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ANTENNA CONSTRUCTION

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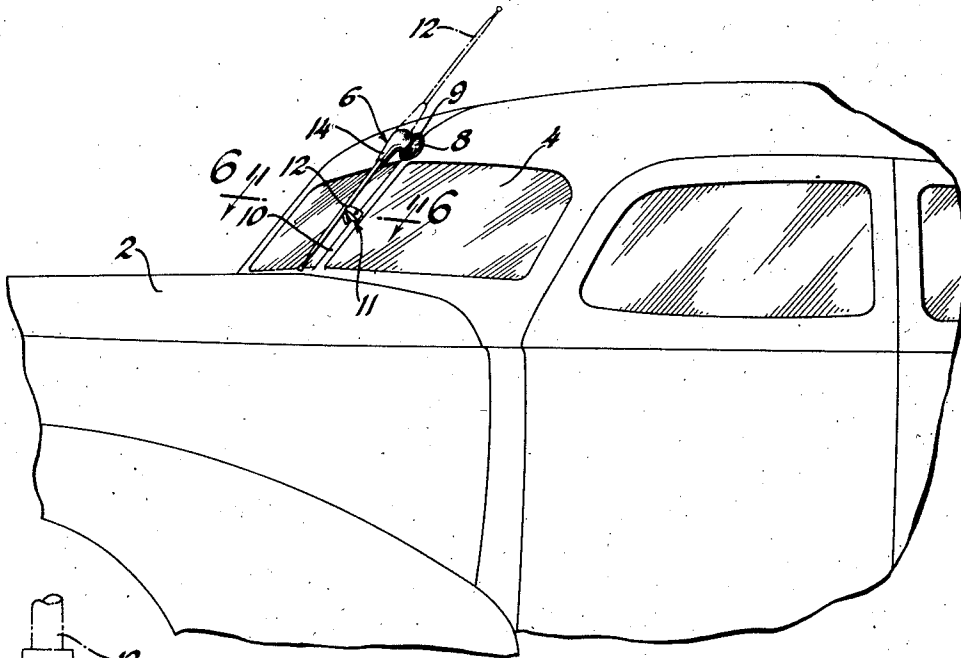


