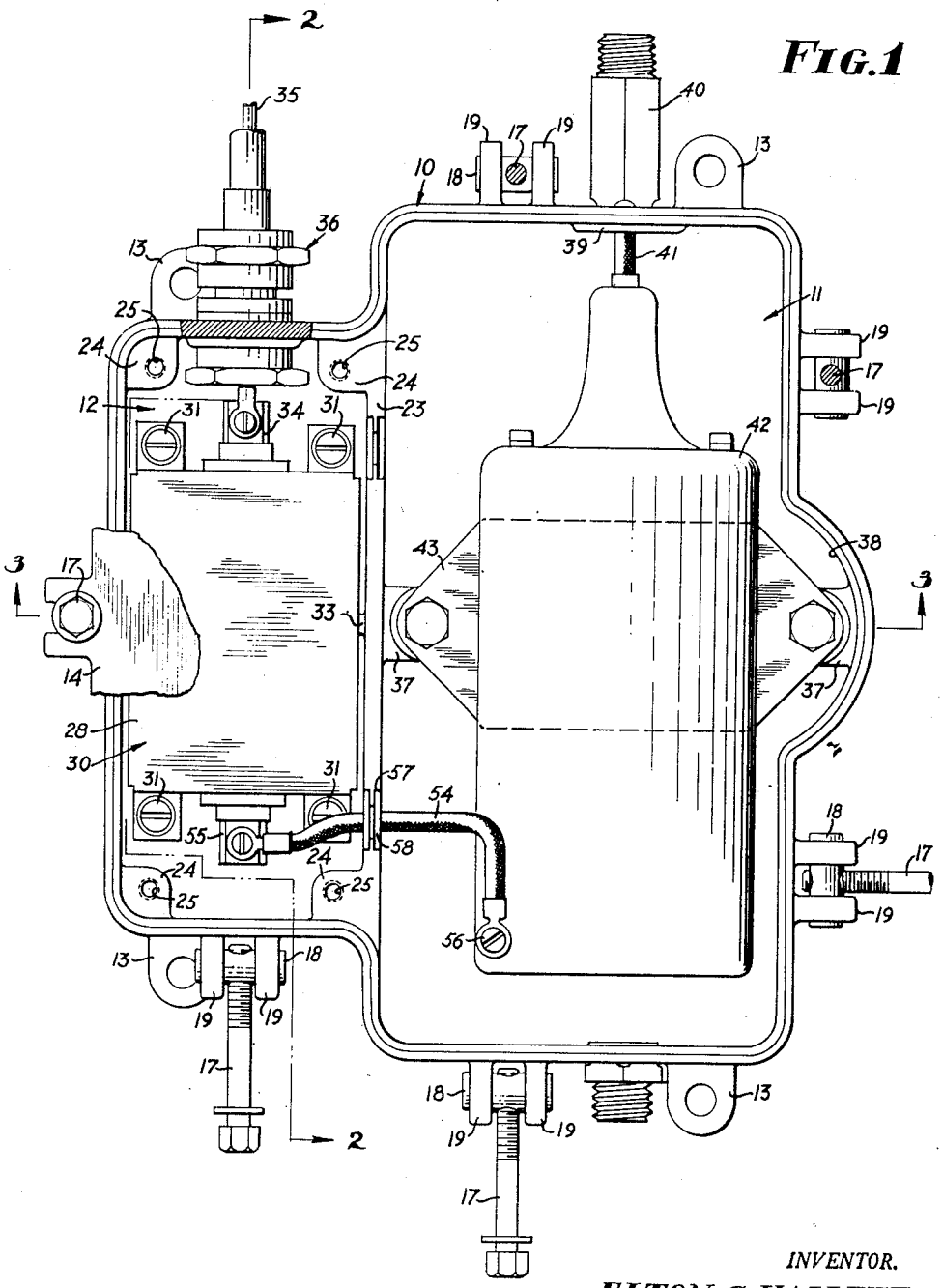
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SHIELDED HOUSING FOR IGNITION COILS AND FILTERS

