

July 30, 1963

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3,099,797

RADIO RECEIVING SET FOR MOTOR CARS

Filed July 1, 1958

3 Sheets-Sheet 1

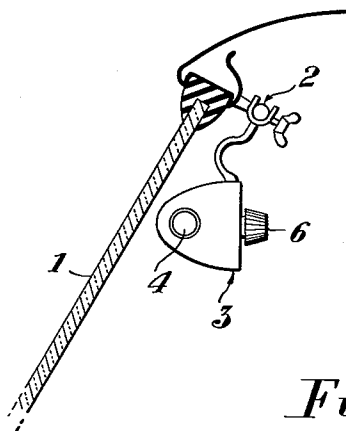
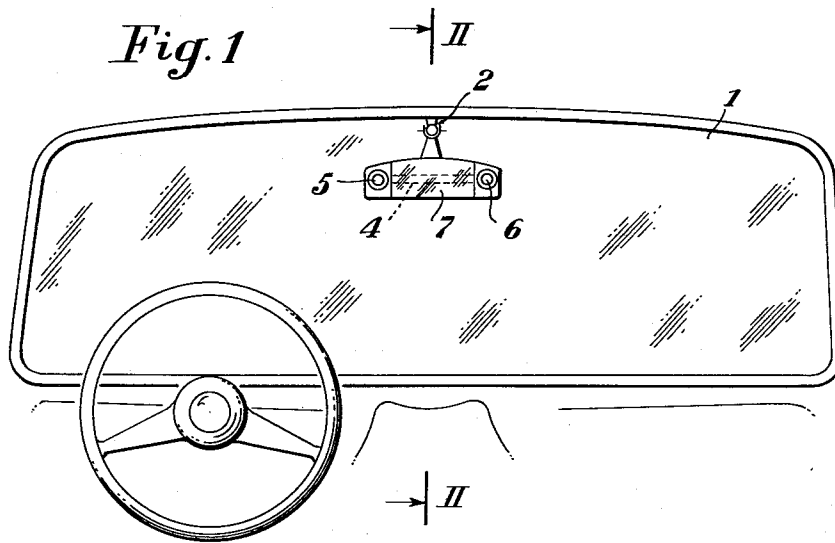


Fig. 2

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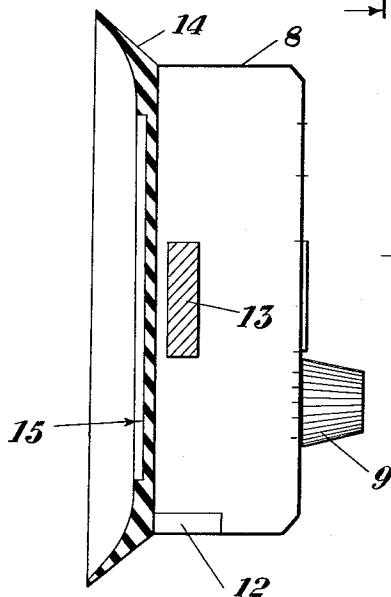
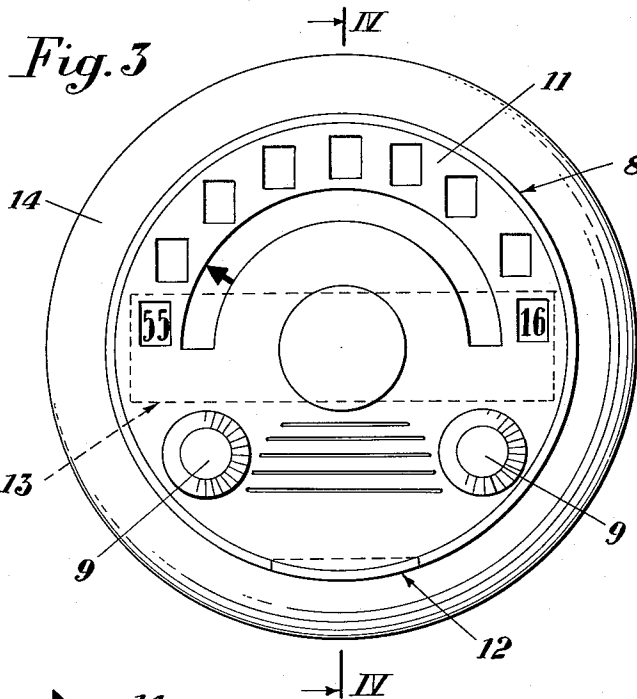
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Fig. 5