Fig. 1

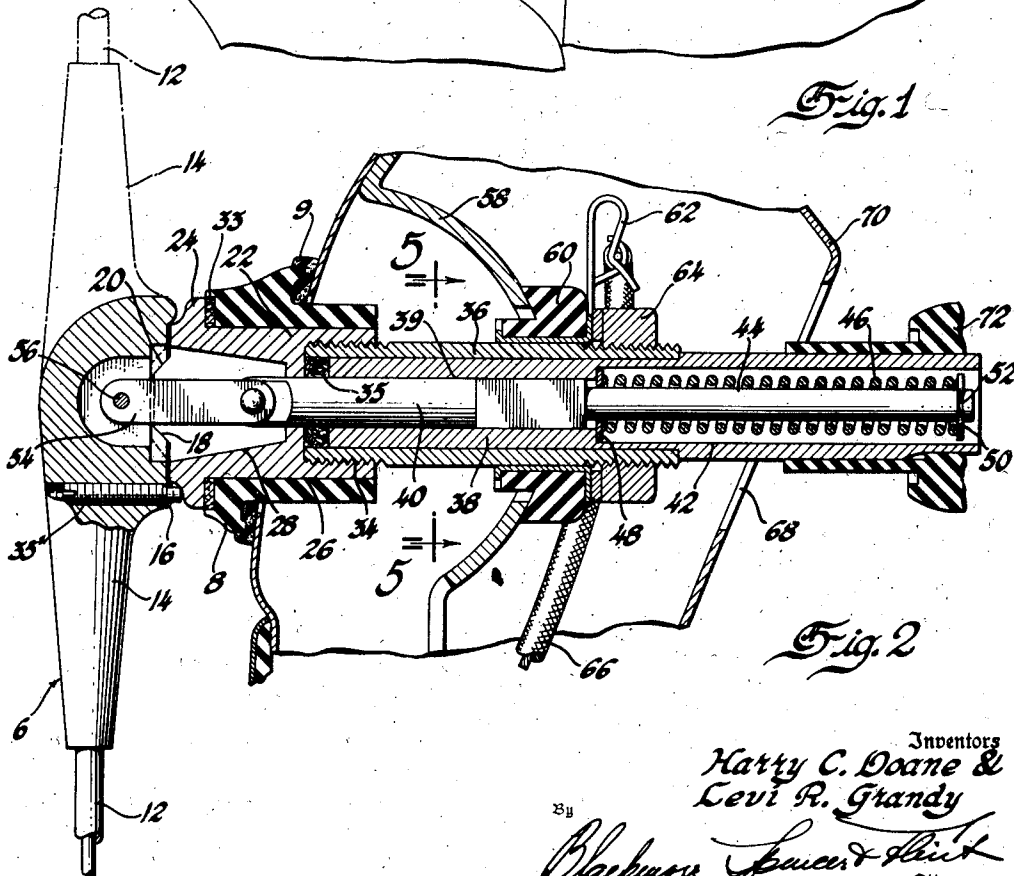


Fig. 2

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## UNITED STATES PATENT OFFICE

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## ANTENNA CONSTRUCTION

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9 Claims. (Cl. 250—33)

This invention relates to antenna devices and more specifically to antennas adapted to be used on mobile vehicles.

With the increased use of radio equipment for receiving sets on automotive vehicles, it has become somewhat of a problem to provide antenna means for the receivers due to the reason that the car is all metal and now of course carries an all-metal or "turret top."

As well as providing the satisfactory electrical characteristics, it is necessary to provide an antenna whose appearance is not objectionable since the cars of the present day are streamlined and any projection or member on the outside of the vehicle tends to detract from the appearance.

It is therefore an object of our invention to provide a satisfactory antenna for an automotive vehicle which may be easily applied to the same and whose appearance is not objectionable.

It is a further object of our invention to provide an antenna whose position may be altered from the interior of the vehicle whereby the antenna may be placed in an inconspicuous location for local reception and may then be moved to a position more receptive to radio waves for long distance reception.

With these and other objects in view, the embodiments of our invention will be best understood from the following description and claims and illustrations in the accompanying drawings, in which:

Figure 1 is a partial perspective view of a car showing our antenna applied thereto;

Figure 2 is an enlarged vertical section through the header of the car showing our antenna;

Figure 3 is an elevation of the base member of the antenna;

Figure 4 is an elevation showing the mating coupling member secured to the header which cooperates with the base antenna member of Figure 3;

Figure 5 is a sectional view taken on line 5—5 of Figure 2;

Figure 6 is an enlarged sectional view taken on line 6—6 of Figure 1;

Figure 7 is an enlarged side elevation of the header with parts being broken away and shown in section.

A car 2 which is, as conventional, supplied with windshields 4, is shown in Figure 1 as having applied thereto the antenna of our invention indicated generally at 6. This antenna is shown as coming through the header in which is supported an insulator 8 which is surrounded by a

circular soft rubber pad 9 between the insulator and the top to seal the opening. The antenna may be turned down parallel to the center strip 10 of the windshield as shown in heavy outline or may be turned 180° about its pivot as shown in dotted outline.

In order to properly support the antenna when it lies in the downward position parallel to the center strip of the windshield, a stop such as indicated generally at 11 is provided. This stop is shown in detail in Figure 6 and consists of two complementary pieces of insulation 13 and 15, each adapted to be rigidly secured to a metal bracket such as 17 and 19. These brackets also each carry a cylindrical member such as 21 and 23 respectively, one of the same being internally threaded. The form of the brackets is similar in shape to the sectional contour of the center strip 25 of the windshield and act as clamps thereon to support the stop. A bolt 27 carried in the cylindrical portions 21 and 23 clamps the two halves together and the assembly to the strip 25. The nose of the stop provides a depression or gully such as 29 into which the antenna falls and is maintained. This antenna is constructed of a small tube and rod assembly 12 which is firmly secured to a roughly conical base member 14 by set screw 31, said base member having one vertical face formed with a circular rim 16 and being hollowed out and formed with a series of tapered sector clutch blocks 18 to engage with a series of mating clutch members 20 provided in a roughly cylindrical bearing member 22. This member 22 carries a collar 24 integral therewith at one end, the remainder fitting within the hollow center 26 of the insulator 8. Between the collar 24 and the end of the bushing 8 is mounted a resilient washer 33 to act as a seal against moisture and if necessary the collar may have a ring, not shown, mounted thereon for wearing purposes.

