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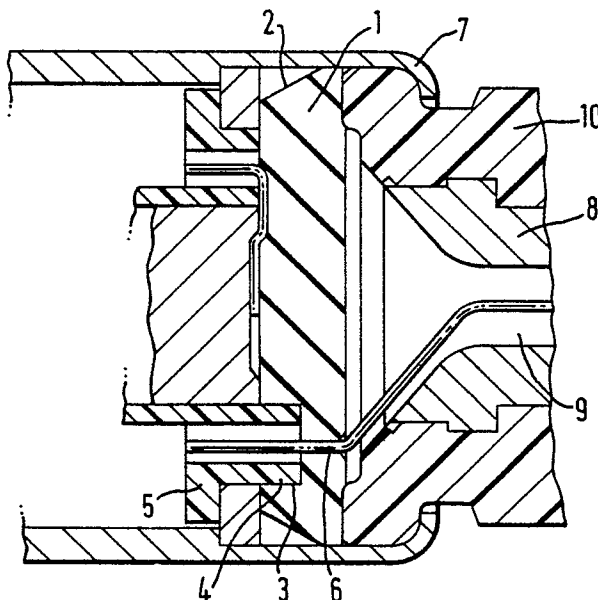
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(54) Solenoid seal.

(57) An airtight seal for the end of a solenoid, takes the form of a plug (1) of deformable material which fits into the end of the solenoid, and is deformable on attachment of a terminal assembly, (8,10,11,13) into airtight sealing engagement with the surrounding parts (7,5,14) of the solenoid, the plug being pierced in situ for the passage of the end wire (6) of the solenoid.

FIG. 1.



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## "Solenoid Seal"

This invention relates to means for sealing solenoids against the passage of air and its principal object is to provide a relatively simple form of seal which can be used with very small mass-produced solenoids and is effective over a wide range of temperatures.

To this end, according to the invention, there is provided a plug made of synthetic rubber or other suitably deformable material which is fitted into the end of a solenoid, is deformed, by attachment of a terminal assembly, into sealing engagement with the surrounding parts of the solenoid and is only traversed by the end wire of the winding passing through a hole which is pierced at the time of insertion of the wire.

A preferred form of seal is illustrated, by way of example, in the accompanying drawing, in conjunction with alternative types of terminal assembly shown in longitudinal section of Figures 1 and 2. In each case, the seal takes the form of a circular plug or diaphragm 1 having a tapered peripheral wall 2 and a recess 3 at its inner end to receive and locate a hollow projection 4 at the end of the bobbin 5 through which the start wire 6 of the solenoid winding passes. The plug 1 which is made of synthetic rubber, is fitted into the end of the solenoid casing 7 and the start wire 6 is passed through the plug in a hollow needle which is used to pierce a hole which, upon withdrawal of the needle, closes tightly on the wire. It is thus possible to use wires 6 of different diameters with the same seal since it is unnecessary to provide preformed holes. Attachment of a terminal assembly of the kind shown in Figure 1 in which a brass terminal 8 having a central bore 9 for the passage of the wire 6 is carried by a terminal moulding 10, or of the kind shown in Figure 2 in which the wire 6 is soldered at 11 to a brass terminal tag 12 carried by a terminal moulding 13, serves to deform the plug 1 into tight sealing engagement with the mating portions of the casing 7, bobbin 5 and armature 14 to effectively prevent the passage of air under pressure or vacuum through the solenoid.

The seal according to the invention is capable of use in small solenoids of about 13 mm diameter in which there is very little space in which to use multiple seals, is capable of withstanding temperature cycling between -40°C and + 100°C, including thermal shocks and makes it unnecessary to employ liquid adhesive type seals which are difficult to apply using mass production techniques.

