

Feb. 22, 1949.

E. C. HALLETT

2,462,489

MULTIPLE SHIELDED ASSEMBLY UNIT

Filed Sept. 17, 1945

Fig. 1

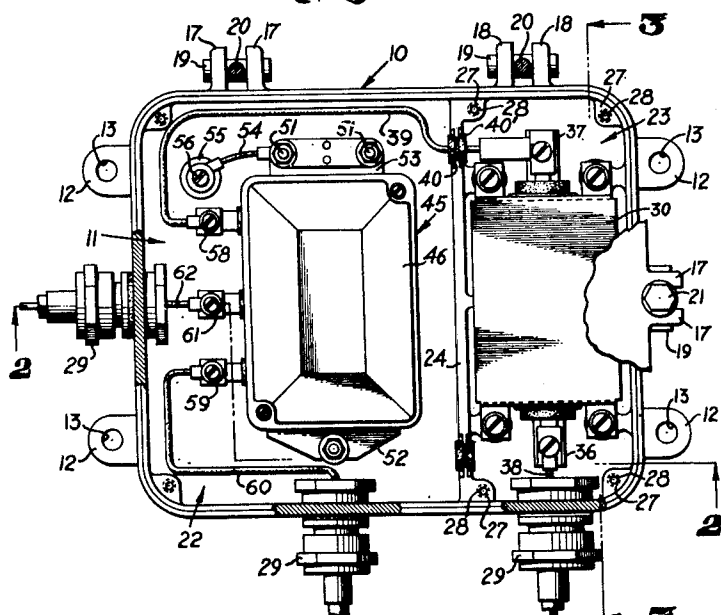


Fig. 4

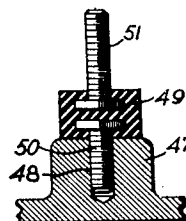


Fig. 2

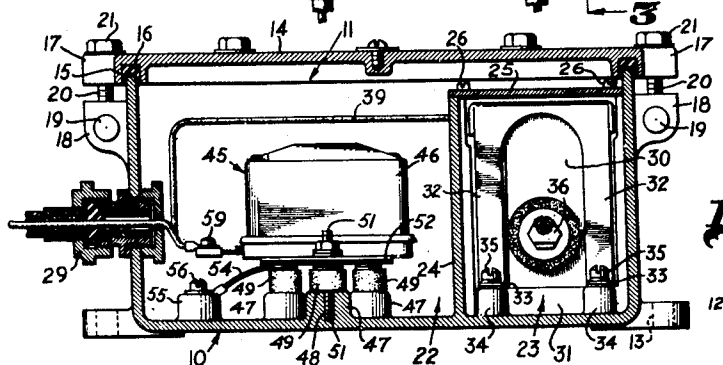
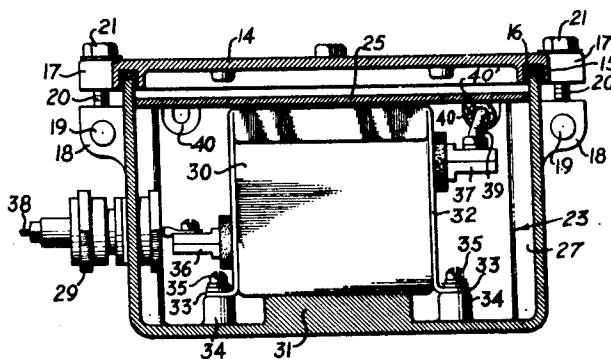


Fig. 3



INVENTOR.
ELTON C. HALLETT.

BY

Robert Ashburner

ATTORNEY.

UNITED STATES PATENT OFFICE

2,462,489

MULTIPLE SHIELDED ASSEMBLY UNIT

Elton C. Hallett, Inglewood, Calif., assignor to
Hallett Manufacturing Company, Inglewood,
Calif., a corporation of California

Application September 17, 1945, Serial No. 616,873

3 Claims. (Cl. 123-148)

1

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 device capable of shielding the units against transmission of electric radiations outwardly and for preventing both moisture and mechanical vibrations from reaching the unit.

The electric ignition system of an internal combustion engine has a tendency when in operation to produce electric radiations which interfere with efficient operation of a radio receiving apparatus carried by a vehicle in which the combustion engine may be installed. Radio reception by means of portable radios carried by automotive vehicles has been highly essential in war time and effective radio reception must continue whether the vehicle is stopped or whether it is being operated over the country side. Military tactics frequently demand that such vehicles be driven through mud, water, dust and under all sorts of circumstances where electric units of the ignition system in company with other parts of the vehicle are subjected to much abuse. When proper operation of the ignition units is interfered with it augments to a greater extent than usual harmful interference with radio reception. When such vehicles are driven for long periods of time and without proper servicing some electric units and in particular units of the character of voltage regulators are furthermore apt to be damaged because of excessive vibration.