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FIG. 1



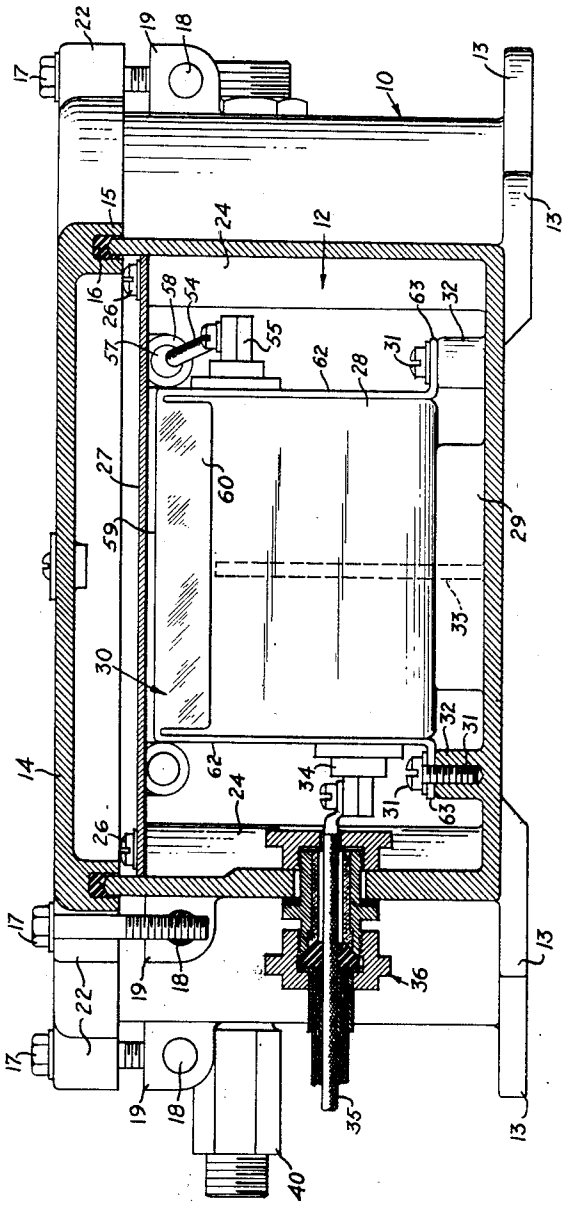
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FIG 2



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FIG. 3

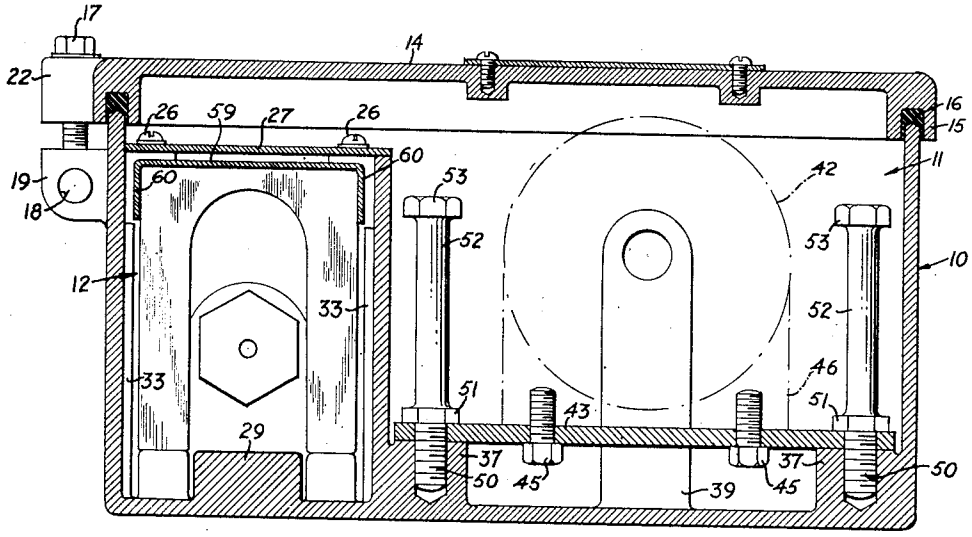
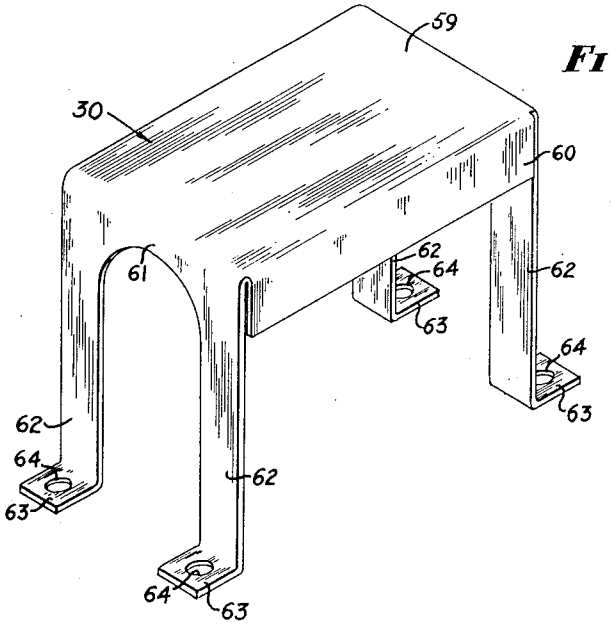


