

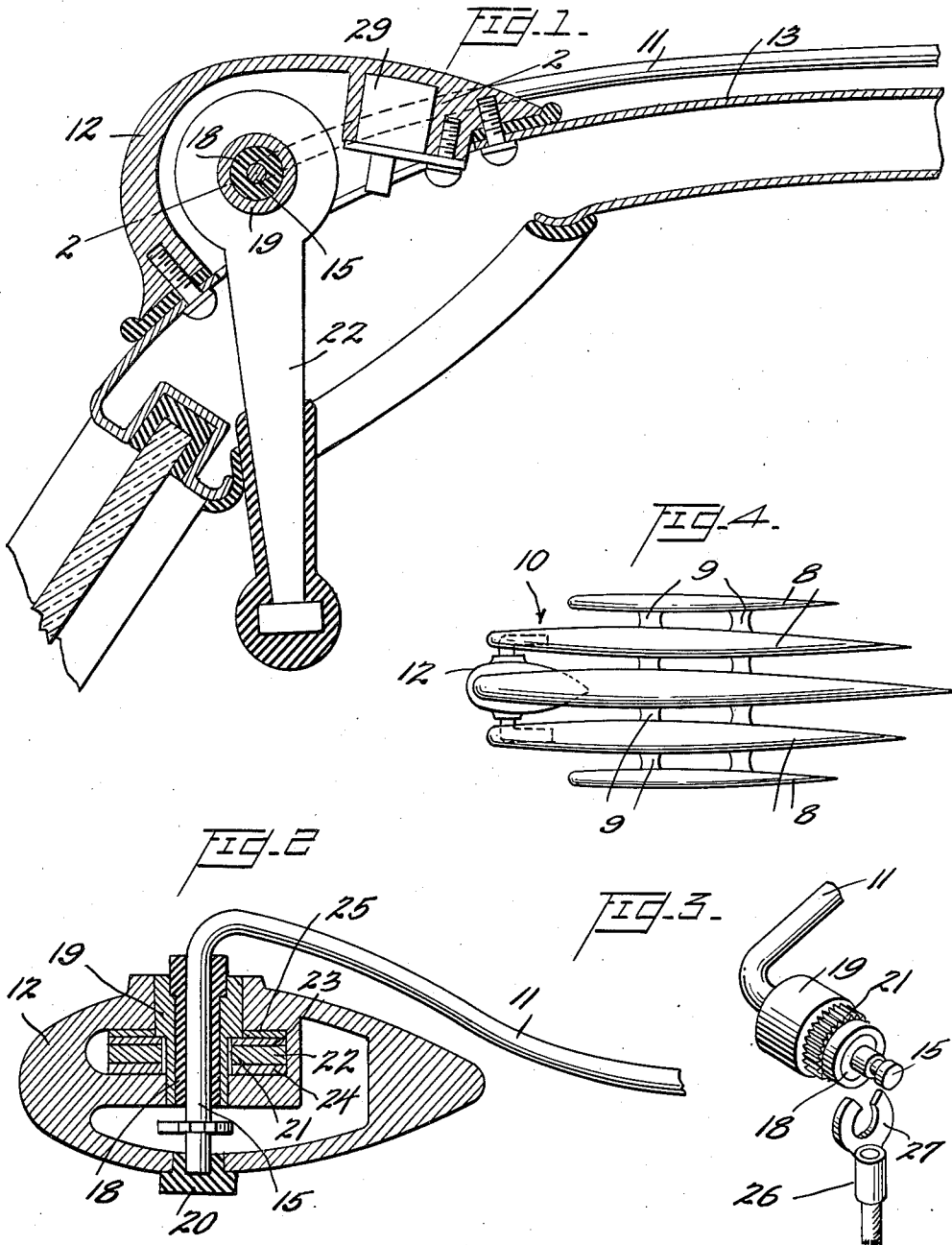
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C. R. PATON