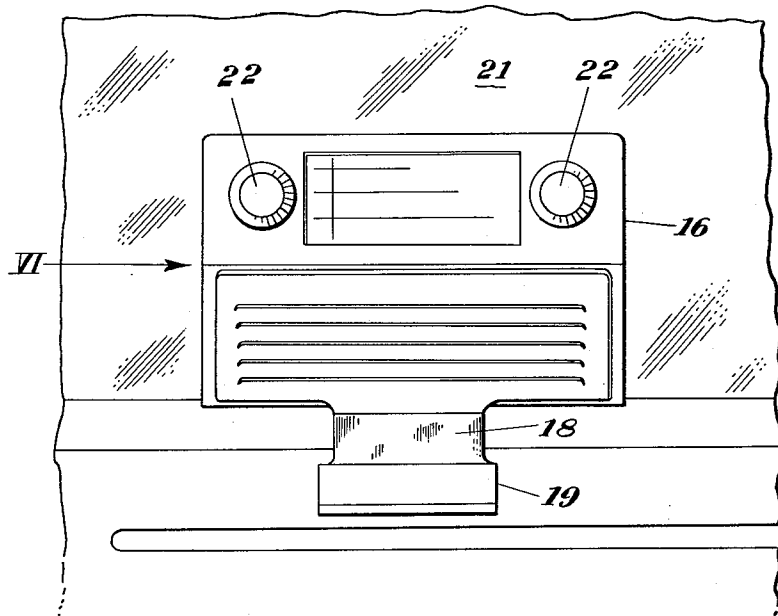
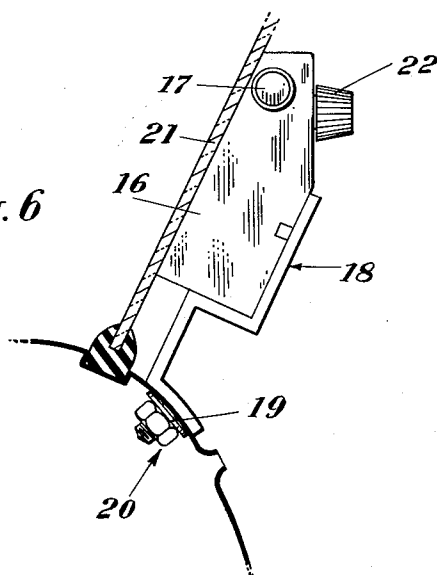


Fig. 6



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RADIO RECEIVING SET FOR MOTOR CARS

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4 Claims. (Cl. 325—312)

The present invention relates to a radio receiving set particularly suitable for use on motor cars.

The purpose aimed at by this invention is that of providing a radio receiving set apt to be mounted at its operative position with no mounting work on the motor car and particularly requiring the presence of no outer antenna on said motor car.

The technical problem set by this invention is solved on the ground of the possibilities offered by the present art, for the embodiment of radio receiving sets having very reduced size, by the transistors circuits directly operated under a voltage equal to that of the electrical equipment of the car, said receivers being therefore apt to allow any member destined to vary the voltage of the electrical equipment of the car to be dispensed with.

According to this invention a very reduced size radio receiver is provided, having an antenna of the frame type with a ferrite core, said antenna being incorporated in said receiver.

Also, according to this invention, the loud speaker is separated from the receiver proper, since the loud speaker due to its intrinsic needs cannot be embodied in such reduced size as provided for by this invention, and said loud speaker is mounted within the car body at a position most suitable to obtain a good response for all of the frequencies, said loud-speaker being connected to the receiver merely by a cord.

As aforesaid, the receiver according to this invention has a very reduced size, and this can be embodied using, besides the transistored circuits as aforesaid, a variable capacity tuning system with a minimum size capacitor, intermediate frequency stages embodied with transistors having very little dimensions, and, correspondingly, also low frequency and final stages embodied with very little size transformers.

Thus it will be possible to embody a radio receiver comprising elements known per se, and the feature of said receiver is that generally the size thereof is reduced to such an extent as to allow the mounting or application of the receiver in the car at the location necessary to obtain the coupling of the antenna with the electro-magnetic field with no excessive attenuation due to the shielding effect of the metal body. Characteristic locations of the radio receiver, in conformity with the above concepts, are the locations corresponding to the front windshield, or the rear or side windows of the body and generally in correspondence with any non metallic part of the car body.