It is therefore among the objects of my invention to provide a new and improved multiple purpose housing for electric devices comprising portions of the ignition system of a combustion engine which is designed to accommodate the making of all connections, including a ground, inside the housing and wherein the interior of the housing is so constructed that individual electric devices housed therein are shielded electrically one from another and from the exterior.

Another object of the invention is to provide a new and improved insulated mounting for electric devices comprising various units of the ignition system of a combustion engine wherein the electric devices are shielded from water, moisture and vibration and are at the same time prevented from passing electric radiations outwardly in a manner which would interfere with reception of radio communication in a vehicle driven by the engine.

Still another object of the invention is to provide a combined insulating and shock-proof

2

mounting for electric units comprising portions of a combustion engine ignition system which features a water-tight housing surrounding the electric units, a shield for inhibiting the transmission of electric radiations and which incorporates a resilient moulding so that vibrations which may be imparted to the surrounding housing are prevented from being transferred to an electric unit contained therein.

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 top view of a housing incorporating the invention.

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

Figure 3 is a cross sectional view taken on the line 3-3 of Figure 1.

Figure 4 is a fragmentary enlarged sectional view of one of the shock-proof mountings.

Methods have been known in the radio art whereby metal shielding is utilized in conductors and around radio circuits in order to prevent the circuits from picking up interfering electric radiations. On the other hand a wide variety of waterproof coverings have been provided for electric units and conductors where they are to be used on combustion engines subjected to adverse conditions. To date, however, little attention has been given to the production of housings which constitute effective shields for such units capable of keeping water away from the units and likewise capable of preventing electric radiations emanating from the units from interfering with any radio apparatus which might be in the vicinity. It is furthermore advisable in many instances to isolate certain types of electric units to prevent mechanical vibrations from reaching them. Although the demand for housing of such character during war time has been great there is an ever increasing demand for similar equipment for many peace time uses. Need for such equipment arises where combustion engines are used on a wide variety of vehicles which includes aircraft and marine craft as well as automotive vehicles of one kind or another.

In an embodiment chosen to illustrate my invention there is provided a housing comprising a box body 10 having relatively high side walls and end walls forming an interior chamber 11. The box body is equipped with ears or extensions

12 having bolt holes 13 therein by means of which the box may be secured to some portion of a combustion engine or the frame of a vehicle in which a combustion engine is installed. In this way the box, which is of electrically conducting material, is grounded to the engine.

For covering the box there is provided a lid 14 having a flanged perimeter 15 in which is incorporated a resilient sealing element 16 which acts as a gasket when the lid is in place upon the box in order to make the joint waterproof.

Since the gasket material is usually a non-conductor of electricity a metallic connection is provided between the lid and the box comprising a set of forked lugs 17 on the lid and a set of corresponding forked lugs 18 on the body near the tops of the side walls. A horizontal pivot 19 extends between the portions of each of the lugs 18 and has a laterally extending threaded hole adapted to receive the shank 20 of a machine screw 21. By this means a metallic connection is established between the lid and the box which at the same time provides a device for pressing the sealing elements 16 tightly against the top edges of the side walls in order to make the necessary waterproof joint.

The internal chamber of the box is divided into a large compartment 22 and a small compartment 23 by means of a metallic partition 24 which extends from the bottom of the chamber to a line slightly below the top edges of the side walls. The small compartment is designed to be closed by means of a cover 25 of electrically conducting material which rests upon the top of the partition and against the adjacent side walls of the box where it is held in place by machine screws 26 extending through the cover into tapped holes 27 in corner bosses 28 in the small compartment.

Water-tight connections 29 are provided on different sides of the box by means of which electric wires may be passed from the outside to the inside of the box without permitting water or moisture to enter.

The small compartment 23 is designed to receive a filter 30 having a metallic casing which may be supported upon a boss 31 with which it makes an electric contact. The filter may be anchored by means of a bracket 32 having feet 33 attached to supporting bosses 34 by means of machine screws 35. The filter has terminals 36, 37 located within the small compartment and spaced from the walls. An electric lead 38 extends from the terminal 36 through an adjacent connection 29 to the exterior of the box and an electric lead 39 extends from the terminal 37 through an open recess or notch 40 in the partition 24, and thence into the compartment 22. The notches 40 may be provided with a cushioning or insulating saddle 40' if desired.

The compartment 22 is designed to house an electric unit such as a voltage regulator 45 surrounded by a metallic casing 46. For supporting the casing there are provided bosses 47 extending upwardly from the bottom of the box and having tapped holes 48 therein. The bosses 47 are three in number in the embodiment shown.

