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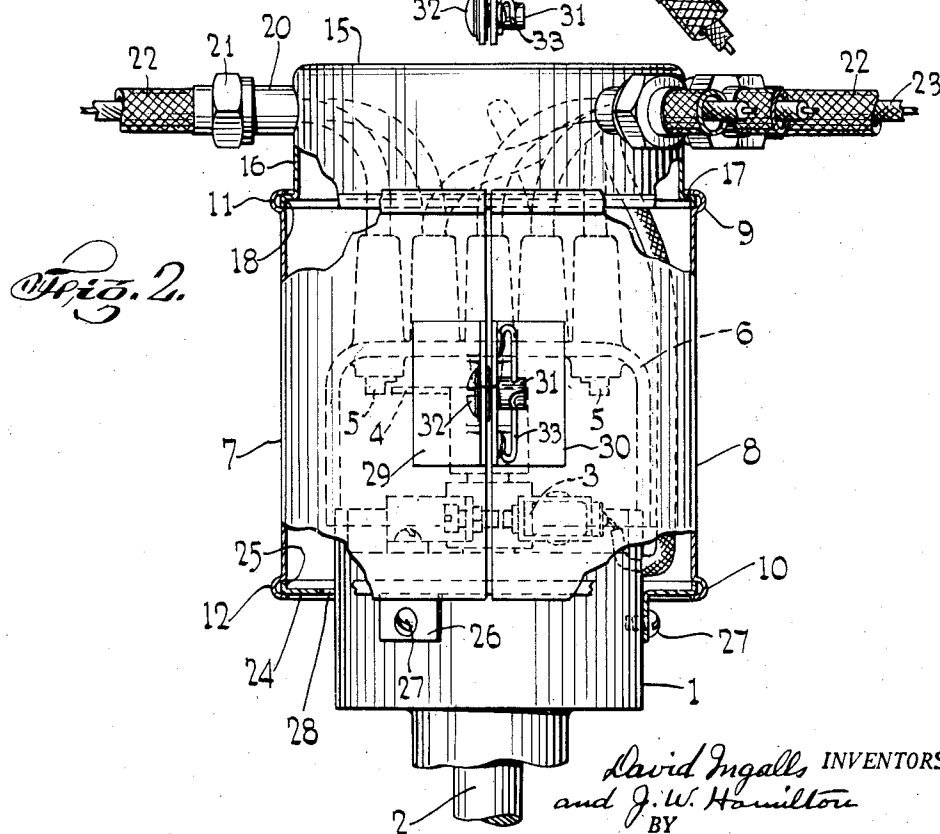
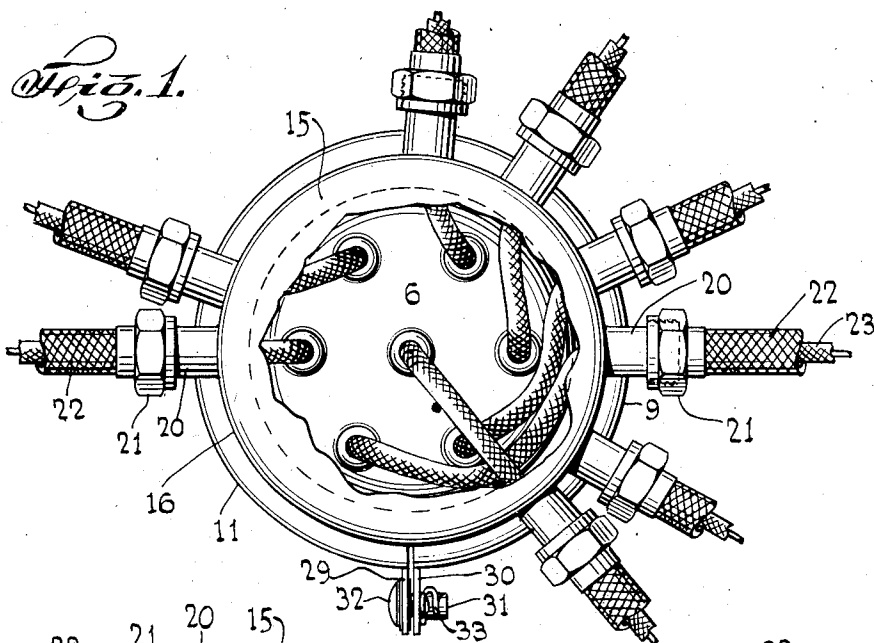
D. INGALLS ET AL