The receiver may be mounted in several ways, the sole condition being that of causing the wave collector incorporated in the apparatus to be in position of receiving the radio signals.

The dimensional feature of minimum hindrance offered by this invention, allows specifically the mounting of the receiver onto the fore windshield with no disturbance to the vision through said windshield, while such a location locates the receiving antenna at the aforesaid suitable location.

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Hereinafter some preferred forms of this invention will be more particularly pointed out, in connection with the possibilities offered thereby, but it is to be understood that said forms will be disclosed only by way of example as the mounting of the receiver on the car body may be obtained in several ways, the sole need being that of causing the antenna incorporated in the receiver to be located in such a position as to be capable of receiving the radio signals. Therefore, according to this invention the radio receiver may be so embodied as to replace, taking up their functions, some elements already existing and applied for instance to the front windshield, such as the rear vision mirror, or the licence tag holder; alternatively the receiver may also be embodied as an individual element, and mounted by some means rendering its removal either very easy or very difficult according to whether it is provided for protecting the receiver against theft by removing it from the car or by fastening said receiver to said car in a particularly safe way.

This invention will be more particularly described with reference to the attached drawings showing, in a diagrammatical form some possible embodiments of this invention.

In the drawings:

FIG. 1 shows a fragmentary view, from inside of the car body, of the windshield to which is applied the radio receiver which has also the function of rear vision mirror;

FIG. 2 shows in slightly enlarged scale a cross-sectional view of FIG. 1 taken along the line II—II;

FIG. 3 is a front elevation of a radio receiver in the form of a shallow cylindrical box replacing the licence tag holder;

FIG. 4 shows a cross-sectional view of FIG. 3 taken along the line IV—IV and confined to the case, to the antenna and to a knob;

FIG. 5 is a fragmentary diagrammatical view showing the mounting of a radio receiver having no further function besides its specific function, by means of a supporting and blocking bracket;

FIG. 6 is a side view of the arrangement of FIG. 5 seen according to the arrow VI.

With reference to the drawings, FIGS. 1 and 2 show the instance wherein the radio receiver is substituted for the rear vision mirror. In said figures, 1 is the windshield of the motor car to the upper edge of which is fastened the usual articulated arm 2 supporting the mirror. According to this invention, the arm 2 instead of supporting the usual mirror, said arm supports the receiver which, due to its very reduced size, takes up the same front area which would be taken by the usual rear vision mirror. In FIG. 2 only the cross-sectional contour of the receiver 3 has been shown and merely for indicative purposes, since no relevance have the inner circuits of the apparatus to the effects of the invention. The case 3 contains the ferrite antenna 4 which is arranged close to the windshield 1 to embody the desired coupling conditions, with the electromagnetic field.

The articulated arm 2 contains, according to this invention the conductors for the electrical supply of the receiver as well as for the connection to the loud speaker (not shown in the figures).

FIG. 1 clearly shows that on the ends of the prismatic box, having a generally horizontal axis and forming the

case 3, are arranged turned towards the inside of the car body, the knobs 6 and 7 for controlling the volume and for tuning the receiver, respectively, while the central zone 7 of said box is occupied by the mirror which fulfills its usual function.

FIGS. 3 and 4 show the instance wherein the casing 8 of the receiver has a cylindrical shallow shape and is provided, on the surface faced towards the inside of the body car, with the knobs for the tuning and volume adjustment 9 and 10 respectively, as well as with the tuning scale. The casing 8 has at its lower portion the connection device 12 for the input conductors and for the connection to the loud speaker, and contains in its inside portion near to the surface facing towards the outside of the car, the ferrite antenna 13. Also in this instance, the antenna is arranged at the suitable position for the desired coupling. The casing 8, adjacent to its base remote from that carrying said knobs, is provided with a suction cup 14 allowing the apparatus to be steadily fastened to the windshield glass. In the central zone 15 of the suction cup 14 the licence tag of the car is to be applied, so that the unit fulfills the usual functions of the licence tag holder when the sucker 14 is applied to the inner surface of the windshield (not shown in figure).

FIGS. 5 and 6 relate to the instance according to which no task of pre-existing devices, to be replaced by the apparatus, is to be fulfilled by the receiver. In this case the illustrative embodiment has the sole purpose of indicating a possible mounting of the receiver in an arrangement which can be termed "antitheft." The receiver is generally denoted at 16 and is provided with the ferrite antenna 17; the casing 16 is rigid with the strong metal straps 18 which in turn are fastened to the car by the bolts 20 fastened to the cover 19 of the instrument board in a concealed location so that they can be removed only after troublesome and time consuming operations. The straps 18 hold the receiver so that the antenna 17 is adjacent to the windshield 21 of the car, while the control knobs 22 of the receiver are readily accessible. From the lower portion of the casing 16, and preferably between the windshield and the straps 18 are the wires for the connection to the battery and to the loudspeaker.

