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AUTOMOTIVE ANTENNA

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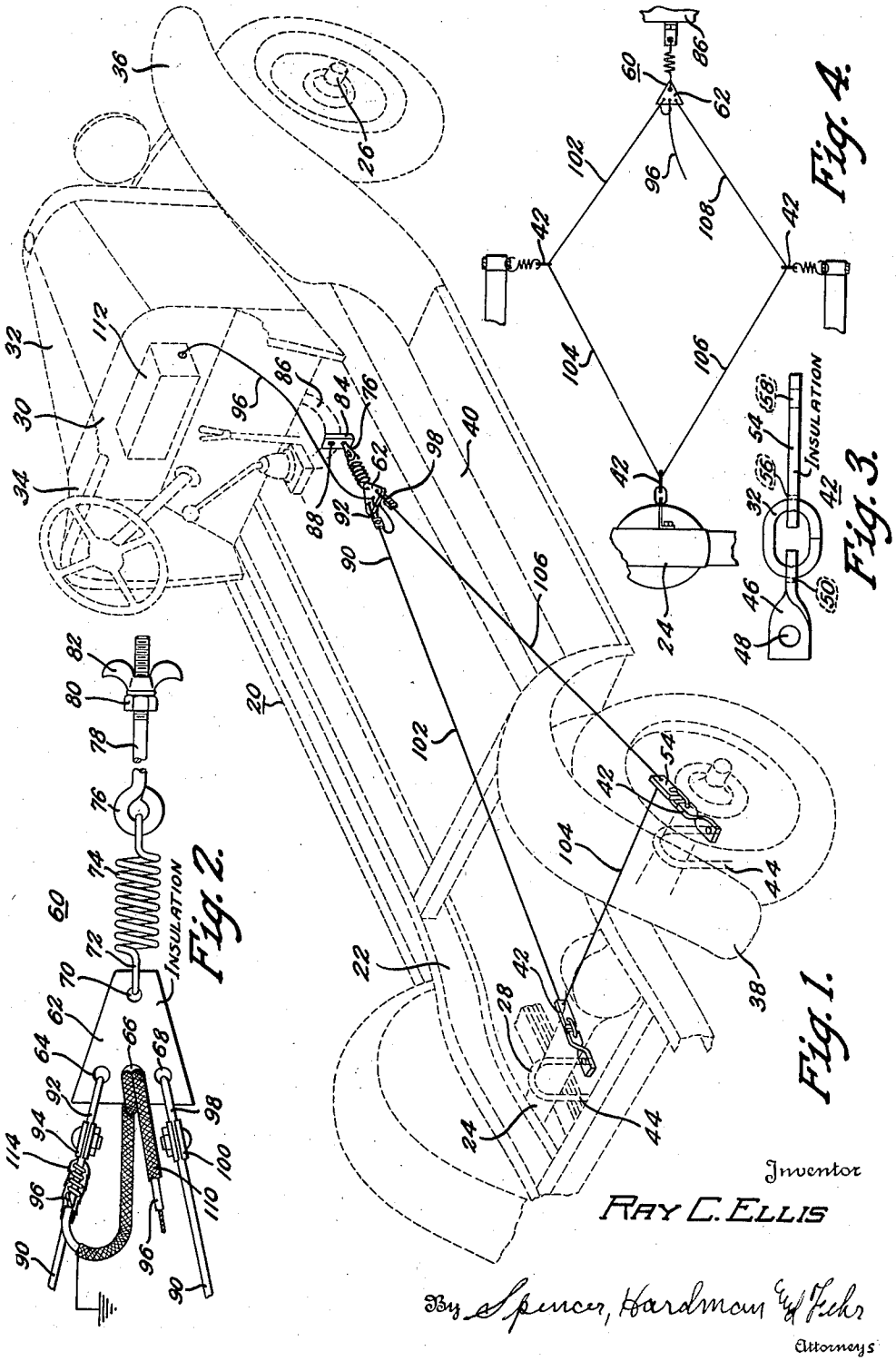


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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AUTOMOTIVE ANTENNA

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11 Claims. (Cl. 250—33)

This invention relates to radio equipped vehicles.