2,393,538

IGNITION DISTRIBUTOR RADIO SHIELD

Filed Feb. 14, 1942

2 Sheets-Sheet 1



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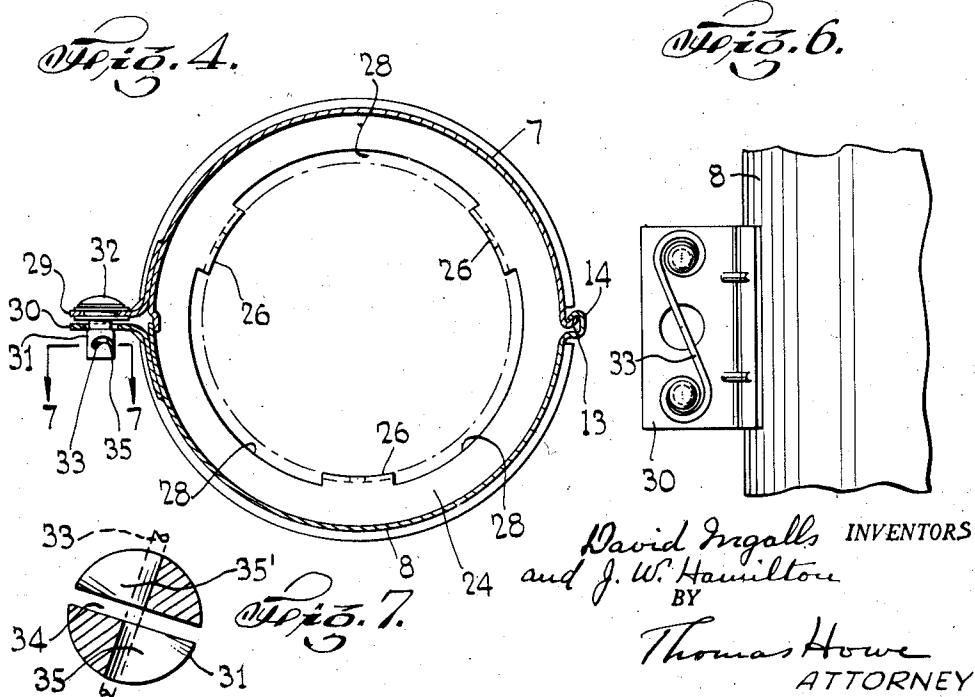
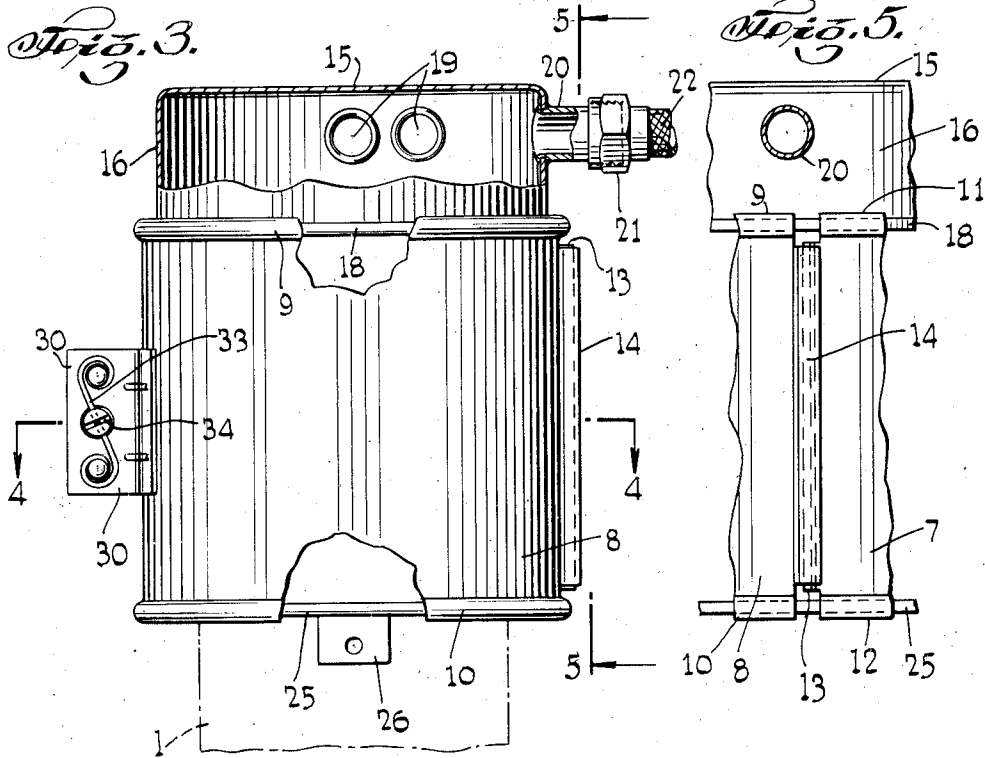
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UNITED STATES PATENT OFFICE