FIG. 4



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SHIELDED HOUSING FOR IGNITION COILS AND FILTERS

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Application September 17, 1945, Serial No. 616,874

4 Claims. (Cl. 123—148)

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The invention relates to the shielding and protection of electric systems of internal combustion engines in order that they may be properly protected from moisture and at the same time prevent electric pulsations from radiating outwardly therefrom. The invention has particular reference to the provision of unitary mountings for electric units so that the units may be quickly and efficiently installed and removed from the housing.

The electric ignition system of an internal combustion engine when in operation produces a variety of electric radiations of a character having a tendency to interfere with reception in a radio apparatus carried by the vehicle. The effect of such disturbances is often exaggerated when radiations existent in one electric unit are picked up in another and then discharged. At the same time, for the sake of economy in design, the shielding element, which may be a metallic housing, must be made compact and must provide sufficient space around electric units housed therein that connections to the units may be made and so that mountings for the units may be disengaged from the interior of the housing without the use of special tools.

It is therefore among the objects of my invention to provide a new and improved electric filter and ignition coil shield device which will substantially prevent the transmission of electric radiations from one electric unit to another and which likewise shields them from the outward transmission of radiations.

Another object of my invention is to provide a new and improved housing for an ignition coil and electric filter which incorporates a simplified mounting for the coil, permitting it to be installed and removed as a unit without the use of special tools.

Still another object of my invention is to provide a new and improved combined ignition coil and electric filter housing in which the coil and filter are separated one from another in compartments wherein one compartment, in effect, lies partitionally within the other and wherein both compartments are covered and protected by the same lid.

Still another object of my invention is to provide a filter bracket of special design which can be quickly and inexpensively constructed in a manner serving several needs thereby incorporating an auxiliary metal shield for blocking electric radiations and a mechanical means for attaching a filter unit to the housing.

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With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of the combined ignition coil and filter housing showing the electric units in place.

Figure 2 is a longitudinal sectional view on the line 2—2 of Figure 1.

Figure 3 is a cross-sectional view on the line 3—3 of Figure 1 with the electric units removed.

Figure 4 is perspective view of a filter bracket used in the housing.

In providing electric shielding for ignition devices and waterproofing for the same devices the prior art, and particularly the prior combustion engine art, does not evidence appreciation of the fact that a shield or protecting unit serving these two distinct purposes might be combined into one, thereby eliminating and simplifying both the original installation and the servicing. Where motor vehicles perform heavy duty in the field, making it necessary in servicing to remove the electric units from time to time, it is essential that the housing be so designed that ready and efficient removal can be accomplished without the use of specially designed tools.

In the drawings there is shown a housing in the form of a water-tight box indicated generally by the reference character 10 consisting of two substantially parallel compartments 11 and 12 of different length but in effect constituting parts of the same housing. As shown in the drawings the housing includes extensions 13 having apertures for the reception of machine screws or bolts by means of which the housing may be secured to a combustion engine. The compartments 11 and 12 adjoin and a lid 14 is positioned so as to overlie both of them. Around the perimeter of the lid and engaging the edges of walls of both of the compartments is a double flange 15 enclosing a resilient gasket 16 which is designed to be drawn against the top edges of the walls of the housing and the flanges are arranged to be pulled downwardly into place surrounding the edges of the walls and there secured by means of screws 17.

From an inspection of the drawings it will be apparent that a pivot 18 is rotatably mounted in opposite legs 19 of each of a series of lugs near the top of the housing wall. The screws 17 extend into the pivots 18 in a lateral direc-

tion and may be rotated upwardly so that the screw may be inserted between legs of lugs 22 which extend laterally from the sides of the lid. In this position the head of the screw and an accompanying washer may be drawn downwardly against the lug in each case to hold the lid in place.

