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W. L. CARLSON ET AL

2,249,416

ANTENNA SYSTEM

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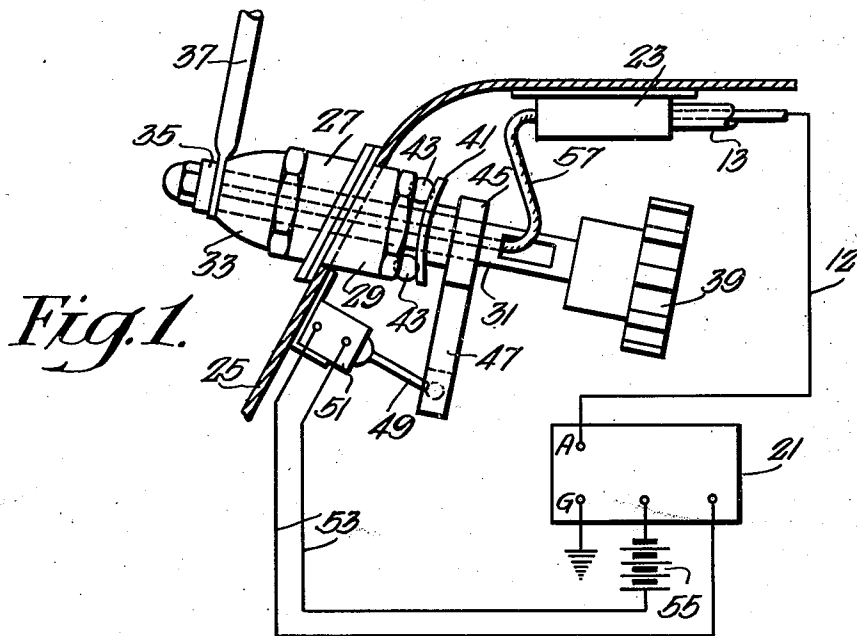


Fig. 2.

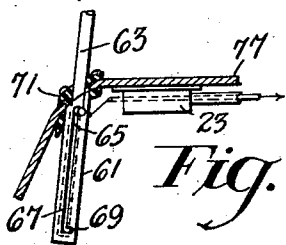
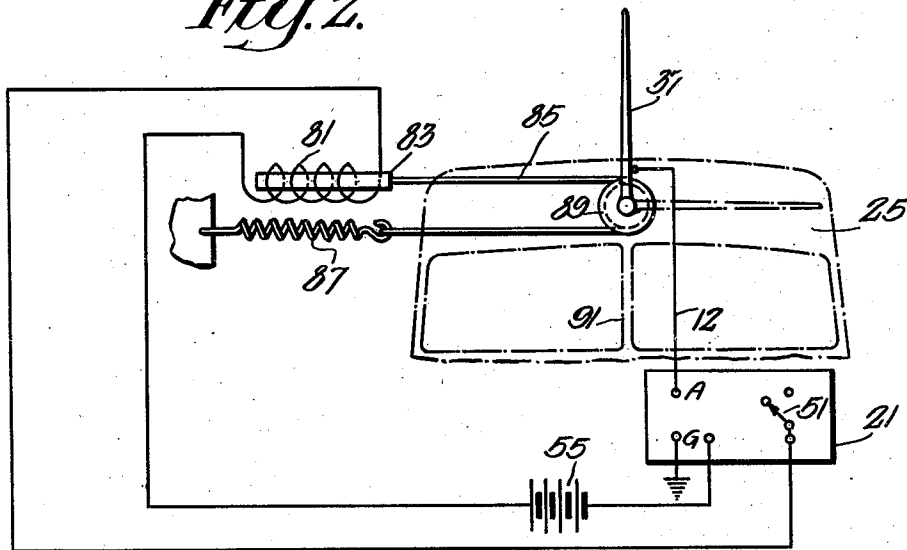


Fig. 3.

Inventors
Mendell L. Carlson
& William H. Conron
J. J. Huff
 Attorney

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ANTENNA SYSTEM

Wendell L. Carlson and William H. Conron, Had-
donfield, N. J., assignors to Radio Corporation
of America, a corporation of Delaware

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6 Claims. (Cl. 250—33)

Our invention relates to antennas and antenna-radio controls. More specifically, our invention relates to an antenna which is readily demountable, and therefore especially effective on mobile vehicles.

One of the problems which arise in a radio installation on an automobile, aircraft or the like is the antenna system. Generally the physical dimensions of the antenna must be limited. In some instances the antenna may be effective as a collector of radio frequency energy, but the ratio of ignition noise to the received signal is unfavorable. In other installations, the noise-to-signal ratio is favorable but the antenna is an insufficient collector of the desired signals. These difficulties are especially troublesome in an automobile with a metal top.

This invention contemplates an antenna of short length but of suitable effective height for the reception of radio energy. An object of our invention is to provide an antenna for a mobile vehicle with means for readily demounting the antenna when it is not in use. Another object is to simultaneously demount the antenna and disconnect the power supply from the associated radio apparatus. Another object is to erect an antenna in response to energization of radio apparatus.

This application is a division-in-part of our application Serial No. 85,022, filed June 13, 1936.

The antenna of our invention is schematically shown in Figure 1, which shows our antenna installed on the metal top or header of an automobile, as shown in Fig. 2 of our parent application Serial No. 85,022; and

Figure 2 shows schematically a modification of our invention, added to the divisible subject matter of our said parent application.

Figure 3 is a modification of the antenna structure shown in Fig. 1, as disclosed in applicants' original application.