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IGNITION DISTRIBUTOR RADIO SHIELD

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8 Claims. (Cl. 200—19)

This invention relates to shielding of the distributors of the ignition systems of internal combustion engines whereby radio emanations from the distributor may be arrested at least to such extent that they will not unduly interfere with neighboring apparatus of radio transmission systems.

The making and breaking of the circuit of the distributor is a potent source of radio wave emanations and the shielding of the distributor is therefore of especial importance.

The main object of the invention is to provide an efficient radio shield for distributors and one which is readily manufactured and assembled.

The shield will ordinarily take the form of a metal housing for the distributor and this may also serve to protect the distributor from mechanical injury and exterior moisture. It is, therefore, a further object of the invention to provide a radio shield for a distributor which shall afford such protection.

In order that deleterious moisture may not collect or be present within the shield, it is desirable that the interior of the shield shall be ventilated, and it is a further object of the invention to provide a shield having means for such ventilation.

A further object of the invention is to provide joints between different parts of the shield which are formed by the resilient or spring pressure of the joint parts together so that good contact between the joint parts obtains at all times whereby good electrical connection between the joint parts exists and the joint is sealed against moisture.

The electrical connections between the joint parts of the shield, as just referred to, may be better realized if the contact surfaces are kept clean and also if there is a wiping action between the shield joint parts as they are assembled or in operation. It is, therefore, a further object of the invention to provide a shield composed of several parts, the joint between which are readily accessible for the cleaning of the contacting surfaces.

It is a further object of the invention to provide a shield comprising several parts wherein there is a wiping action between the contacting surfaces in the assembly or operation thereof.

A further object of the invention is to provide a construction of distributor radio shield which may be readily and inexpensively formed by punching or stamping from sheet metal, although it is adapted for formation in other suitable ways.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawings which illustrate the invention—

Fig. 1 is a top plan view of apparatus embodying the invention;

Fig. 2 is a side elevation, partly broken away to show certain parts in section, of the apparatus of Fig. 1;

Fig. 3 is a side elevation, partly broken away, of the apparatus of Figs. 1 and 2, this elevation being viewed from a point 90° removed from the view point of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a side elevation, partly broken away, of the apparatus viewed from the right hand side of Fig. 3;

Fig. 6 is a side elevation, the same as Fig. 3, on an enlarged scale and broken away, showing the securing means for the semi-cylindrical parts of the shield, with the securing bolt omitted; and Fig. 7 is a section, on an enlarged scale, on the line 7—7 of Fig. 4.

Referring to the drawings, the apparatus comprises the usual distributor base 1 of metal within which turns the metal shaft 2 which operates the interrupter 3 and rotates the conductor arm 4 passing in proximity to the electrodes 5 in the cap 6 of insulating material such as Bakelite. Distributors of this construction are well known and require no further description here.

The radio shield for the distributor comprises a tubular, cylindrical body portion of sheet metal formed by the two semi-circular portions 7 and 8, the part 8 having the marginal beads 9 and 10 of substantially circular cross section. Similarly the body part 7 has the marginal beads 11 and 12 of substantially circular cross section. The semi-circular portions 7 and 8 are hinged together by the interengaging portions 13 and 14. These inter-engaging portions may be unhooked thereby rendering separable the parts 7 and 8 when they are turned on the hinge into open position. Conversely the parts 7 and 8 may be hinged to each other by hooking the hinge portions 13 and 14.

An upper closure for the cylindrical body portion is formed by a sheet metal dome comprising a top wall 15 having the marginal depending side wall 16. At its lower edge this closure has its side wall bent outwardly to form a substantially right-angled flange 17, while the outer edge of this flange is bent at substantially a right angle to form a lip 18.

In the side wall 16 of this closure are the openings or outlets 19 for the passage of the conductors connected with the distributor. Such out-

lets may each be provided with a metal nipple comprising the metal pipe 20 secured in the side wall 16, preferably in a fluid-tight manner, by any suitable means as by welding or soldering. At its outer end each pipe 20 is screw-threaded to receive a coupling 21 to which is secured a flexible radio shielding conduit 22 leading to the apparatus to which it is desired that the conductor 23 in the conduit shall be connected.

