Sept. 26, 1939. J. T. FITZSIMMONS 2,174,081

DISTRIBUTOR HEAD ASSEMBLY

Filed Feb. 8, 1939

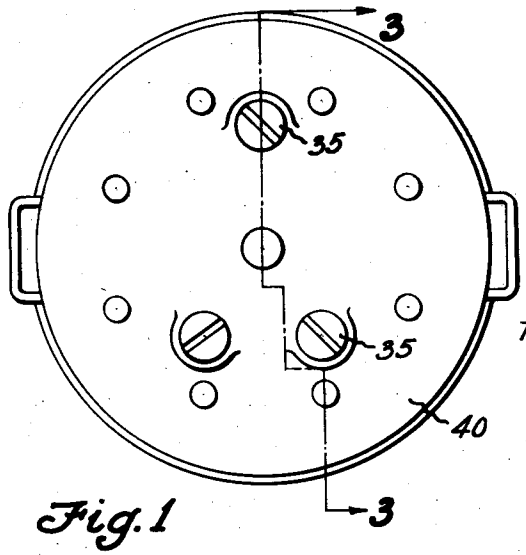


Fig. 1

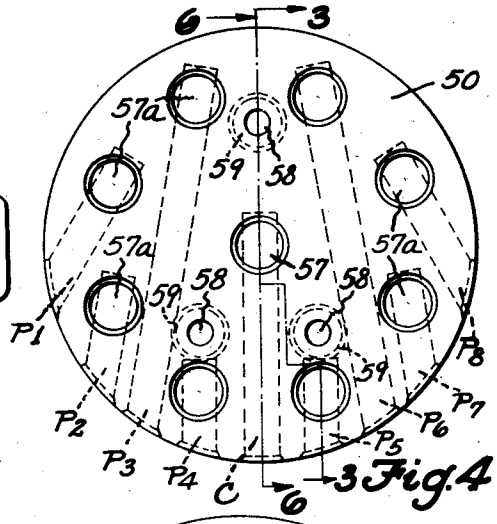


Fig. 4

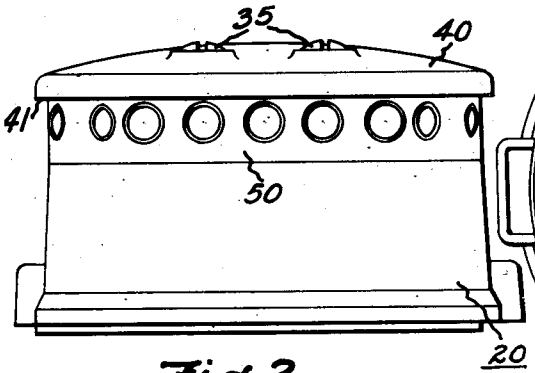


Fig. 2

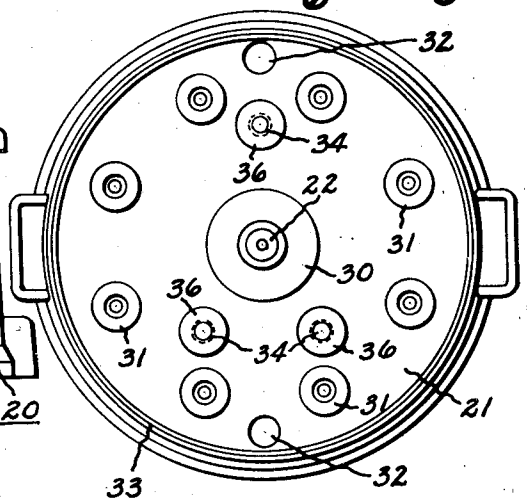


Fig. 5

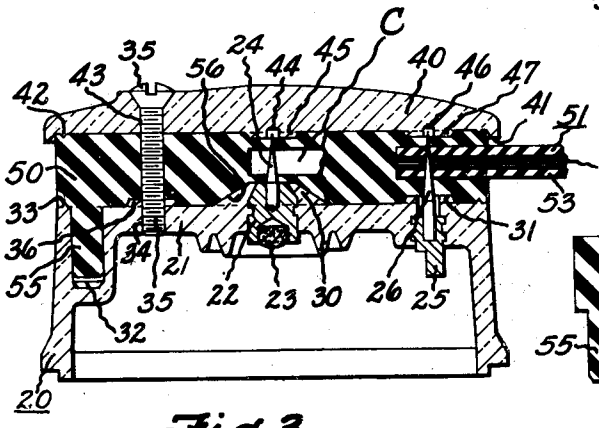


Fig. 3

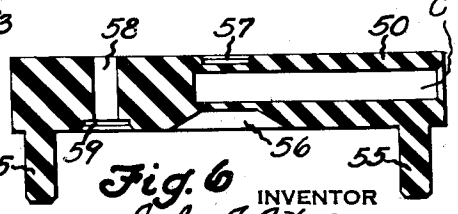


Fig. 6

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Patented Sept. 26, 1939

2,174,081

UNITED STATES PATENT OFFICE

2,174,081

DISTRIBUTOR HEAD ASSEMBLY

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Application February 8, 1939, Serial No. 255,205

4 Claims. (Cl. 200—19)

This invention relates to distributor heads or caps for use with ignition distributing apparatus particularly for use on automotive vehicles where the ignition distributor is frequently subjected to contact with moisture.