Obviously, other forms and other systems may be designed to mount the receiver at its suitable location, and it is therefore intended that although this invention has been illustrated and described in some preferred forms, it is to be understood that constructive variations may practically be adopted without departing from the scope of this invention.

I claim:

1. In a motor car having a framed windshield, an assembly comprising a rear view mirror, a hollow casing on the back of said mirror and lying entirely within the profile of the mirror as viewed from the reflecting side of the mirror, a radio receiver and amplifier circuit mounted within said casing, a frame-type antenna with a ferrite core connected to said radio receiver and amplifier circuit and mounted entirely within said casing along the portion thereof remote from the side of said casing on which said mirror is positioned, and mounting means on said casing adapted to mount said casing on the frame of the windshield within the car and in a position in which the mirror and casing depends from the frame and with the casing between the mirror and the windshield and the portion of said casing with the antenna therein closely adjacent the windshield, and a loud speaker mounted in said car at a point spaced from said assembly, and wire connecting said receiver and amplifier circuit to said loud speaker, whereby the antenna and receiver and amplifying system is positioned out of the line of vision of the driver of the motor car behind the rear view mirror in the otherwise unused space between the mirror and the windshield, and an antenna on the outside of the motor car and a connecting wire to the

radio receiver and amplifier circuit within the car is unnecessary.

2. In a motor car having a framed windshield, an assembly comprising a rear view mirror, a hollow casing on the back of said mirror and lying entirely within the profile of the mirror as viewed from the reflecting side of the mirror, a radio receiver and amplifier circuit mounted within said casing, a frame-type antenna with a ferrite core connected to said radio receiver and amplifier circuit and mounted entirely within said casing along the portion thereof remote from the side of said casing on which said mirror is positioned, and mounting means on said casing adapted to mount said casing on the frame of the windshield within the car and in a position in which the mirror and casing depends from the frame and with the casing between the mirror and the windshield and the portion of said casing with the antenna therein closely adjacent the windshield, whereby the antenna and receiving and amplifying system is positioned out of the line of vision of the driver of the motor car behind the rear view mirror in the otherwise unused space between the mirror and the windshield, and an antenna on the outside of the motor car and a connecting wire to the radio receiver and amplifier circuit within the car is unnecessary.

3. In a motor car, the combination of a framed windshield, an assembly comprising a rear view mirror, a hollow casing on the back of said mirror and lying entirely within the profile of the mirror as viewed from the reflecting side of the mirror, a radio receiver and amplifier circuit mounted within said casing, a frame-type antenna with a ferrite core connected to said radio receiver and amplifier circuit and mounted entirely within said casing along the portion thereof remote from the side of said casing on which said mirror is positioned, and mounting means on said casing mounting said casing on the frame of the windshield within the car and in a position in which the mirror and casing depend from the frame and which the casing between the mirror and the windshield and the portion of said casing with the antenna therein closely adjacent the windshield, whereby the antenna and receiving and amplifying system is positioned out of the line of vision of the driver of the motor car behind the rear view mirror in the otherwise unused space between the mirror and the windshield, and an antenna on the outside of the motor car and a connecting wire to the radio receiver and amplifier circuit within the car is unnecessary.

4. An assembly comprising a rear view mirror, a hollow casing on the back of said mirror and lying entirely within the profile of the mirror as viewed from the reflecting side of the mirror, a radio receiver and amplifier circuit mounted within said casing, a frame-type antenna with a ferrite core connected to said radio receiver and amplifier circuit and mounted entirely within said casing along the portion thereof remote from the side of said casing on which said mirror is positioned, and mounting means on said casing adapted to mount said casing on a frame of a windshield within a motor car in a position in which the mirror and casing depends from the frame and with the casing between the mirror and the windshield and the portion of the casing with the antenna therein closely adjacent the windshield, whereby the antenna and receiving and amplifying system is positioned out of the line of vision of the driver of the motor car behind the rear view mirror in the otherwise unused space between the mirror and the windshield, and an antenna on the outside of the motor car and a connecting wire to the radio receiver and amplifier circuit within the car is unnecessary.

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