The closure at the other end of the tubular body portion comprises the metal, annular plate 24 having its outer edge turned to form the lip 25 at substantially right angles. At its inner edge the annular plate 25 has the downwardly bent lugs 26 at substantially right angles, the closure being secured to the base 1 of the distributor by screws 27. This closure might, of course, be secured to the part 1 by any suitable means or formed integrally therewith. The closure thus forms a supporting base for the entire distributor shield.

The inner edge of the annular plate 24 is cut away at 28 forming slots between the inner edge of the closure and the distributor part 1, through which the interior of the shield may be ventilated and any condensate or other moisture within the shield may be drained out. Such ventilation dilutes or removes the ozone or ionized gases formed about the distributor. The slot should be sufficiently narrow so as to accomplish the desired radio shielding and may vary under different circumstances and conditions. It has been found, however, that a slot twenty-eight hundredths of an inch wide has given satisfactory service.

The edges of the body parts 7 and 8, which are opposite the hinge, may be secured together by any suitable means whereby the dome forming the closure at one end and the closure at the other end of the tubular body portion will be securely clamped between the body parts 7 and 8.

This fastening at the side of the body portion opposite the hinge may comprise two angled plates 29 and 30 secured respectively to the body parts 7 and 8 by welding or in other suitable ways.

In the outwardly projecting legs of these plates, are registering holes in which is a fastening bolt or screw 31 which is rotatable in but not withdrawable from the hole in one of the outward plate legs and having a head 32 adapted for engagement by a turning tool as by providing the usual screw-driver slot.

Secured at its ends to the outer side of the outwardly extending leg of the plate 30, and having its intermediate portion spaced outwardly therefrom, is a suitably resilient wire 33. The end of the bolt or screw 31, opposite the head, has a diametric opening 34 adapted to receive the wire 33. From one end of the opening a slot 35 extends about the bolt and is inclined away from the end of the bolt, the inner end of the slot 35, however, being returned slightly towards the end of the bolt so as to prevent the wire 33 from being dislodged therefrom after it has been fully engaged by the bolt. From the other end of the opening 34 extends a slot 35' precisely similar to the slot 35 and which extends from the end of the opening about the bolt in the same direction as the slot 35. When, therefore, the body parts 7 and 8 are turned on their hinge to bring the plates 29 and 30 adjacent each other, the bolt 31 will be entered through the hole in the plate 30 and the opening 34 brought in line with the wire 33 which is entered therein.

Turning of the bolt or screw 31 in the appropriate direction will cause the wire to be cammed by the slot 35, and its corresponding slot 35' on the opposite side, into the position as shown in Fig. 4.

The plates 29 and 30 will thus be drawn resiliently together (as shown in Figs. 2 and 4) by simply causing a partial turn of the bolt or screw, and when this fastening has been accomplished the parts will be securely, although resiliently, held against accidental unfastening.

In assembling the shield, the body portion has the parts 7 and 8 hinged together and, the fastening at the opposite side from the hinge being loose, the parts are turned on their hinge to open them so as to receive within them the flanges on the dome or top closure and the base plate 24. The parts 7 and 8 are then turned on their hinge so as to cause these flanges to enter within the beads 9, 10, 11 and 12 and the edges of these parts 7 and 8, opposite the hinge, are brought into proximity and fastened by the fastening means as described. The closures at the two ends of the cylindrical body portion are thus securely clamped therein, pressure being resiliently maintained between the body portion and its end closures by the resiliency of the fastening, and also the lips 18 and 25 being wedged into the beads on the body portion, the resiliency of the contacting parts causes a resilient contact between them. Also the wedging of these lips into the beads, and the fact that there is edge contact, causes the parts to wipe upon each other thereby automatically cleaning the contacts as the device is assembled and any relative movement between them occasioned or permitted by the resilient pressure of these contacts during operation or at other times, cleans the contacts and insures good electrical connection between the parts of the shield which is an important feature in connection with the radio shielding operation. By reason of the resilient pressure between the parts, as referred to, they are always held in tight condition and good electrical connection.

It will be seen that the shield parts together with the metal distributor base 1 and shaft 2 form a substantially complete metal closure for the distributor contacts so that a good radio shield for the distributor is provided.

