

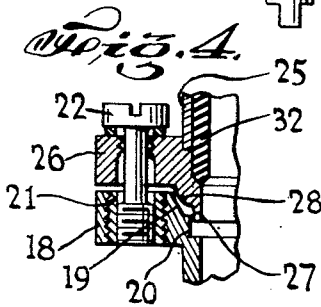
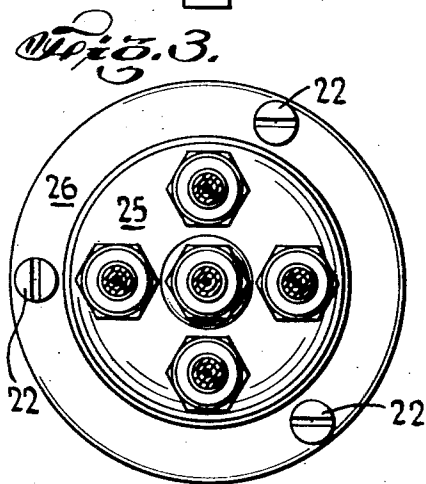
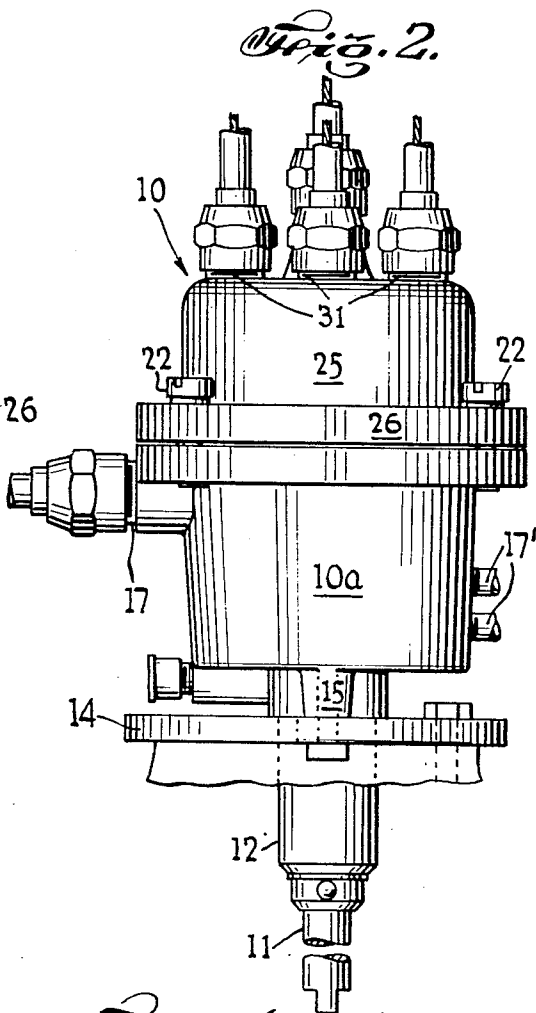
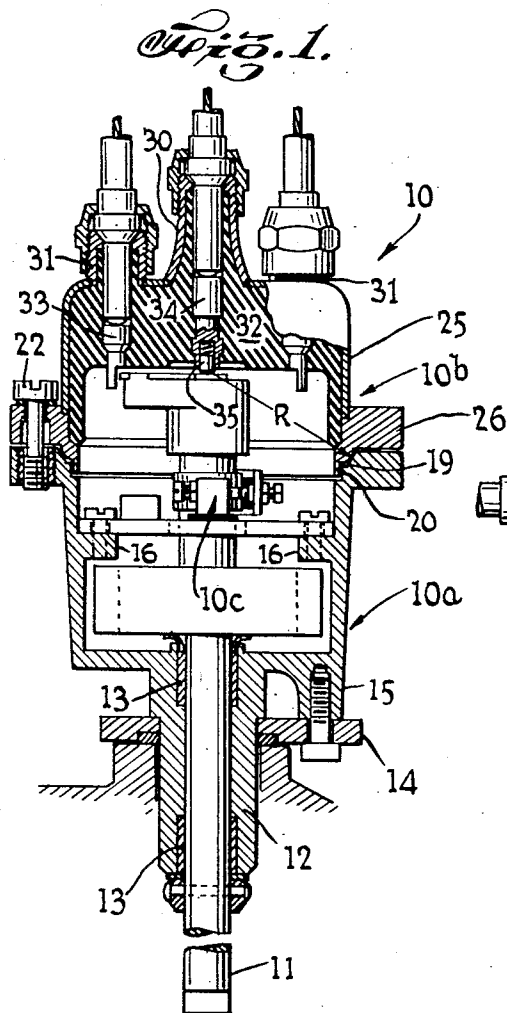
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2,574,698

AUTOMOTIVE DISTRIBUTOR

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AUTOMOTIVE DISTRIBUTOR

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2 Claims. (Cl. 200—19)

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This invention relates to improvements in automotive ignition distributors. In particular, the invention is directed to an improved radio shielding, water-proof distributor for internal combustion engines.

