating material encapsulating said device, said sheath comprising an elongated sleeve portion of said material surrounding and resiliently fitting on said cylindrical case and having an annular marginal end portion of reduced thickness, and at least one end cap of said material comprising an end-covering portion and an integral peripheral skirt portion, said end portion covering 60 an end of said device and having at least one integral projecting portion tightly surrounding said terminal and said integral skirt portion surrounding and resiliently fitting on said cylindrical case and having an annular marginal portion of reduced thickness overlapping said marginal end portion of said elongated sleeve portion and adhered thereto to provide an overlapped joint, said sheath fully enclosing and hermetically sealing said unit,

2. High-tension electrical device having a cylindrical case and at least one terminal projecting from each end, and a sheath of flexible, elastic, oxidation-resistant and shock-resistant insulating material encapsulating said device, said sheath comprising an elongated sleeve portion of said material closely surrounding and resiliently fitting on said cylindrical case intermediate its ends, said sleeve having at each end an annular marginal portion of reduced thickness and a pair of end caps of said material, each of said caps comprising an end-covering portion and an integral, peripheral skirt portion, said end portion covering the respective end of said device and having at least one integral projecting portion tightly surrounding said terminal and said integral skirt portion surrounding and resiliently fitting on said cylindrical case and having an annular marginal portion of reduced thickness overlapping the respective marginal portion of said elongated sleeve portion

and adhered thereto to provide an overlapped joint, said sheath fully enclosing and hermetically sealing said unit.

References Cited in the file of this patent

UNITED STATES PATENTS

1,569,101	Vaughn	Jan. 12, 1926
1,748,650	Hollenbeck	Feb. 25, 1930
1,854,401	Fitzsimmons	Apr. 19, 1932
1,998,378	Mallory	Apr. 16, 1935
2,460,903	Peck	Feb. 8, 1949
2,512,796	Hartzell	June 27, 1950
2,706,742	Ehlers	Apr. 19, 1955

FOREIGN PATENTS

290,820	Great Britain	May 24, 1928
439,081	Great Britain	Nov. 28, 1935