The grounding of the shielding, which is important may be effected by reason of the contact of the shield with the distributor base 1 which is usually in electrical connection with the engine block or it may be effected through the metal conduits 22 which are connected with the spark plug radio shield which is usually grounded on the engine block, or the shield may be grounded by both of these methods and in other ways.

Corrosion of the shield is to be avoided especially at contact surfaces. This may be relieved against by making the shield parts of metal having inherent corrosion resisting properties such as brass, aluminum or other such metal. If the shield parts are made of metal which is not inherently corrosion-resisting, it may be protected from corrosion by coating with a corrosion-resisting metal, such as copper or zinc, by electroplating or dipping it.

It will further be observed that the shield is readily dis-assembled or opened to permit free access to the distributor for inspection, repair or replacement. The shield body is readily detachable upon the loosening of a single fastener which is permanently secured to the shield so

that it cannot be separated therefrom, and releasing and locking of the fastener may be accomplished with the finger or with a screwdriver by a relatively small turning movement. Further the fastener must be either locked or free and is not susceptible of being partially loose or partially fastened and cannot be loosened by vibration. Also the angular position of the shield body with relation to the distributor or the closures at its ends, is not fixed and may be rotated into any convenient position without affecting the operation or position of the other parts. Also it is unnecessary to assemble the body portion with a particular end up as it may be used with either end up, the ends being alike. Altogether the dis-assembly of the shield by removing the body portion, and also the reassembling as described, may be very easily and simply accomplished. In fact the simplicity of the device makes it entirely possible that this operation may be accomplished in darkness by "feel."

While the invention has been illustrated in what is considered its best application it may have other embodiments without departing from its spirit and is not, therefore, limited to the structures shown in the drawings.

What we claim is:

1. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal tubular body portion surrounding the distributor and metal end closures for said portion, said shield having outlets for the conductors from said distributor, said body portion being secured to each of said end closures by a co-operating groove and part entering the same located on adjacent parts of the closure and body portion.

2. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal tubular body portion surrounding the distributor and metal end closures for said portion, said shield having outlets for the conductors from said distributor, said body portion being secured to each of said closures by a bead on said body portion with which engages a part on the closure portion.

3. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a tubular body portion surrounding the distributor and closures at the ends of said body portion, one of said closures comprising a top and a depending marginal side wall having conductor outlets, said body portion being formed of a plurality of semi-circular parts hinged together and having a bead at each end, the last mentioned end closure having an out-turned flange with a lip thereon and entering a bead at one end of said body portion, the closure at the other end of said portion having a lip at its edge and entering within the other bead in said body portion, and a fastening securing said body portion in assembly with said closures.

4. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal, tubular body portion severed longitudinally at one side whereby the severed edges

may be separated to permit the tubular body to receive the end closures, end closures surrounded by said tubular body and means for drawing said edges together to clamp said body and closures together, said radio shield having conductor outlets, each of said closures and said body having a groove in one receiving a part of the other.

5. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal, tubular body portion severed longitudinally at one side whereby the severed edges may be separated to permit the tubular body to receive the end closures, end closures surrounded by said tubular body and means for drawing said edges together to clamp said body and closures together, said radio shield having conductor outlets, said body having a groove adjacent each end, each of said grooves receiving a part of one of said closures.

6. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal, tubular body portion severed longitudinally at one side whereby the severed edges may be separated to permit the tubular body to receive the end closures, end closures surrounded by said tubular body and means for drawing said edges together to clamp said body and closures together, each of said closures and said body having a groove in one receiving a part of the other, one of said closures having a top and depending marginal side wall with conductor outlets.

7. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal, tubular body portion severed longitudinally at one side whereby the severed edges may be separated to permit the tubular body to receive the end closures, end closures surrounded by said tubular body and means for drawing said edges together to clamp said body and closures together, said body having a groove adjacent each end, each of said grooves receiving a part of one of said closures, one of said closures having a top and depending marginal side wall with conductor outlets.

8. The combination with a distributor for the ignition of an internal combustion engine, of a radio shield for said distributor comprising a metal, tubular body portion severed longitudinally at one side whereby the severed edges may be separated to permit the tubular body to receive the end closures, end closures surrounded by said tubular body and means for drawing said edges together to clamp said body and closures together, said body having a groove adjacent each end, each of said grooves receiving a part of one of said closures, one of said closures having a top and depending marginal side wall with conductor outlets, and the other of said closures having a central opening for a support, the last-mentioned closure having a recess in the edge of its central opening to provide ventilation.

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JEAN W. HAMILTON.