One end of the member 22 has a frusto-conical bore 28 therein. The opposite end of the member 22 has a cylindrical bore therein which is internally threaded as shown at 34 and has a hollow tubular member 36 screwed therein and within which and concentric therewith is a second and smaller tubular member 38 within the center square opening 39 (shown in Figure 5) on which is supported a rod 40.

Mounted within the end of the tube 36 where it is threaded into the member 22 is a resilient washer 35 adapted to surround the rod 40 and be supported adjacent the end of the inner tubular member 38 to form a moisture proof connec-

tion. This rod extends from the base of the conical member 22 through the tube 36 and into the projecting end of the concentric tubular member 38 which has a larger bore 42 for substantially one-half of its length than the diameter of the rod 40.

The rod 40 has a reduced section within this same enlarged bore as shown at 44 and carries a compression spring 46 concentric therewith which is adapted to bear against a pair of washers 48 and 50, the washer 48 being pressed by the spring against the shoulder formed by the change in bore within the member 38 and the washer 50 being applied to an annular groove 52 in the outer end of the reduced section 44 of the rod 40. It is thus evident that the spring 46 tends to maintain the rod 40 within the member 38 and resists any pull tending to move it to the left as shown in Figure 2.

Pivotally secured to the end of the rod 40 is a link 54, the opposite end of which is also pivotally secured to the base of the member 14 as shown at 56. Thus as pressure is applied to the antenna 12 in any direction the spring 46 may be compressed allowing the link and rod to be withdrawn to the left and the antenna to pivot about some point of contact between the screw 35' and the rim 24 of the two engaging clutch members. The adjustment screw 35' projects through the base 14, its tip engaging the collar 24 so that the angularity of the tube 12 with respect to the assembly may be varied to regulate the position of the tube with respect to the stop. This enables the tube to be adjusted so that it may enter the notch 29 in the stop with ease.

Within the top of the car is provided a brace member 58, more or less of arcuate form, and an insulating block 60 is provided between this brace member 58 and the assembly to support the same. Secured to the block by extending through the central opening therein and having two radially extending flanges is a terminal member 62, the block and terminal assembly fitting over the outer periphery of the tube 36 and being clamped thereon by a suitable nut 64 which presses the assembly against the brace member 58, the terminal member being connected to any conventional lead-in such as 66.

There is applied to the inner end of the member 38 which projects through an opening 68 in the header 70 a knob 72 which is rigidly secured to the member 38 whereby when the knob is rotated the member 38 and its associated parts will be rotated about the axis of the rod 40 and the antenna may be rotated as shown in Figure 1. If at any time the antenna strikes an object when it is in its uppermost position, such as a limb of a tree 74 as shown in Figure 7, there is a certain amount of resiliency in the rod itself and plus the possibility of compressing the spring 46 the antenna may lie back in the dotted line position as shown in Figure 7, pivoting around a point such as 76, pulling the rod and link combination outwardly and passing underneath the obstruction rather than causing the antenna to break off or bend the tube permanently regardless of the direction of movement of the car. In this construction it will be seen that we have provided an antenna accessible for operation from the interior of the car and one in which resiliency or give is supplied so that the antenna will not be broken or bent by having it hit different obstructions whether the car is moved forward or backward, but will be able to move to

one side and pass the obstruction. If only local reception is desired, the rod 12 may be parallel to the windshield strip 10 and is hardly noticeable, but if longer distance reception is desired it is then rotated to its upright position from the car interior with ease. Efficiency may be further increased by pulling out telescopic section or sections.

We claim:

1. In antenna construction, a wall, a rotatable member trunnioned in the wall, a spring biased reciprocable member carried by the rotatable member, an antenna member pivotally secured to the reciprocable member adjacent the end of the rotatable member whereby the antenna member is urged against the end of the rotatable member and will rotate therewith but may be moved with respect thereto.