One of the objects of this invention is to mount an antenna for radio equipped vehicles without the necessity of defacing the vehicle. This has been accomplished by providing insulating supports for attachment to various parts of the vehicle structure and from which said antenna may be supported.

A further object of this invention is to provide an antenna kit for radio equipped vehicles that may be readily installed upon existing vehicles. This has been accomplished by providing an antenna wire with suitable attaching means as an article of manufacture, and that may be mounted upon the running gear of a vehicle either at the time the same comes from the production line of a manufacturing plant or at any subsequent period.

A further object of the invention is to provide an antenna for automotive installation that has a low capacity with respect to the body or frame, yet has sufficient effective height above the road surface to give good signal pick-up. This has been accomplished by insulatingly installing an antenna wire beneath the metallic body of the vehicle so as to be spaced substantially parallel to and as high above the surface of the road as the overhang of the body will permit.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a phantom view of an automotive vehicle structure illustrating the preferred installation of a radio antenna according to the instant invention.

Fig. 2 is a detail view of one of the insulators for adjustably supporting the antenna.

Fig. 3 is a detailed view of another of the insulators.

Fig. 4 is a view showing a modification of the antenna arrangement and its supports beneath the vehicle structure.

In the installation of radio receiver mechanism upon automotive vehicles it is necessary either to provide an antenna element that is built into the structure at the time the vehicle is manufactured in the plant, or else to add the antenna at a later time as an accessory. To add the antenna element at the time when the machine is manufactured amounts to an additional cost that is not justified when the vehicle is to be sold to one who does not care for the radio installation. In the second instance, that is where the antenna element is added as an accessory, it has almost universally proved to be unsatisfactory for one reason or another as improper installation, disfigurement of the vehicle structure either within or without, or else necessitating the services of an artisan in its installation due to the necessity of removing or replacing the upholstery of the top, or doing special machine work; otherwise the installation may amount to an objectionable protuberance from the regular outline of the vehicle where it will be subject to undue fracture, and in all events practically unsatisfactory.

With an object to solve these problems applicant has devised an antenna for radio equipped automotive vehicles that can be installed by one of ordinary experience, and an antenna that when installed will not be objectionable in appearance and in fact be noticeable only to the searching eye, yet will be very efficient in picking up signals under practically all conditions. With particular reference to the drawing, **20** is indicative of an automotive vehicle structure having a frame **22** supported upon the axles **24** and **26** as by the usual spring assembly and clips **28** or equivalent devices. The vehicle usually includes an engine or motor mounted in front of a dash **30** and enclosed by the body structure as **32**, that joins the cowl **34** which merges into the cab structure (not shown) and all of which is flanked by the fenders **36** and **38** spanned by the toe board **40**. For purpose of illustration the major portion of the body of the vehicle has been torn away and only so much of the vehicle as is necessary for illustrating a support for the antenna has been illustrated.

A plurality of insulating supports **42** are provided and are designed to be secured to some part of the vehicle structure as the spring U-bolt **44** of the rear axle substantially as illustrated in Fig. 1 though it will be obvious to one skilled in the art that they may be secured to the forward shackles of the rear springs and to the differential housing substantially as illustrated in Fig. 4, or even to other parts of the vehicle structure as may be desired. These insulating supports, or insulators as they may be called, may comprise a metallic link **46** apertured at **48** to receive one leg of a U-bolt or other means of attachment, and a second aperture **50** for receiving a ring or link **52** engaged by a nonconducting element **54** pro-

vided with the end apertures 56 and 58 all as illustrated in Fig. 3. The link 46 may or may not be twisted depending upon the provisions of the vehicle structure to which it is to be attached.