It is an object of the present invention to provide a distributor cap having moisture proof connection with the spark plug cables and with the cable leading from the center terminal of the distributor cap to the ignition coil. According to the present invention I accomplish this object by providing a block of soft rubber which I clamp between the exterior top surface of the distributor cap and the inner surface of the distributor cap cover. Hereinafter I term this soft rubber body the lead seal disc. The lead seal disc is provided with passages extending parallel to the bottom and top surfaces of the disc. Each of these passages receive an end of an insulated cable. The internal diameter of each of the passages is such that the cable will fit snugly into the passage. I provide the center terminal insert in each of the distributor posts insert with a pointed metal piece or needle which is capable of piercing through the rubber and also through the insulation of the cable as well as entering in between the strands of wire of the cable. I so shape the top surface of the distributor cap and the bottom surface of the cap cover with respect to the lead seal disc that, when the cover is clamped by means of screws down against the lead seal disc and the disc is clamped against the top surface of the distributor cap, the disc will be compressed in such manner as to cause the rubber thereof to bind tightly around each of the insulated cables. In this way, I am able to provide the moisture proof connection between each of the cables and each of the metallic inserts molded in the distributor cap.

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 top view of a distributor cap, lead seal disc and cover assembly constructed in accordance with the present invention.

Fig. 2 is a side view thereof.

Fig. 3 is a longitudinal sectional view taken approximately on the section line 3—3 of Fig. 1 and Fig. 4.

Fig. 4 is a top plan view of the lead seal disc.

Fig. 5 is a top plan view of the distributor cap.

Fig. 6 is a sectional view of the lead seal disc, this section being taken approximately on the line 6—6 of Fig. 4.

In the drawing numeral 20 designates the distributor head or cap molded of Bakelite. Its top wall 21 carries a center terminal insert 22 provided with a metal or carbon button 23 adapted to be engaged by a resilient contact carried by the distributor rotor, not shown. Insert 22 carries a cable piercing conductor or needle 24. The wall 21 of cap 20 carries a plurality of distributor posts 25 past which the segment on the distributor rotor moves to distribute sparking impulses to the various engine spark plugs in recurrent sequence. Each distributor post insert 25 carries a cable piercing conducting needle 26. The distributor cap wall 21 provides a conical boss 30 surrounding the center insert 22. Surrounding each of the cable piercing needles 26, the wall 21 provides an annular boss 31. Cap 20 is provided with diametrically oppositely located recesses 32, for a purpose to be described. Cap 20 is provided with a relatively sharp edged annular boss 33. Cap 20 is provided with three tapped or threaded holes 34, each for receiving a screw 35. Surrounding each of the tapped holes 34, the distributor cap wall is provided with an annular boss 36.

Numeral 40 designates the cap cover. Cover 40, like the cap 20, is molded of Bakelite or equivalent material. Cap 40 is provided with a depending annular flange 41 and with a relatively sharp edged annular boss 42. Cap 40 is provided with plain openings 43 for receiving the clamping screws 35. Centrally thereof the cover 40 is provided with a small recess 44 to provide clearance for the pointed end of the needle 24. Surrounding the recess 44, the cover provides an annular boss 45. In alignment with each of the cable piercing needles 26, the cover 40 provides a small recess 46 to provide clearance for the end of a needle 26. Surrounding each of the recesses 46, the cover 40 provides an annular boss 47. When the cover 40 is properly located with respect to the cap 20, each of the bosses 47 will be in alignment with each of the bosses 31 of the cap 20. The central boss 45 of the cover 40 will be in alignment with the conical boss 30 of the top wall 21 of cap 20.

Numeral 50 designates the lead seal disc which is made of soft rubber. Disc 50 is provided with a plurality of cylindrical recesses marked P1 and P8, respectively. Each of these recesses receives a spark plug cable 51 comprising a core or wire 52 sheathed with rubber insulation 53 or the like. When the disc 50 is assembled with the cap 20 as shown in Fig. 3, each of the spark plug cable recesses P1 and P8 of the disc 50 will be traversed by a cable piercing needle 26. Disc 50 is provided also with a coil cable receiving recess C so located as to be traversed by the cable piercing needle 24 located centrally of the cap 20.