## Claims

1. An airtight seal for the end of a solenoid, characterised in that the seal comprises a plug (1) of deformable material for fitting into the end of the solenoid, said plug being deformable, on attachment of a terminal assembly (8-10,11-13) into air tight sealing engagement with the surrounding parts (7,5,14) of the solenoid and capable of being pierced in situ for the passage of the end wire (6) of the solenoid.
2. A seal according to claim 1, wherein the plug (1) is made of synthetic rubber.
3. A seal according to claim 1 or 2, wherein the plug (1) is circular.
4. A seal according to any one of claims 1 to 3, wherein the plug (1) has a tapered peripheral wall (2).
5. A seal according to any preceding claim wherein the plug (1) is provided with a recess (3) at one end to receive and locate a hollow projection (4) provided on the solenoid bobbin (5) for the passage of the start wire (6)
6. A solenoid provided with an airtight end seal in accordance with any preceding claim in the form of a plug interposed between one end of the solenoid and its terminal assembly (8-10,11-13), deformed by said terminal assembly into air-tight sealing contact with the casing (7), bobbin (5) and armature (14) of the solenoid and only traversed by the start wire (6) of the solenoid winding passing through a hole which is pierced at the time of insertion of and closes around the wire (6)
7. A method of sealing one end of a solenoid comprising inserting a deformable plug (1) into the end of the solenoid casing (7), piercing a longitudinal hole in the plug and passing the start wire (6) of the solenoid therethrough and inserting the inner end of a terminal assembly (8-10,11-13) under pressure into the casing, whereby the plug is deformed into air-tight sealing engagement with the adjacent parts (7,5,14) of the solenoid and the wire (6).
8. A method according to claim 7, wherein the hole in the plug (1) is pierced by a hollow needle which carries the start wire.

FIG. 1.

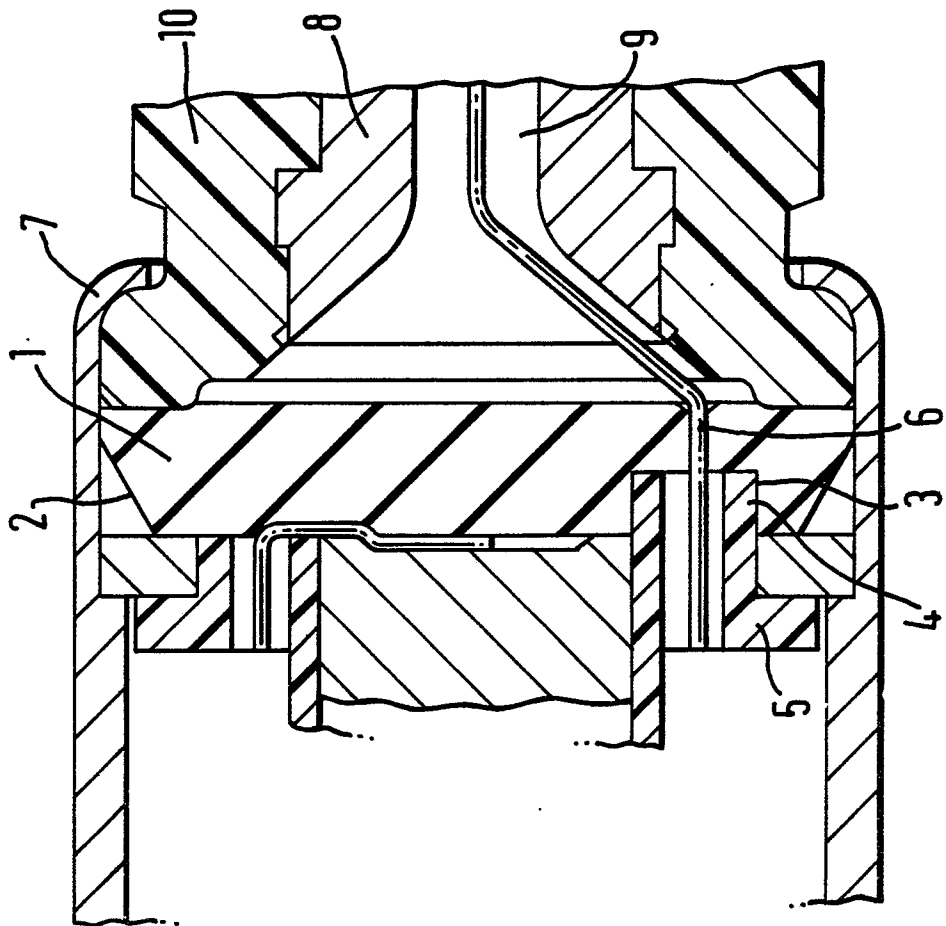


FIG. 2.