2,334,503

MOTOR VEHICLE ANTENNA

Original Filed Nov. 23, 1936 2 Sheets-Sheet 1



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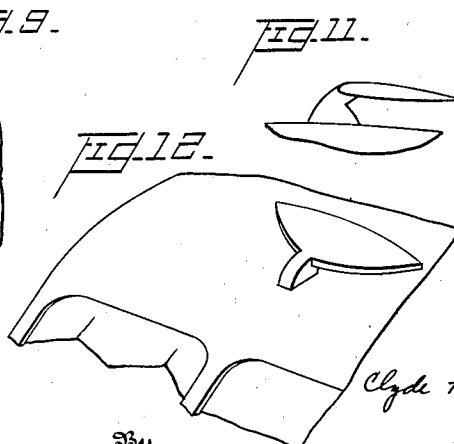
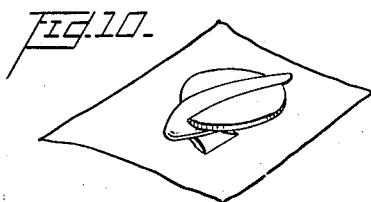
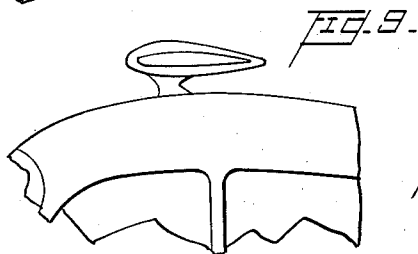
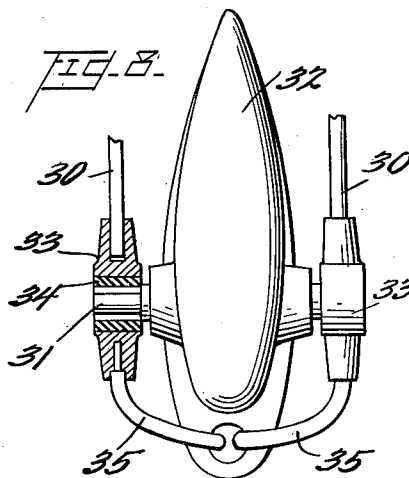
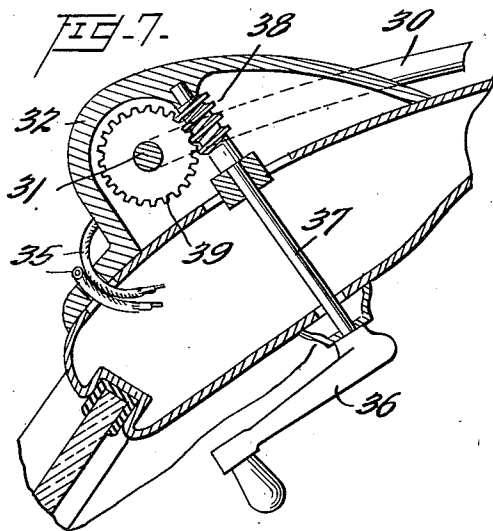
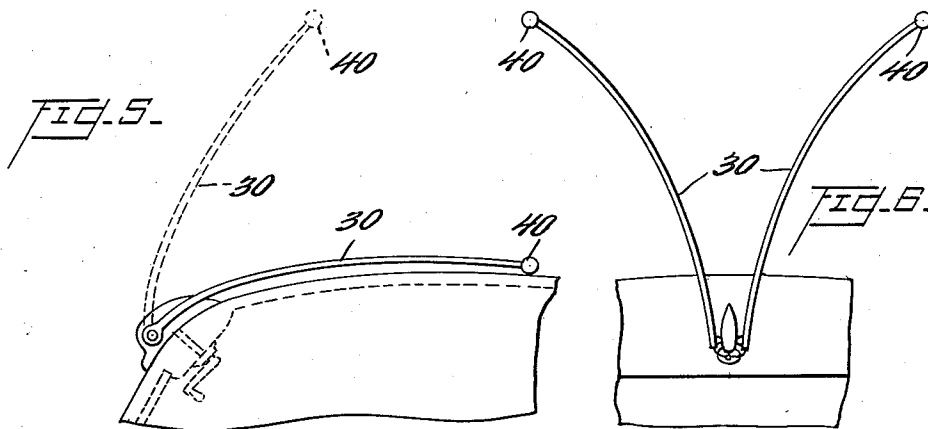
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MOTOR VEHICLE ANTENNA

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2 Sheets-Sheet 2



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MOTOR VEHICLE ANTENNA

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Original application November 23, 1936, Serial
No. 112,416. Divided and this application Oc-
tober 2, 1940, Serial No. 359,437

4 Claims. (Cl. 250—33)

The present invention relates to radio apparatus for use in connection with motor vehicles, and particularly to an antenna system for association with vehicles of the closed type, this application constituting a division of my prior application, Serial No. 112,416, filed November 23, 1936, now Patent 2,233,222.

