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E. C. HALLETT

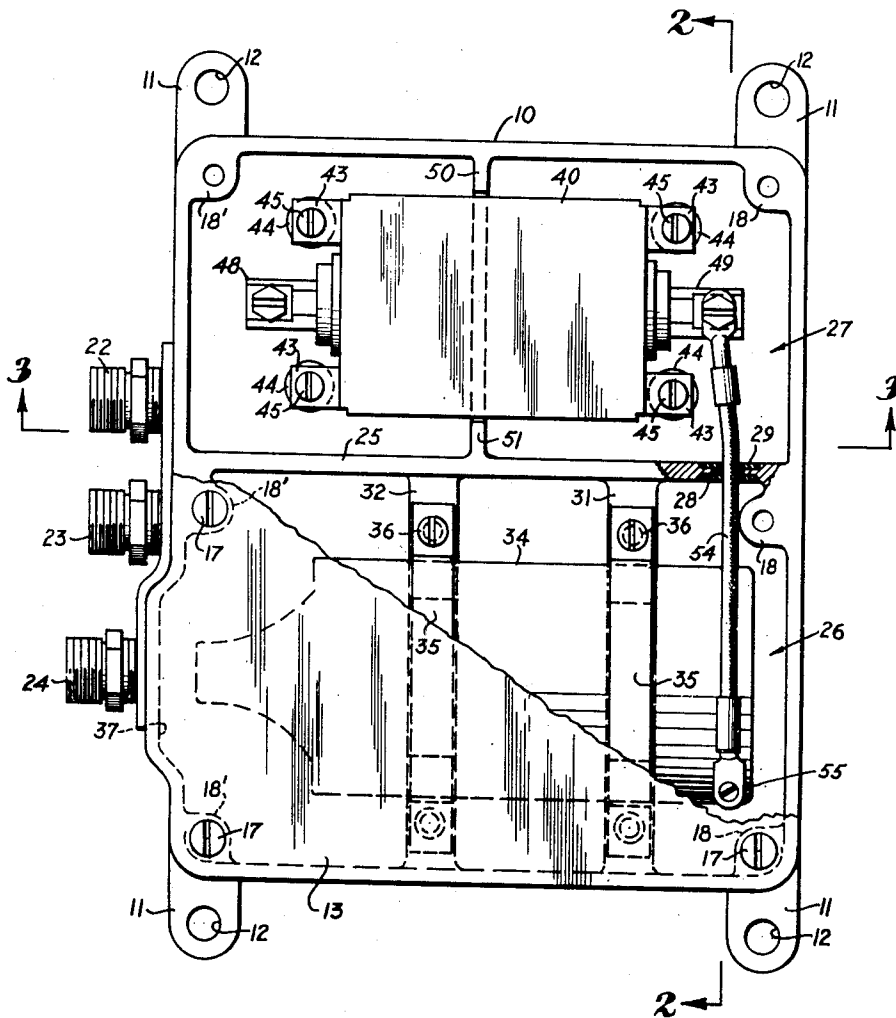
2,462,491

IGNITION COIL AND FILTER SHIELD ASSEMBLY

Filed Oct. 22, 1945

2 Sheets-Sheet 1

FIG. 1



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2 Sheets-Sheet 2

FIG. 2

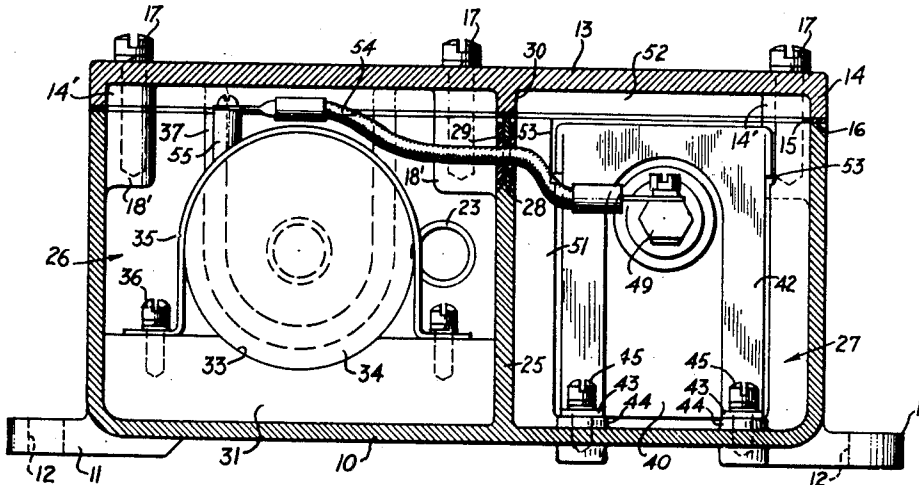
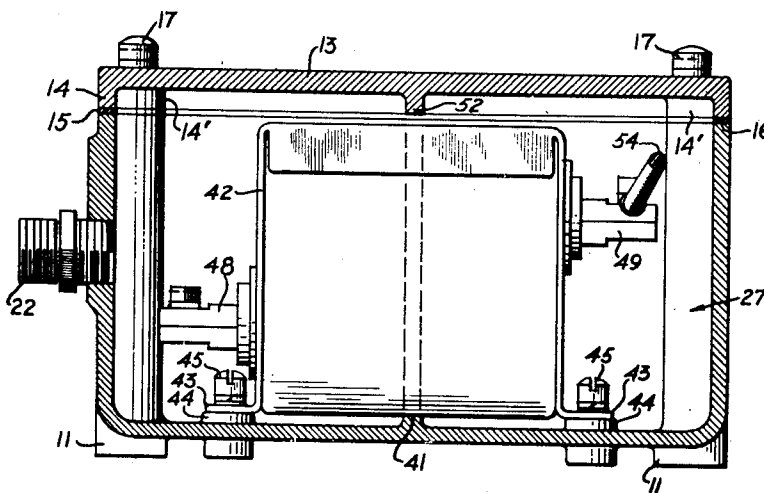