An additional insulating support, or insulator 60 is provided and incorporates means for attaching it to the vehicle structure preferably at some point along the medial line of the vehicle, though it is fully adaptable to mounting at some lateral point as well. This insulator is fully illustrated in detail in Fig. 2, and essentially comprises a nonconducting element 62 providing the apertures 64, 66 and 68 in one end for a purpose later to be described and at least another aperture 70 in the other end for engagement by a hook end 72 of a spring 74 secured to the eye 76 of a bolt or screw device 78 carrying the double nuts 80 and 82. To cooperate with the eye bolt 78 there is provided a bracket member 84 that may be secured to a convenient portion of the vehicle structure, as the fly-wheel or transmission housing 86, by means of a screw 88, the bracket 84 having a second aperture for receiving the shank of the bolt 78.

An antenna wire of sufficient length to thread through all of the insulators 42 and have its ends connected to the insulator 60 is provided, and is preferably one of rust proof character so as not to be materially affected by weather conditions or stones, mud, water etc. that may be splashed up from the road. In the physical embodiment a cable 90 of about one-eighth inch diameter, stranded, galvanized steel wire has one end 92 passed through the aperture 64 of the member 62 with its end doubled over and secured by a clamp device 94, and thence has this prepared end connected to a lead-in wire 96 that is anchored to the member 62 by means of the aperture 66. When installation is completed upon the vehicle, the antenna wire 90 after being anchored to the member 62, will have been passed through the end aperture 58 of each insulator 42 substantially as illustrated in Figs. 1 or 4, and the free end 98 brought back to the member 62 where it passes through the aperture 68 and there secured by an appropriate clamp 100 as illustrated in detail in Fig. 2. Only surplus of the conductor 90 may be removed or if so desired it may be carried to the receiver and be adopted as the lead-in wire in place of the element 96 hereinbefore referred to. This provides an antenna assembly beneath the vehicle structure of substantially open loop type and arranged in polylateral form so as to have the legs 102, 104, 106, 108 etc.

Concerning the lead-in wire 96 whether it is of the attached type or of the continuous type it is preferred that this be shielded so as to carry the metallic covering 110 and is furnished in sufficient length to make proper connection with a radio receiver 112 mounted on the dash 30 or other convenient portion of the vehicle. The shield 110 may be connected to ground at either end as indicated but a ground at one end may be sufficient and when this obtains it is preferred that the grounding of the shield be made at the receiver end. It is desirable that the lead-in wire 96 be securely and electrically joined to the end 92 of the antenna wire in the shop at the time of manufacture, so that the best possible connections may be afforded, and so that uniform results may be obtained. This has been accomplished by securely anchoring both the antenna wire 90 and the lead-in wire 96 to the non-conducting member 62 as has been described hereinbefore. It is also preferable where the antenna wire and lead-in are of the composite type to seal the connection between the wire 96 and the antenna 90 as by means of tape or other means 114.

Upon installation of the antenna, the attendant has only to attach the several insulating supports 42 and 60 upon the vehicle structure, thence thread the end 98 of the antenna wire through the members 54 of the similar insulators and bring the wire back to the member 62 where he draws it tight and attaches the clamp 100 substantially as illustrated. By running up the nuts 80 and 82 upon the bolt 78 all slack is taken up in the antenna wire and the same is maintained in substantially uniform and constant relation with respect to road surface. The attendant then has only to attach the lead-in 96 to the receiver 112 and the installation is complete.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A radio antenna installation for vehicles, comprising in combination, a pair of insulating supports mounted on a low part and near the rear of said vehicle, another insulator mounted substantially in the same level plane on the forward part of the vehicle, an antenna wire secured to said last mentioned insulator and threaded through each of said other insulators, and a lead-in wire anchored to said third insulator and electrically connected to one end of said antenna wire.