One application of our invention is illustrated in Fig. 1, in which a portion of the metal roof adjacent the windshield of an automobile (known as the header) is represented by reference numeral 25. A split bushing 27, 29 is fastened to the header 25. A hollow shaft 31 passes through the bushing. On one end of the shaft, and suitably insulated therefrom by bushings 33, 35, is fastened a rod-like antenna member 37. On the opposite end of the hollow shaft is secured a handle 39.

A means for retaining the antenna member in vertical or horizontal position is indicated by the spring 41, balls 43 and ball sockets or detents

(not shown). The spring is fixedly held, with respect to the shaft, by the collar 45. A fork 47, extending from the collar 45, engages the arm 49 of a toggle switch 51. Leads 53 from the toggle switch complete the power supply circuit 55 for the receiver 21, when the antenna is in a substantially vertical position. The switch 51 opens the power circuit when the antenna is in the horizontal position.

The antenna member 37 is connected by a flexible lead 57 which extends through the hollow shaft to the antenna coupling unit 23, shown and described in our said parent application. The antenna coupling circuits are located within the shielded container 23 which is positioned adjacent the base of the antenna, and are connected to a radio receiver 21 through a shielded lead-in 12, 13. The balance of the system is substantially as described in our said parent application, Serial No. 85,022. By way of example, the antenna member may be a streamlined rod about one-quarter inch in diameter and from one foot to two feet long for reception of the present-day broadcast band.

Referring to our modification in Fig. 2, a solenoid coil 81, having a magnetic core 83, is connected in circuit with the car battery 55 and the power circuits in the radio device, preferably in series therewith. When the power switch 51 is manipulated to turn the device on, the current energizing the radio apparatus is caused to flow through the coil 81, drawing the core 83 into the position indicated and erecting the antenna 37 into the normal operating position, by means of any suitable mechanical link work. As an example of a mechanical movement, I have illustrated a flexible belt, cord or wire 85, connected from the core to a spring 87, against which the core reacts, and around a pulley 89 attached to the antenna 37, using any well known non-slipping means. When the current is turned off, the solenoid is deenergized and the antenna is swung into its non-operating position, shown in dotted lines, by means of the spring 87.

While we have shown the antenna rod in a horizontal position transverse to the direction of travel of the vehicle and parallel to the top of the windshield when lowered through an arc of 90 degrees to its demounted or non-operating position, it could very readily be swung through an angle of 180 degrees to a downward position along the upright middle of the windshield at 91.

An alternative arrangement is illustrated in Figure 3. In this application, a hollow member 61 may be inserted in the corner post of the car.

or other suitable position, and insulated from the metal parts of the car body. The antenna member 63 is telescoped within the hollow member 61. The antenna may be slid within the hollow member by handle 65. This handle projects through a slot 67 and engages bayonet catches 69 to lock the antenna in extended or retracted position. A suitable insulated gasket 71 makes the installation weatherproof.

The foregoing application of our invention illustrates an antenna which is suitable for automobiles. With slight modifications, the antenna may be adapted to aircraft, railway trains, mobile tanks and the like. It should be understood that a plurality of antennas may be used without departing from our invention. In speaking of the positions of the antenna as horizontal and vertical, or non-operating and operating, respectively, it will be understood that these positions are not critical, and this terminology is used in a relative sense. For example, the antenna will operate practically the same whether it is truly vertical or inclined several degrees. In carrying out our invention, it will be apparent that various modifications may be made by those skilled in the art without departing from the spirit and scope of the invention itself.

We claim as our invention:

1. In an antenna-radio control system, radio apparatus, a movable antenna member connected to said apparatus and mounted in a normally non-operating downward position, a power source for energizing said apparatus, electromagnetic means responsive to current flow in said apparatus from said power source for erecting said antenna member to an operating position and holding same in said operating position, and spring means for returning said member to said downward position in response to a reduction of said current flow.

2. A motor vehicle antenna system comprising a tubular support adapted to be secured within an opening of a motor vehicle top, means for insulating the antenna system from the top of the vehicle, an antenna, means for mounting the antenna at the upper end of the tubular support, a control rod operating through the tubular support and having connection with the antenna whereby the antenna may be moved to

its active or inactive position, and means for holding the antenna in its positions of adjustment.

3. An antenna system for a moving vehicle having a metallic top portion and an inside compartment, comprising a bearing member extending from an opening in said top portion into said compartment, an antenna collecting member comprising an elongated metallic rod-like structure, an operating member movable within and carried by said bearing member engaging said collecting member, and actuating means within said compartment attached to said operating member for extending said collecting member into effective operating position above said top portion and for retracting said collecting member.

4. An antenna system for a moving vehicle having a windshield, a metallic top portion and an inner compartment, comprising an active antenna member of rod-like structure, a fixed bearing member extending from an opening in said top portion into said compartment, an elongated antenna support member revolvably mounted within said bearing for supporting said active antenna member at substantially right angles to said support member, and control structure within said compartment for rotating said antenna member from an operative to a substantially inoperative position.

5. The invention as set forth in claim 4 wherein said antenna member is mounted to swing from a position substantially above said top portion to a position adjacent said windshield below said top portion.

6. An antenna-radio control system for a motor vehicle comprising a radio communication apparatus, a retractable antenna member mounted on the roof of said vehicle and operatively connected to said apparatus, a power source having a snap switch connected to energize said apparatus, a handle attached to said antenna member for manually elevating said antenna into an operative position, structure on said handle for automatically actuating said switch when said antenna is elevated and retracted.

WENDELL L. CARLSON.
WILLIAM H. CONRON.