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ANTENNA

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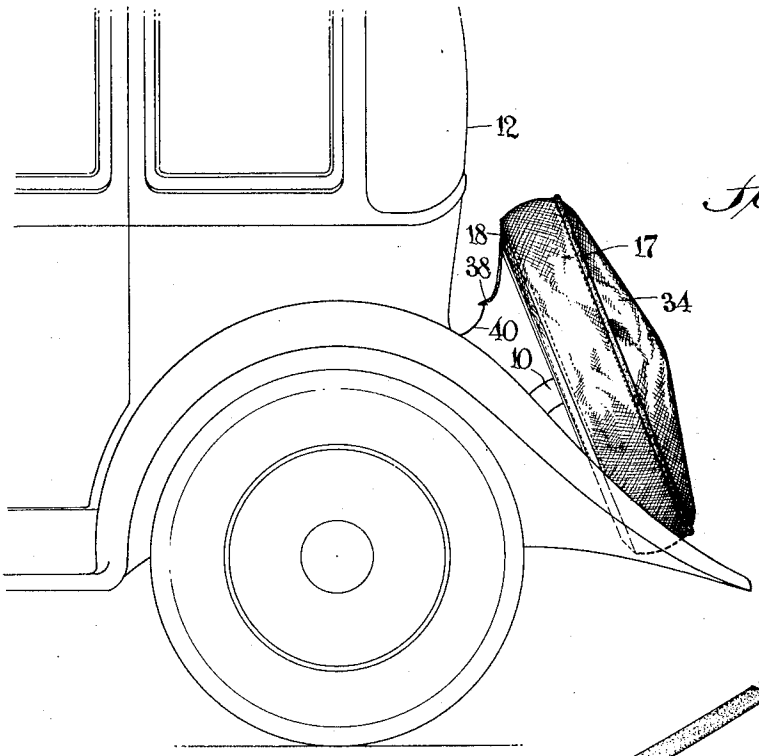



Fig. 1.

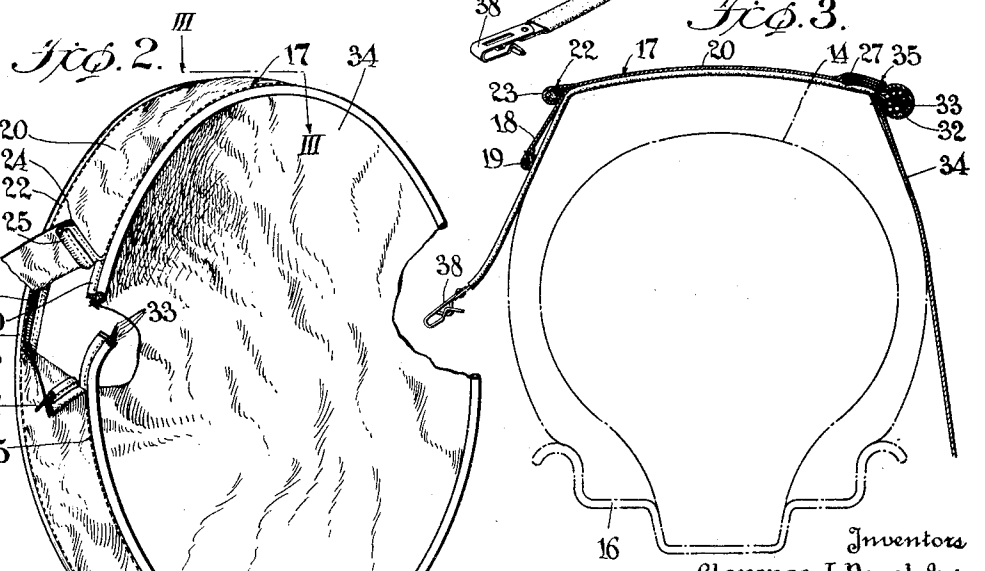



Fig. 4.

Fig. 3.




Fig. 2.

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# UNITED STATES PATENT OFFICE

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## ANTENNA

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This invention relates to installations for radio receiving sets and it has particular relation to an antenna for radio receiving sets mounted in motor vehicles.

Heretofore, it has been customary to install an antenna in a roof of a motor vehicle body to accommodate a radio receiving set, and others have been installed along the running board and frame of the vehicle. While these forms of antenna are more or less efficient they involve considerable expense in modifying the vehicle roof and other vehicle portions, and if the radio is installed after the vehicle has been sold to the consumer, it is necessary to remove elements of the vehicle construction which were not intended to be disturbed after the manufacture thereof. Accordingly, in addition to being considerably expensive, these forms of radio antenna installation involve the removal and replacing of elements of the vehicle which are likely to be injured during the installation.

Moreover, in these forms of antenna and radio installation in motor vehicles, it is necessary to provide dampening devices for the ignition system in order to avoid so-called interference to proper radio reception. Since the frame of the motor vehicle serves as a ground for the antenna, considerable care must be exercised in order to insure proper insulation therefrom. It is, of course, desirable that the antenna be as long as possible in the restricted area occupied by the vehicle, and accordingly it is customary to arrange the antenna lengthwise of the vehicle. In addition to the disadvantages of removing portions of the vehicle top to provide suitable installation for the antenna therein the latter is also subject to interference from high tension wires, telegraph wires, and the like, that are generally disposed parallel to highways. This interference is caused by the magnetic lines of force of the antenna intersecting the magnetic lines of force of the wires.