With the advent of steel vehicle tops, the location of radio antenna has become a serious problem, since the antenna cannot be built into the top structure, or located therebeneath, because of the shielding effect of the top. Antennas have been placed below the running boards and at other points beneath the vehicle, but it has been found that the location of the antenna close to the ground is disadvantageous, in that the antenna collects static electricity generated in the tires, resulting in noisy reception, and for other reasons.

Other attempts have been made, such as employing an insulated rear compartment door, or an insulated windshield column, as an antenna, but it has been found that the most satisfactory disposition of the antenna is to locate it as far as possible from the ground and from the vehicle body.

The whip type of antenna, comprising a short rod or strip of metal supported at one end, gives satisfactory results, but is unsightly and is also subject to damage when the vehicle is driven under low overhead structures.

The present invention has for an object the provision of an antenna in association with the top of a vehicle in such a manner as to reduce its unsightliness and minimize the danger of injury to the antenna. A further object is the provision of a whip type antenna in combination with means for elevating it into a position above the vehicle top, for optimum reception, and lowering it to an inconspicuous position when not in use.

A further object is the provision of antenna means adapted to cause a minimum of wind resistance while the vehicle is in motion. Another object is the provision of an antenna associated with the top of a vehicle, and means operable from within the vehicle for raising and lowering the antenna.

Other and further objects, features and advantages will appear from the description which follows, together with the accompanying drawings, in which:

Figure 1 is a vertical sectional view illustrating a retractible antenna system embodying the principles of the invention;

Figure 2 is a horizontal sectional view taken substantially on the line 2—2 of Figure 1;

Figure 3 is a perspective view illustrating a detail of the structure shown in Figure 2;

5 Figure 4 is a plan view of a modification of the antenna element such as may be employed in association with the mechanism illustrated in Figures 1 and 2;

10 Figure 5 is a side elevation of another form of antenna system;

Figure 6 is a front elevation of the structure shown in Figure 5;

Figure 7 is a vertical section through the antenna operating mechanism of Figure 5;

15 Figure 8 is an enlarged fragmentary plan view, partly in section, of a portion of the structure shown in Figure 7;

Figures 9 and 10 represent side elevational and perspective views, respectively, of another form of antenna element; and

20 Figures 11 and 12 are similar views, respectively, of a modification of the structure shown in Figures 9 and 10.

In order to facilitate an understanding of the invention, reference is made to the embodiment thereof shown in the accompanying drawings and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

25 Figures 1—3 inclusive of the drawings represent an antenna system in which the antenna element is supported for displacement from a raised operative position to a depressed or retracted inoperative position, displacement being effected by simple and compact operating mechanism accessible from the interior of the vehicle.

30 Thus the vehicle top 13 may be apertured adjacent the forward end thereof, and a support or casing 12, preferably of airfoil design, is secured directly to the vehicle top so as to overlie and constitute a closure for the said opening. The antenna element 11, shown as a rod of conducting metal and sufficiently rigid to be self-supporting when mounted at one end only, is bent laterally at that end to provide a supporting shaft portion 15 extending transversely of and into the casing 12. Surrounding the shaft portion 15 of the antenna element is a sleeve 18 of soft rubber, vulcanized or otherwise surface-bonded to the shaft portion. An outer sleeve 19, surrounding the sleeve 18 and bonded thereto, is 35 journaled for rotation in one side of the casing