FIG. 3



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IGNITION COIL AND FILTER SHIELD
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4 Claims. (Cl. 123—148)

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My invention relates to the shielding and protection of electric units comprising portions of the ignition system of combustion engines and has particular reference to a metallic housing which completely encloses certain of the units, as for example, an ignition coil and electric filter, so that the units are protected against moisture and other outside influences while being at the same time shielded so that any high frequency electric radiations generated in them will be prevented from passing outwardly in such a way as to interfere with reception in a radio receiving set which may be mounted in the immediate vicinity.

Under particular circumstances radio equipped vehicles may be used in such a way that there is danger of water, moisture, dust and the like collecting around the engine parts sufficiently to damage the parts and particularly units of the ignition system. In order to assure continued operation of the engine the ignition units which might be thus damaged must be protected. Moreover, in order to maintain a compactness in the design of the engine as a whole, it is found advantageous to incorporate electric shielding for the same ignition system units in some manner with the weather protecting features.

It is therefore among the objects of my invention to provide a new and improved housing for combustion engine ignition units which is compact in design and which performs a double function of shielding the unit from possible damage due to water, moisture, dust and the like and shielding or isolating the units with respect to electric radiations so that operation of the units will not interfere with operation of a radio set carried by the vehicle.

Another object of my invention is to so construct a shielding housing in a special manner so that compartments within the housing are shielded from each other electrically in order that radiations set up in the units of one compartment do not magnify radiations present in one of the other units.

Still another object is to subdivide individual compartments in a housing so that radiations emanating from a connection at one end of an electric unit are shielded from the other end of the same unit.

A further object of my invention is to construct a shielding housing in a new and improved manner so that supports within the housing for electric units are compactly, economically and efficiently designed in order that the units may be properly spaced within suitable compartments,

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securely anchored in place, and at the same time properly grounded for electric shielding purposes.

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

Fig. 1 is a top view of the device with the lid partially broken away to reveal the interior.

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

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 1.

Methods have been known in the radio art whereby metal shielding is utilized on electric conductors in and around radio circuits in order to prevent the radio circuits from picking up interfering high frequency electric radiations and it may well be that shielding of this sort has been used on portions of the ignition system of combustion engines. Where engines are designed to permit their use under conditions where they may be regularly operated in the presence of water, moisture, dust and dirt more careful attention must be given to the protection of electric units against the action of weather. To date however, there has not been devised a satisfactory compact protection for such electric units which insures their continued and successful performance under all conditions and which likewise shields them sufficiently so that whenever a vehicle operated by the engine carries radio equipment there will be no interference with radio transmission whether the vehicle is at rest, running at idling speed, or being operated over a rugged countryside.

In an embodiment of my invention chosen for the purpose of illustration I have shown a housing comprising what may be designated as a box 10 of metallic material or other strong and rigid material having the capacity of conducting electricity on which are provided extensions 11 provided with apertures 12 by means of which the box may be bolted or otherwise fastened to some portion of a combustion engine. The box as illustrated has relatively high walls so that the compartments therein are deep and is provided with a lid 13 having a flange 14 around its perimeter faced with a gasket 15 which is adapted to be pressed into sealing relationship with the top edges 16 of the box walls. Machine screws 17 pass through bosses 14 at the corners of the lid, through corner bulges in the gasket and thence

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into threaded engagement with corner bosses 18, 18', etc., of the box so that the lid may be pulled down tightly against the top edges of the box in order to make the interior of the box waterproof, moisture proof and dust proof. The corner bulges of the gasket prevent any leak around the screws. On the walls of the box are provided fittings 22, 23 and 24 to which tubing may be secured in order that electric leads may enter the housing through a waterproof conduit.

Within the box there is provided an interior partition wall 25 which is integral with the bottom and side walls. The partition separates the interior into two parts comprising a larger compartment 26 and a smaller compartment 27. In the partition is an aperture 28 having an insulated lining 29 forming a passage between the compartments. On the lid is an interior rib 30 which coincides with the top edge of the partition when the lid is in closed position making a continuous separating wall between the two compartments. By this device one compartment is electrically shielded from the other.