In the interior of the box there is provided a partition wall 23 which separates the smaller of the two parallel compartments from the larger compartment 11. Compartment 12 is thus separated from compartment 11 by means of partition 23, of the same material as the box and comprising one complete side of the smaller compartment, although forming only a part of one side of the larger compartment. It will be noted that the partition 23 does not extend quite as high as the top of the walls of compartment 11. Within compartment 12 is a set of corner bosses 24 having threaded apertures 25 therein adapted to receive screws 26 for attaching a cover 27 to the top of the compartment. The embodiment 12 is by this means isolated from the compartment 11 to the extent of damping the transmission of electric radiations.

The compartment 12 is designed to receive an electric filter 28 which is secured in place upon an elongated boss 29 by means of a bracket 30, shown in detail in Figure 4. The bracket is held in place by means of machine screws 31 extending into bosses or projections 32, the tops of which are about the same elevation from the floor of the compartment as the top of the boss 29. A fin 33 tends to partially separate one end of the compartment 12 from the other.

At one end the filter is provided with a terminal 34 which by means of a wire lead 35 extends through a waterproof connection 36 in the wall of the housing, from the interior to the exterior. The connection is one of special construction made water tight so that no moisture can seep into the housing along the surface of the lead.

In the large compartment 11 there are provided bosses or projections 37 which extend upwardly from the bottom along the side walls. The projections are preferably integral with both the bottom and the side walls and it will be noted that they are rounded at the corners and are located intermediate the ends of the compartment. In the case of the boss at the right, as viewed in Figure 1, there is provided a bay 38 in the wall of the housing adapted to accommodate the boss. An additional thickness is provided at 39 in one end wall for increasing the rigidity of the housing and to provide sufficient metal for a threaded hole to receive a connection 40. A high tension outlet lead 41 from the coil extends in substantially an axial direction from the center of the coil to the center of the connection.

As indicated, an ignition coil 42 is designed to be retained in compartment 11 with ample space provided on all sides. A bridge 43 is designed to retain and support the ignition coil, spaced as required from the walls and floor of the compartment.

It will be further noted that screws 45 in the bridge extend upwardly through a mounting 46 beneath the ignition coil intermediate the ends.

For holding the bridge in place there are provided bolts 52 of special design. The lower ends 50 are threaded as far as a hexagonal shoulder portion 51 which can be drawn tight against the bridge. A smooth shank extends outwardly to a square or hexagonal head 53 adapted to provide a wrench hold.

When the ignition coil is to be mounted it is first attached to the bridge 43 by means of screws 45 and then the bridge together with the ignition coil is lowered into place so that the bridge overlies projections 37. Next the bolts are applied by screwing the threaded ends in each case downwardly into the projections 37 until the shoulders 51 bear tightly against the bridge. A connection or lead 54 is applied to upper terminal 55 of the filter and to a corresponding upper terminal 56 of the coil. The lead extends through an aperture 57 in the partition in which may be incorporated a lining 58.

A special type of bracket has been shown for anchoring the coil. This bracket consists of a single sheet metal member having a flat top 59 and having parallel wings 60 at the sides and end elements 61 bent at right angles to the top, and, throughout a portion of their length lying in edge to edge relationship with the ends of the wings 60. The end elements terminate in legs 62 which lie in the same plane as element 61. At the end of each leg there is an outwardly turned foot 63 having bolt holes 64.

The brackets thus described are designed to fit snugly around the case of a filter so that the top, wings and end elements snugly encompass the upper portion of the case, as suggested in Figure 2. The casing is supported on boss 29, as previously noted, and the feet secured upon bosses 32 by the screws 31. Since all of the parts are metallic the connection is electrically continuous from the filter case through to the bottom of the housing. The same general arrangement likewise applies to the casing of the ignition coil which is electrically grounded through the bridge to the bottom of the housing.

When electric units are to be installed in a housing of this kind they are incorporated as units. The filter case is placed within the bracket where it may be retained by a slight pressure of the wings and ends against the casing. The filter case together with the bracket may then be applied to the bosses within the compartment 12 and secured in place.