2. A radio antenna installation for vehicles, comprising in combination, a pair of insulating supports mounted on a low part and near the rear of said vehicle, another insulator mounted substantially in the same level plane on the forward part of the vehicle, an antenna wire secured to said last mentioned insulator and threaded through each of said other insulators, and means interposed between one of said insulators and said vehicle structure for tensioning said antenna wire.

3. In a portable radio device, the combination with the running gear of a motor vehicle, of a plurality of insulators supported in triangular form from and underneath the vehicle structure, an antenna wire having its ends secured to one of the insulators and threaded through the remaining insulators, means supporting one of the insulators for tensioning the antenna wire, and means provided by one of the insulators for anchoring a lead-in wire from which connection may be made to the antenna wire.

4. In a portable radio device, the combination with the running gear of a motor vehicle, of a plurality of insulators supported underneath the said running gear, said insulators being arranged in polygonal form, an antenna wire supported by each of said insulators, a lead-in wire joined to one end of said antenna wire, and means including one of said insulators for keeping said antenna wire taut.

5. In a vehicle, an underneath antenna, comprising a wire arranged in a substantially closed triangle, a plurality of insulators mounted on the chassis of said vehicle for supporting said antenna, and means supported from said chassis for tensioning said antenna wire yet providing

for relative movement between chassis portions by which said antenna is supported.

6. In a vehicle, an underneath antenna, a plurality of insulators, means supporting some of said insulators from the spring clips of said vehicle, means supporting another of said insulators from the gear housing of said vehicle, means including said insulators for securing the antenna beneath the vehicle, and means providing for relative movement between one of said insulators and the remaining ones incident to the movement of their supporting means.

7. An article of manufacture for installation upon radio system equipped vehicles, comprising in combination, a pair of similar insulating supports for mounting adjacent the rear axle of a vehicle, an additional insulating support and an adjustable device secured thereto, means for mounting all of said supports on relatively movable parts of said vehicle frame, an antenna wire secured to one of the insulators and adapted to be threaded through each of the remaining insulators, and a lead-in wire attached to one end of said antenna wire, said adjustable device adapted to tighten the antenna wire between each of its supports.

8. An antenna kit for installation beneath a radio system equipped automotive vehicle, comprising in combination, a plurality of insulators attachable to the vehicle structure and for supporting a radio antenna, means for securing the insulators to relatively movable parts of the vehicle, an antenna wire threaded through each of said insulators to form an open loop, a lead-in wire for anchorage to one of said insulators and connected to said antenna wire, one of said insulator supporting means comprising an adjustable device for yieldingly supporting one of said insulators from said vehicle structure, and adapted to keep the antenna wire tight througout all of its branches.

9. A radio antenna installation for vehicles having a plurality of relatively movable parts, comprising in combination, a pair of insulating supports mounted on separate ones of said vehicle parts, another insulator mounted on one of said vehicle parts that is relatively movable to the other vehicle parts, and an antenna wire secured to said last mentioned insulator and threaded through each of the other insulators, and means interposed between said last mentioned insulator and its corresponding vehicle part for maintaining tension on said antenna wire.

10. A radio antenna installation for vehicles having parts relatively movable to accommodate flexibility during vehicle travel, the combination comprising, insulators mounted on one of said relatively movable vehicle parts, at least one other insulator mounted on a vehicle part relatively movable from the first mentioned vehicle parts, and an antenna wire secured to one of said insulators and threaded through each of the other insulators, and yielding means inserted between one of said insulators and its associated vehicle part for tensioning the antenna during all conditions of relative movement of the vehicle parts.

11. In a vehicle provided with spring clips and a gear housing, a plurality of insulators, springs havings one end secured to certain of said insulators and their other ends to said spring clips, a spring having one end secured to another of said insulators and its other end connected to said gear housing, an elongated flexible antenna connected to and supported by each of said insulators and a lead-in having one end connected to said antenna.

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