12. At the opposite side of the casing, the shaft 15 is journaled in a bushing 20 of rubber or other insulating material. A portion of the periphery of the sleeve 19 is serrated, as indicated at 21 (Figure 5), for engagement with a correspondingly shaped aperture in one end of an operating lever 22. The lever is thus mounted on the sleeve 19 and serves to elevate and depress the antenna element 11 in accordance with its movements, the rubber sleeve 18 serving as an insulating element and further affording a resilient connection between the antenna element and the operating lever, so as to yield if the extended antenna element meets with an obstruction. Friction discs 23 and 24 are mounted on sleeve 19 on either side of the lever 22, and a spring washer 25 is disposed between the friction disc 23 and the wall of the casing 12, the discs 23, 24 and washer 25 cooperating to retain the lever 22 in any position in which it is placed.

A conductor 26 (Figure 3) for electrically connecting the antenna element and the receiver (not shown), is connected to the shaft portion 15 of the antenna element 11 by means of a spring clip 27, which engages in a groove 28 formed in the shaft 26.

If desired, a sensitivity switch 29 may be associated with the casing 12 in such a way as to be operated by movement of the lever 22 into and out of its uppermost position, thus providing for adjustment of the sensitivity of the receiver in accordance with the position of the antenna.

The antenna element itself may assume various forms. Thus in Figure 4 is represented an antenna element 10 consisting of a plurality of elongated members 8, connected by webs 9 to form a rigid structure, the members being of airfoil contour. The element 10 may be supported on a housing 12 similar to that described in connection with Figures 1-3 and operable by mechanism illustrated therein.

In the device illustrated in Figures 5-8, inclusive, the antenna comprises two wire rods 30 seated in discs 33, mounted on a shaft 31, which is journaled in a casing 32 of airfoil section. The discs 33 are insulated from shaft 31 by rubber bushings 34, and are connected to the radio receiver by conductors 35, to provide a dual antenna system. The shaft 31 is adapted to be rotated, to elevate and depress the antenna, by means of a crank 36, secured to a shaft 37, journaled in the casing 32. A worm 38 secured on the shaft 37 engages a worm gear 39 on shaft 31, and it is apparent that the antenna may be elevated or depressed by rotating the crank 36 in the proper direction. Preferably the rearward ends of rods 30 are provided with soft rubber knobs 40, to prevent the rods from grounding on the vehicle top.

Figures 9 to 12 show two exemplary forms of antenna designed to reduce wind resistance while providing relatively large surfaces for the interception of radio energy. These forms of antenna

are illustrated as rigidly attached to the vehicle top, although it is obvious that similar forms might be mounted for relative movement as hereinbefore described.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In an antenna system for motor vehicles, the combination with a vehicle body having an opening therein, of a support secured to said body so as to constitute a closure for the opening, an antenna element pivotally mounted on said support for displacement from an inoperative lowered position to an operative raised position, and operating means for so displacing said element, said operating means comprising an arm projecting through said opening for manipulation from the interior of the vehicle and being connected to said element so as to form there-
20 with a bell-crank lever.

2. In an antenna system for motor vehicles, the combination with a vehicle top having an opening therein, of a support secured to said top so as to constitute a closure for the opening, an antenna element sufficiently rigid to be self-supporting, said element being pivotally mounted at one end on said support on an axis extending transversely of the vehicle for displacement from an inoperative lowered position, in which it extends rearwardly from said axis, to an operative raised position, and operating means for so displacing said element, said operating means being secured to said element and projecting through said opening for manipulation from within the vehicle.

3. In an antenna system for motor vehicles, the combination with a vehicle top having an opening therein, of a casing secured to said top so as to constitute a closure for the opening, an antenna element supported by said casing for displacement from an inoperative lowered position to an operative raised position, operating means for so displacing said element, said operating means being carried by said casing and projecting through said opening for manipulation from within the vehicle, and gearing within said casing for connecting said operating means and said antenna element.

4. In an antenna system for motor vehicles, the combination with a vehicle body having an opening therein, of a support secured to said body so as to constitute a closure for the opening, an antenna element mounted on said support for displacement from an inoperative lowered position to an operative raised position, operating means for so displacing said element, said operating means being mounted on said support and projecting through said opening for manipulation from the interior of the vehicle, and resilient means affording a yielding connection between said operating means and said element.

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