The coil casing is initially attached to the bridge 43 and then the bridge together with the coil is lowered into place and the threaded ends 50 screwed into place by application of a wrench to the heads 53. After the electrical connections are made the cover 27 is attached in place and following this the lid 14 is applied over both compartments and drawn down tightly so that the edge makes a water tight connection with the tops of the walls of the compartments.

By the simple expedient defined herein there has been provided an electric and moisture resistant shield for different types of electric units of the ignition system of a combustion engine which is easily serviced and which is effective under a wide variety of unusual conditions wherein it is useful not only to shield units within the housing from contact with water and moisture but also to shield adjacent radio circuits from electric radiations which might be set up in units within the housing.

Although I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described my invention, what I claim is new and desire to secure by Letters Patent is:

1. A combination electric and moisture resistant shield for electric units of the ignition system of a combustion engine comprising a two compartment housing wherein said compartments are elongated, parallel and of unequal length and have the bottoms thereof continuous and on the same plane, a longitudinal partition between the compartments of electrically conducting material extending the full height of the shorter of said compartments, corner bosses in said last compartment and a cover of electrically conducting material secured to the tops of the corner bosses and said partition, a mounting unit for a filter in said last compartment comprising a single element adapted to surround the filter in spaced relation to the walls and cover of the compartment and to engage projections on the bottom thereof, a mounting unit for the coil comprising a laterally extending coil supporting bridge secured to the coil intermediate the ends and bolt posts securing the bridge to internally rounded projections in the bottom of the longer compartment laterally disposed relative to the coil, endwise, substantially axial connections from the units extending throughout the compartment wall in waterproof relation thereto, a connection through the partition from the filter to the coil, and a lid overlying both compartments sealed at the edges thereof with a waterproof seal.

2. A combination electric and moisture resistant shield for electric units of a combustion engine ignition system comprising a housing of electrically conducting material forming a coil compartment, projections extending upwardly from the bottom at the junction of the bottom and side walls and rounded at the inner faces thereof, said projections being integral with said bottom and side walls and intermediate the ends of the compartment, a relatively narrow bridge spanning the bosses in spaced relation to the bottom having bolt holes at the ends and coincident tapped apertures in the bosses, bolts comprising a threaded end extending through the holes into the threaded apertures, a shoulder adjacent the threaded end bearing on the bridge, a relatively long smooth shank on the side of the shoulder remote from the threaded end and a wrench-engaging head on the shank adjacent to the top of the compartment walls, a coil secured to the bridge as a unit intermediate the ends of said bridge, watertight connections from said coil through the housing walls and a water tight lid of electrically conducting material for said compartment.

3. An electric shielded and moisture resistant housing for metal encased electric units of a combustion engine ignition system a combined retainer and inner electric auxiliary shield comprising a single sheet material member having a flat top adapted to be pressed against a casing for one of said units and in electrically continuous contact therewith, parallel wings on opposite side edges bent at right angles to the top, ends comprising parallel cut-out elements bent at right angles to the top and having an edge to edge position relative to adjacent ends of the wings, each said end terminating in parallel legs extending beyond the wings and in the plane of said end, and outwardly turned feet at the extremities of the legs at right angles to the plane of the legs apertured for reception of fasteners for securing the legs to the housing and fins on the interior of the housing extending into positions adjacent portions of the units uncovered by said shield and jointly with the shield comprising a dividing partition between the end of the unit.

4. An electric shielded moisture resistant housing for electric units of a combustion engine ignition system comprising a relatively deep box, a lid therefor having a moisture-tight contact with the rim of the box, projections on the bottom of the box extending inwardly therefrom, a boss intermediate said projections and laterally inwardly extending fins on the side walls adjacent the boss, an electric unit smaller in transverse area than the area included within said projections and adapted to be supported on the boss in a position wherein cooperation between the fins and the unit divide the box interior into substantially separate compartments, and a retainer for the unit comprising a sheet material member having a flat portion adapted to contact said unit in electrically continuous contact therewith, wings overlying opposite sides of the unit at an angle to the flat portion, ends overlying opposite ends of the unit at an angle to said flat portion and angularly disposed relative to the wings, each said end terminating in a pair of legs extending beyond the wings to a location substantially parallel to the bottom of said unit, and feet at the extremities of the legs at an angle to the plane of the legs and substantially parallel to the bottom of said unit, said legs being adapted to be anchored to the tops of said projections when said unit is resting upon said boss.

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