Metallic radio shielding covers have been employed for high tension electrical systems for internal combustion engines to prevent the emanation of radio frequency currents which would otherwise interfere with the reception of signals in a vehicle equipped with radio receiving apparatus. Waterproofing of electrical equipment is likewise desirable and has been used to ensure the continuity of operation of the vehicle's internal combustion engine, even though the vehicle may be operating under adverse conditions of weather or even partly submerged in water. Vehicles used in agriculture or for purposes of war are those most frequently subjected to such adverse operating conditions and, while radio shielding and waterproofing have been used in the past and are common automotive practice, no one has, to my knowledge, developed an entirely satisfactory distributor casing which is both radio noise free and water and moisture proof.

Accordingly, the principal object of my invention is to provide an ignition distributor for internal combustion engines which is substantially completely radio noise free and water and moisture tight.

It is a further object of my invention to provide a shielding and waterproof automotive distributor casing which may be readily opened for accessibility of the contained parts during maintenance or repair and which, when closed, will retain its shielding and waterproofing characteristics.

A further object of the present invention is to provide a shielding and waterproofing casing for a distributor which may be readily assembled and disassembled, and which may be easily fabricated with the use of conventional machine tools and conventional assembly techniques.

In the construction of the distributor of my invention, I utilize, in part, the base and cap construction of automotive ignition practice, the base carrying the moving parts driven from the engine with the usual accessories and the cap being of metal with molded insulation contained therein and fitted with means for wiring communication with the spark coil and individual shielded spark plugs. Provision is made whereby flexible or rigid shielding conduit may be detachably secured to the distributor, as is well known in the art, for wiring leading therefrom. The joint between the cap and the base section is, in part, a combined toroidal, conical arrangement whereby metallic line contact is made, and in this manner a completely effective shielding joint is assured as well as a completely waterproof joint. To provide equalized assembly pressure at the joint, I employ three holding or securing clamp

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screws which are spaced at slightly unequal angles about the periphery of the joint. In so arranging the clamping screws I also eliminate the possibility of fastening the cap to the base in an incorrect position, which would otherwise destroy the accurate timing of the distributor with the engine. Contacting metal members are preferably fabricated of material having low contact resistance, such as brass or hydraulic bronze in order to maintain a low joint resistance.

Further objects and advantages of the invention will be understood during a consideration of the following descriptive detail, taken in conjunction with the annexed drawings. While I show and describe a preferred embodiment of my invention, it will be understood that various changes may be made in the size and shape and material of the component parts in order to adapt the invention to various sizes and styles of internal combustion engines, without departing from the scope of the invention as particularly pointed out in the sub-joined claims.

In the drawings,

Figure 1 is a vertical, cross-section view taken centrally through the distributor of my invention,

Figure 2 is an elevation view taken from the right hand side of the distributor of Figure 1,

Figure 3 is a top plan view of the distributor of Figure 1, and

Figure 4 is an enlarged fragmentary cross-section view taken at the distributor cap clamping screw of Figure 1.

Referring to the drawings, the distributor 10 of Figures 1 and 2 is of the usual proportions and style for a battery fed automotive ignition system comprising mainly the base member 10a and a cap member 10b which together form a closed housing or enclosure for an assemblage of distributor operating parts 10c. Inasmuch as my invention has to do principally with the distributor enclosure comprising base member 10a and cap member 10b, no comprehensive description is herein made of the operating elements 10c which include the usual condenser, breaker points, and distributor drive, these parts being well known expedients in ignition systems for internal combustion engines. Likewise, I avoid any extensive reference to the shielding conduit attached to the distributor and to other details of the electrical system and deal particularly with the details of construction of the shielding distributor enclosure wherein spark discharge and other radio frequency disturbances are confined.

The distributor base member 10a is an open top brass or bronze container having substantially vertical side walls and fitted with the usual distributor shaft 11 which extends downwardly through a depending boss 12 fitted with anti-friction bushings 13 for driving connection with the engine. A flat adjusting disc 14 secured to

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and gasketed with the engine casing is interposed between the casing and a shoulder on boss 12 and is adjustably fixed to boss 15 to permit angular adjustment to be made between the distributor and engine casing for advancing or retarding the spark timing. Suitable mounting lugs 16 are provided internally of member 10a whereby the operating elements 10c may be fixed in position. Lubrication of the lower bushing 13 takes place during the normal splashing of oil within the engine casing and lubrication for the upper bushing 13 is provided by means of the usual grease cup fitting. A threaded outlet 17 shown at the left side in Figure 2 permits shielded wiring attachment to the base member and a pair of smaller threaded outlets 17' at the right hand side provide for ventilating communication with the distributor interior.