According to this invention it is proposed to avoid or minimize all of the disadvantages of the antenna referred to above by installing a loop or coil form of antenna as a part of a tire cover for a spare tire. Since the tire cover is customarily composed of, or can be composed of, insulating material the problem of insulating the antenna is not a serious one. As a matter of fact, the tire itself which comprises rubber compound provides a very efficient and adequate insulation for the antenna. An antenna of this kind is arranged circumferentially of the cover and is provided with detachable connections to a radio receiving set installed in the vehicle, and it is so far removed from the ignition system as to be practically immune from interference from any of the electrical or metallic parts of the motor vehicle as the radio is operated. Also, the loop or coils of the antenna are arranged in a plane substantially transversely of the direction of travel of the motor vehicle, and accordingly the lines of force do not materially affect the magnetic lines of force of the wires running parallel to the highway. The invention therefore comprehends a combined tire cover and radio antenna adaptable for use upon various types and sizes of motor vehicles and the invention can be applied without disturbing any of the existing elements of various types of motor vehicles.

For a better understanding of the invention reference may now be had to the accompanying drawing forming a part of this specification, of which

Fig. 1 is a fragmentary view of a motor vehicle having a tire cover mounted upon a spare tire and having the invention included therein;

Fig. 2 is a fragmentary perspective of a combined tire cover and antenna;

Fig. 3 is a cross section taken substantially along the line III—III of Fig. 1; and

Fig. 4 is a perspective of a conductor for attaching the antenna to a conductor of a motor vehicle radio.

Referring particularly to Fig. 1 a suitable spare tire support 10 is shown connected to the rear end of a motor vehicle 12 and a tire 14 and rim 16 are supported in conventional manner thereon. A tire cover 17 of suitable material, such as fabric, leather, rubberized fabric, or other rubberized compound, is removably disposed about the tire and is provided with an inner flap 18 that has an arc-

uate member 19 mounted thereon and adapted to spring over the tire to hold the cover in its proper position thereon. An outer circumferential section 20 of the cover is secured by means of a seam 22 to the flap 18 and a bead 23 of stiffening material is disposed in the seam to assist in maintaining the proper contour of the cover.

The edge portion of the section 20 opposite the seam 22 is folded twice, as indicated at 24 and 25, in opposite directions and sewed, and a stiffening member 27 is disposed in the loop of the folded edge portion. This stiffening material also assists in maintaining the proper shape of the cover. A relatively narrow strip 30 of suitable material such as leather, rubberized fabric, or the like, is provided with a circumferential annular recess 32 and forms a sheath for receiving a number of coils of insulated wire 33 that serve as an antenna for the radio receiving set (not shown) mounted in the vehicle. An outer disc-like or annular wall 34 composed of material similar to the material constituting the section 20 is secured by means of a seam 35 to the strip 30 on the section 20. This seam also extends through the strip 30.

It has been found satisfactory to arrange the antenna upon the outer corner or outer thread portion of the tire in order to facilitate the mounting of the cover upon the tire. Not only does the antenna serve its functions in conjunction with the radio receiving set, but it also provides a reinforcing element for the tire cover. An insulated conductor 36, composed of material, such as metallic tape or wire, is secured, as indicated at 37, to one end of the antenna wire 33 and is adapted to extend about the inner surface of the cover and transversely over the tire. Suitable fastening devices 38 are provided for securing the conductor 36 to a conductor 40 leading to the radio in the motor vehicle. The sheath strip 30 in which the antenna wires are confined requires only a very small space and accordingly it does not interfere with the appearance of the tire cover. Moreover, it does not interfere in any way with the mounting of the cover upon the tire.

It is to be understood that the antenna can be arranged in other locations in the tire cover than that shown, and that the location illustrated has been found to be satisfactory and advantageous for ordinary purposes of the invention. However, in this arrangement, the antenna is located at the most remote and desirable portion of the motor vehicle with respect to the engine and ignition system. Thus a maximum efficiency of the radio receiving set is insured and it is not materially interfered with by the metal frame parts of the car or by the electrical elements utilized in conjunction with the ignition system that are ordinarily arranged in the front portion of the motor vehicle. It is apparent that the carcass of the spare tire itself serves as an efficient insulator and support for the antenna, and since its axis extend lengthwise of the motor vehicle it provides a most favorable location for the antenna with respect to the telegraph and power wires that are disposed along the highways.

Although only one form of the invention has been shown and described in detail it will be apparent to those skilled in the art that the invention is not so limited but that various changes may be made therein without departing from the spirit of the invention or from the scope of the appended claim.

What is claimed is:

An antenna unit for use with automobile radio equipment comprising a band-like member of flexible material of substantially the same diameter as that of the spare tire casing of an automobile, and adapted to be snugly and concentrically detachably mounted upon the tread portion of said tire casing, a circular member of flexible material disposed within the confines of said band-like member having its peripheral edge secured to the outboard edge of said band-like member and adapted to overlie and cover the outboard side wall of the tire casing, a tubular member of ring form having substantially the same diameter as said circular member and externally secured to said band-like member and said circular member at their common edge, a loop antenna element disposed within and completely encased by said tubular member, and a lead-in connection transversely disposed within, protected and concealed by said band-like member, one end of which lead-in connection passes through said tubular member and is electrically connected to said loop-antenna element, the other end of which is adapted for connection to radio equipment carried by said automobile.

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