On the top of each boss is a shock mount 49 comprising a shock absorbing material of some acceptable variety, such for example as cork or rubber, which is adapted to absorb vibration. The shock mount, as illustrated in detail in view 4, is provided with a pair of screws 50 and 51; the heads of which are embedded in the shock

mount as indicated. The heads of the screws are separated one from another by the material comprising the shock mount. Screw 50 is threadedly received into the tapped hole 48 of the boss 47 and screw 51 is designed to engage the adjacent flat 52 or 53, as the case may be, which extends from one end or the other of the metallic casing of the voltage regulator. By this means therefore the casing is isolated from the box so that any vibrations which may be passed to the box from the combustion engine are prevented from reaching the voltage regulator.

In as much as most materials from which shock mount might be constructed are electric non-conductors the casing of the regulator must be appropriately grounded. There is accordingly provided a ground connection 54 which may be secured to one of the screws 51 and thus electrically connected to the casing. At its other end the ground connection is attached to a boss 55 on the bottom of the box by means of a screw 56 and the casing is in this way grounded to the boss where the shock mounts interpose insulation between the case and the box.

The lead 39 is shown extending from a binding post 58 on the regulator through the notch 40 in the partition wall to the terminal 37 of the filter. It may be noted that the lead and its connections are entirely within the box 10. From a second binding post 59 a lead 60 extends outwardly through one of the waterproof connections 29 to the exterior of the box. Still a third binding post 61 has a lead 62 extending therefrom through still another waterproof connection 29. By careful design of the box, space around the electric units needed to effect proper shielding and mounting is utilized to accommodate all electric terminals and binding posts so that they, too, are convenient to use and shielded from the exterior.

The multiple purpose housing herein described therefore provides an isolating sheathing which constitutes an electric shield between the electric units and the exterior, a weather shield preventing water and moisture from reaching the interior, a vibration shield preventing engine vibration from reaching certain units attached thereto and in addition provides a special internal shield separating one unit from electric radiations which might be produced by the other.

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 as new and desire to secure by Letters Patent is:

1. A combined mount and housing for electric ignition units for combustion engines comprising a water-proof box of conducting material having side walls and a removable lid of conducting material secured at the tops of the side walls with a water tight, electrically continuous connection, extensions on said box adapted for attachment to a combustion engine, said box having a regulator compartment and having a filter compartment and a metal partition means segregating said last compartment from the regulator compartment, electric units in said respective compartments electrically connected in circuit and grounded to the box, water resistant connections in the housing walls for electric leads respectively

5

to the electric units, said partition means having an aperture of relatively small size for an internal electric connection between the units.

2. A combined mount and housing for electric ignition units for combustion engines comprising a waterproof box of conducting material having side walls and a removable metal lid secured at the tops of the side walls with a water-tight and electrically continuous connection, said box having a regulator compartment and having a filter compartment comprising a metal partition and a separate metal cover segregating said last compartment from the regulator compartment, a filter unit having a protecting casing mounted in said filter compartment in spaced relation to the walls, the bottom and the cover thereof electrically grounded to the box, bosses on one side of the housing in mechanical and electrical engagement with one side of said unit, a voltage regulator unit having a casing mounted in the regulator compartment in spaced relation to walls, bottom and the lid of said housing, binding posts respectively on the filter and regulator units in the space between said units and the surrounding walls, water resistant connections in the housing walls for electric leads respectively to the filter and regulator units, said partition being recessed from the top edge for an internal electric connection between the filter unit and the regulator unit, a separate electric wire ground connection from the regulator unit casing to the interior of the bottom of said box, and shock mounts of non-electric resilient material between the regulator unit and the side of the housing supporting said filter unit.

6

3. A combined mount and housing for an electric ignition unit comprising a waterproof box of conducting material having side walls and a removable lid of conducting material secured at the tops of the side walls with a watertight, electrically continuous connection, a set of shock mounts comprising a cushion of shock absorbing, electrically insulating material having one side thereof spaced from the adjacent side of the box, a screw in the mount comprising a connection to the box and a second screw in the mount spaced from the first screw by the material of said mount and extending in another direction, an electric unit having a metal casing secured by said second screws upon the shock mounts and a separate flexible electric ground connection from the casing to the box.

ELTON C. HALLETT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,353,116	Lingle	Sept. 14, 1920
1,891,959	Sprong	Dec. 27, 1932
1,949,846	Slotsky	Mar. 6, 1934
2,163,843	Lansing et al.	June 27, 1939
2,253,531	Peters et al.	Aug. 26, 1941
2,312,485	Richmond	Mar. 2, 1943
2,314,225	Leece	Mar. 16, 1943
2,362,304	Reed et al.	Nov. 7, 1944
2,388,054	Hartzell	Oct. 30, 1945