As shown in Fig. 6, disc 50 is provided with diametrically opposite lugs 55, which are received, respectively, by the diametrically opposite recesses 32 provided by the cap 20. In this way,

the disc 50 is located properly with respect to the cap. Because the disc 50 is made of relatively pliable material, its location centrally with respect to the cap 20 is assisted by the fact that the disc 50 is provided with a conical recess 56 which receives the central boss 30 of the cap 20. In alignment with its central conical recess 56, the disc 50 provides a central recess 57 (see Fig. 4) which receives the central boss 45 of the cover 40. Disc 50 is provided with three screw or bolt receiving holes 58 each of which is associated with a recess 59 (see Fig. 4) which receives a boss 36 which surrounds the tapped hole 34 into which one of the bolts 35 is screwed.

Before the lead seal disc 50 is assembled with cap 20 and the cover 40 as shown in Fig. 3, the spark plug cables 51 are threaded into the various recesses P1 to P8 of the disc 50, and the ignition coil cable, not shown, is threaded into the recess C. Care must be taken that these cables are pushed into their respective recesses as far as possible. Then the lead seal disc with all of the cables assembled therewith is assembled with the cap 20 and the cover 40 as shown. The three bolts 35 are inserted through the cover 40 and the disc 50 and are screwed into the cap 20, thereby causing the disc 50 to be squeezed between the cap 20 and the cover 40. The act of assembling the disc 50 with the cables attached with the cap 20 causes each of the cable piercing needles 24 or 26 to pierce through the cable which has been previously entered into the associated recess. The needle 24 will pierce through the disc 50, through the insulation of the cable and will enter between the stranded wires of the cable C. Likewise each of the needles 26 will pierce through the disc 50, through the insulation of the cable 51 and will enter between the stranded wires 52 of the cable 51. The act of screwing down the bolts 35 assists in causing each of the cable piercing needles to perform its function. The screwing down of the bolts 35 causes the lead seal disc 50 to be squeezed between the cap 20 and the cover 40. These sharp edged annular bosses 33 and 42 of the cap and cover respectively, pinch the disc 50 near its outer periphery and thus provides a seal which effectively blocks off the creepage of moisture between the contiguous surfaces of the cap 20 and disc 50 and the contiguous surfaces of the cover 40 and disc 50. It will be noted that the disc 50 is provided with preformed recesses 57a (see Fig. 4) for receiving the annular bosses 31 and 47 of the cap 20 and cover 40 respectively. The screwing down of the bolts 35 causes the bosses 31 and 47 to be forced into the lead seal disc 50 thus displacing its material causing it to be compressed around the insulation 53 of each of the spark plug cables 51. Since all of the spark plug cables 51 as well as the ignition coil cable are brought out from the lead seal disc 50 on the same side, it will be apparent that the displacement of material of the disc 50, in the manner referred to, will also effect displacement of material of the disc 50 in a region adjacent to the ignition coil cable entered in the recess C. Therefore the material of the disc 50 will be squeezed around the ignition coil cable.

From the foregoing description of construction and manner of assembling a distributor cap 20, lead seal disc 50 and cover 40 embodying the present invention, it will be apparent that I have provided an effective and economically constructed means for providing a water-proof connection between each of the distributor cables and each of the inserts with which the cables are intended to be electrically connected.

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 claims which follow.

I claim:

1. A distributor head assembly for ignition apparatus comprising a non-conducting cap having a central metallic insert for connection with an ignition coil cable or lead and a circular row of metallic inserts for connection, respectively, with spark plug cables or leads, and having pointed metal pins each attached to an insert and extending beyond the cap, a cap cover, a lead seal disc of pliable non-conducting material such as soft rubber located between the cap and cap cover for occupying the space between them, said disc being provided with cable or lead receiving recesses each of such shape and dimensions as to snugly fit a cable and to permit, prior to assembly of the disc with the cap and cover, a cable to be pushed into it far enough to locate an end portion of a cable in alignment with a pointed pin when the parts are assembled, whereby the pressing of the disc against the cap causes each pin to pierce the disc, the insulation of a cable and to extend through and in contact with wire strands of the cable, and means for securing the cap, disc and cover in assembled relation and for clamping the disc between the cap and cover.

2. A distributor head assembly according to claim 1 in which the cap and cover are provided with oppositely disposed annular ridges which bite into the disc when the parts are assembled.

3. A distributor head assembly according to claim 1 in which the cap and cover are provided with oppositely disposed pairs of annular bosses, each pair surrounding a pin, and in which the disc provides recesses receiving said bosses.

4. A distributor head assembly for ignition apparatus comprising a non-conducting cap having a central metallic insert for connection with an ignition coil cable or lead and a circular row of metallic inserts for connection, respectively, with spark plug cables or leads, a cap cover, a lead seal disc of pliable non-conducting material such as soft rubber located between the cap and cap cover for occupying the space between them, said disc being provided with cable or lead receiving recesses each of such shape and dimensions as to snugly fit a cable and to permit, prior to assembly of the disc with the cap and cover, a cable to be pushed into it far enough to locate an end portion of a cable in alignment with an insert when the parts are assembled, means for electrically connecting each cable end with an insert, and means for securing the cap, disc and cover in assembled relation and for clamping the disc between the cap and cover.

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