Within the compartment 26 there are provided saddles 31 and 32 disposed parallel to each other and spaced from the end walls of the compartment. It will be noted that the saddles are relatively narrow and are integral with the bottom and side walls of the compartment. Each of the saddles has a recessed central portion 33 adapted to receive an ignition coil 34. The coil is bound to the saddle in each case by means of a strap 35 preferably metallic which is anchored to the top edge of the saddle on each side of the recessed central portion by means of screws 36. Mounted in this manner the ignition coil is spaced from the bottom, side walls, end walls and lid of the compartment. By the arrangement shown the coil is securely anchored in its proper position so that the spacing at one end may be proper in view of the configuration of one end of the coil. A bay 37 is provided in one end wall so that the central portion of the bay is spaced from the extreme end of the coil 34.

In the compartment 27 is an electric filter coil 40 which is designed to rest upon a laterally extending flat topped boss 41. The filter coil is held in place by means of a specially designed bracket 42 which encompasses the top, sides and ends of the filter and has feet 43 anchored to bosses 44 at the bottom by means of screws 45.

Compartment 27 is subdivided so that one terminal 48 which may be a hot wire terminal is shielded electrically from another terminal 49 at the opposite end which may be a cold wire terminal. The shielding is accomplished by a pair of vertical ribs 50 and 51 at the sides of the filter which extend upwardly from the ends of the boss 41 and a rib 52 extending from the top of one vertical rib to the top of the other but which is formed on the inside of the lid. It will be noted that although the ribs need not actually touch the outside of the filter, they are nevertheless of such a height that there is only a small space between the edge of the rib in each case and the adjacent surface of either the filter or the bracket which surrounds the filter. In keeping with the desirability of bringing the ribs close to the surface of the filter the vertical ribs are shown cut out as at 53 so that the lower portion hugs the surface of the filter and the upper portion hugs a portion of the bracket which overlies the side of the filter. A connection 54 electrically connects the terminal 49 of the filter with a terminal 55 of the ignition coil. The connection passes

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through the lining 29 of the aperture 28 leaving little or no space in order to preserve as nearly as possible a complete electric shield between the two compartments. Both electric units, being provided with casings of electrically conducting materials, are grounded with their respective mountings to the box and hence to the combustion engine.

By the arrangement shown there has been provided a compact housing for electric ignition units which completely encompasses the units individually with a weather-proof electric shielding protection so designed and applied that not only is each unit isolated from the other and from the exterior but also so that terminals of different potential on opposite ends of the same unit are shielded from each other.

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

1. An internally shielded housing for electric units comprising: a box of electrically conducting material having a compartment for the reception of one said unit, a lid therefor sealed at the edges and including an electrically continuous mechanical connection from the lid to the body, means for supporting the unit in spaced relation to the surrounding walls of the compartment and ribs extending from the walls inwardly to positions adjacent the unit, said ribs lying in a laterally intersecting plane intermediate the ends of the unit whereby the compartment is divided into subcompartments electrically shielded one from another.

2. In an internally shielded housing for electric units of a combustion engine ignition system the combination of a plurality of electric unit casings, a box of electrically conducting material having a compartment for the reception of one said casing, a lid for the box sealed at the edges and including an electrically continuous mechanical connection from the lid to the box, a bracket partially surrounding the casing and anchored to the box for supporting the casing in spaced relation to the surrounding walls of the compartment and ribs extending from the walls inwardly to positions adjacent the casing and the bracket, said ribs lying intermediate the ends of the casing, certain of said ribs being cut out to fit around said bracket, said bracket and casing jointly with said ribs comprising a partition dividing the compartment into subcompartments electrically shielded one from another.

3. In an internally shielded housing for electric units of a combustion engine ignition system the combination of an ignition coil casing, a filter casing and a box having an internal partition dividing the interior into a compartment for reception of said ignition coil casing and a compartment for reception of said filter coil casing adapted for inclusion of a filter having hot and cold wire terminals at the respective ends thereof, and a lid for the box, one said compartment having a boss of electrically conducting material on the bottom intermediate the ends extending from side wall to side wall for supporting the filter, vertical ribs of electrically conducting material on the side walls in the same plane as the boss extending inwardly to the filter, and a transverse rib forming part of the lid spanning the distance between the tops of the vertical ribs and extending inwardly to the filter, said ribs jointly with the filter comprising a partition in the smaller compartment between two sub-compartments, one adjacent each terminal, substantially shielded electrically from each other and from the larger compartment.

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4. An internally shielded housing for an electric unit comprising a box of electrically conducting material forming a compartment, an electric unit in the compartment having oppositely disposed hot and cold wire terminals, and ribs extending transversely inwardly in the same plane from the walls of the compartment to the unit forming spacers between said unit and the compartment walls and said ribs jointly with the unit comprising a partition separating said compartment into subcompartments housing the respective hot and cold wire terminals.

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