The open top face of base member 10a is outlined with a flat marginal flange 18 which is internally chamfered and counter bored as at 19 and 20 respectively for purposes to be described. Three threaded inserts 21 are spaced about the periphery of flange 18, each having internally threaded bore for inter-connection with cap clamping screws 22, see Figure 3. The angular spacing between each consecutive pair of clamping screw inserts varies slightly in order that the cap portion 10b, when assembled therewith, may be placed in one angular position only.

The distributor cap 10b is constructed from a cup-shaped metal shell 25 to which is permanently fixed a brass or bronze ring 26, as by soldering or brazing. A depending shoulder or skirt 27 on ring 26 fits rather loosely into the counter-bored portion 20 of the distributor base to serve principally as a guide, and the flat face portion of ring 26 mates with the corresponding open face of the flange 18. Intermediate of the flat faced portion of the ring 26 and shoulder 27 is a convex toroidal fillet 28 which bears against the chamfered seat 19 in base 10a when the base and cap are assembled. Thus, we have the condition wherein a curved male surface mates with a tapered or chamfered female surface to provide peripheral line contact. In so constructing these parts it is possible to obtain high unit pressure between the respective surfaces for assurance of a perfect radio shielding and moisture sealing connection, even when the base and cap are slightly cocked with respect to each other. When the cap is not assembled with the base, shoulder 27 serves the additional purpose of protecting the fillet 28 against nicking or other handling damage. Furthermore, there is a wiping action during assembly thereof which tends to break down any film which may be present either on the cap or the base thus further enhancing the electrical connection therebetween.

At the top surface of the metallic cup portion 25 of cap 10b are a series of metal outlet elements, including a centrally located long outlet 30 for attaching shielded wiring from an ignition coil together with a series of shorter, radially disposed outlets 31 to which may be fastened suitable ignition shielding conduit for the wiring from the distributor to the individual spark plugs on the engine. Outlet 30, being located centrally within the cluster of outlets 31, is made longer to facilitate the use of a wrench or other tool used for attaching and detaching the conduit connectors. Outlets 30 and 31 may be joined with the cup shaped cap portion 25 in a similar manner to that used for fastening ring 26 thereto, as by soldering or brazing. When the ring and outlets are thus installed during the fabri-

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cation of the distributor cap, the cap is then partially filled with a molded di-electric material 32 in order to locate and embed the electrodes 33 for the spark plug wiring and the central connecting contact 34 for the coil connection. It will be noted here that contact 34 for the coil connection is elongated above its spring biased pin 35 so that it may be drilled away to provide an open space within which may be inserted a suppressor resistor or other electrical interference suppressor means, not shown.

By reason of the use of line peripheral contact for the mating of the distributor cap and base it is necessary to provide for slight cocking of these parts, as above mentioned. Thus, there must be some clearance between the skirt 27 and bore 20, also between the mating faces of flanges 18 and 26. Furthermore, since the clearance between the distributor arm and electrodes 33 within the distributor is slight, the angle of the chamfer 19 is made normal to a radius "R" from the point of contact pin 35 with the distributor arm. Any rocking movement will hence tend to separate the distributor arm from the electrodes very slightly and will avoid the possibility of mechanical interference during distributor operation.

Having thus described my invention, I claim:

1. In an ignition distributor of the class described for internal combustion engines, wherein is contained a rotatable contact distributor arm arranged to revolve adjacent a series of distributor electrodes, in combination, a metallic shielding base member having an internal conical, peripheral chamfer on its open face, and a metallic shielding cap member provided with a convex, peripheral surface arranged to mate with said conical surface at the assembly of said base and cap members, said conical surface being disposed at an angle normal to a line drawn thereto from the center of rotation of the distributor arm in the plane of the points of contact between the arm and the electrodes.

2. In an ignition distributor of the class described for internal combustion engines, wherein is contained a rotatable contact distributor arm arranged to revolve adjacent a series of distributor electrodes, in combination, a metallic shielding base member having an internal conical, peripheral chamfer on its open face, a metallic shielding cap member provided with a convex, peripheral surface arranged to mate with the conical surface on said base member at the assembly of said base and cap members, and means to clamp said cap and said base in mating contact, said conical, peripheral surface being disposed at an angle normal to a line drawn thereto through the center of rotation of the distributor arm in the plane of the points of contact between the arm and the electrodes.

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