2. In antenna construction, hollow rotatable means, clutch means on one end of the hollow means, antenna means, complementary clutch means on one face of the antenna means and resilient transversely pivotal connecting means between the rotatable means and the antenna means biasing one toward the other to hold the clutch means in juxtaposition so that the two can rotate together but also have relative motion.

3. In antenna construction, a wall, hollow means rotatably supported through the wall, a reciprocable rod within the hollow means, spring means connected to the rod to bias it in one direction, antenna means connected to one end of the rod, clutch means on one end of the hollow means, complementary clutch means on the antenna means whereby the spring biased rod maintains the clutch means in engagement but allows relative motion of the parts and the two normally rotate together.

4. In antenna construction, a stationary wall, a rotatable member trunnioned in the wall, a reciprocable member carried by the rotatable member, resilient means to bias the reciprocable member, an antenna secured to one end of the reciprocable member to force the antenna against one end of the rotatable member, clutch means on the two engaging faces of the antenna means and rotatable means whereby the two normally rotate together but can be moved relatively to each other.

5. In antenna construction for a motor vehicle having a body, a header in said body, a plurality of spaced insulating means carried in the header, means rotatably carried in the insulating means extending from the interior to the exterior of the body, said rotatable means being hollow, a rod carried in the hollow portion of the rotatable means, helical spring means mounted about one end of the rod to bias it in one direction, an antenna rod, a base secured to the rod, means pivotally connecting the base to the reciprocable rod and complementary clutch means on the base and end of the hollow rotatable means whereby the spring biased rod maintains the clutch normally in engagement and the rotatable means and antenna rotate together.

6. In antenna construction for a motor vehicle having a body, a header in said body, a plurality of spaced insulating means carried in the header, means rotatably carried in the insulating means extending from the interior to the exterior of the body, said rotatable means being hollow, a rod carried in the hollow portion of the rotatable means, helical spring means mounted about one end of the rod to bias it in one direction, an an-

tenna rod, a base secured to the rod, means pivotally connecting the base to the reciprocable rod, complementary clutch means on the base and end of the hollow rotatable means whereby the spring biased rod maintains the clutch normally in engagement and the rotatable means and antenna rotate together, and means secured to the inner end of the rotatable means for turning the same from the interior of the body which causes rotation of the antenna means on the exterior of the body.

7. In antenna construction for a motor vehicle having a body, a header in said body, a plurality of spaced insulating means carried in the header, means rotatably carried in the insulating means extending from the interior to the exterior of the body, said rotatable means being hollow, a rod carried in the hollow portion of the rotatable means, helical spring means mounted about one end of the rod to bias it in one direction, an antenna rod, a base secured to the rod, means pivotally connecting the base to the reciprocable rod, complementary clutch means on the base and end of the hollow rotatable means whereby the spring biased rod maintains the clutch normally in engagement and the rotatable means and antenna rotate together, said reciprocable rod allowing the clutch members to be separated or one portion pivoted on another portion of the clutch and the antenna may be moved to different relative positions with respect to the rotatable means to avoid breakage if the antenna encounters an obstruction.

8. In antenna construction, a wall, a rotatable

member trunnioned in the wall, an antenna member resiliently connected to the projecting end of the rotatable member and roughly at right angles thereto, adjustable means carried by the antenna member engaging the projecting end of the rotatable member to vary the angular position of the two and a stop mounted on the wall and against which the projecting antenna member is adapted to engage whereby the antenna member may be rotated about the axis of the rotatable member and may engage the stop at a given position of rest and its angularity or position against the rest may be varied by the adjustable means.

9. In antenna construction, a wall, a rotatable member trunnioned in the wall and having at least a portion of the projecting surface thereof substantially spherical, an antenna member resiliently connected to the projecting end of the rotatable member and roughly at right angles thereto, adjustable means carried by the antenna member engaging the spherical surface of the projecting rotatable member to vary the angular position of the two and a stop mounted on the wall and against which the projecting antenna member is adapted to engage whereby the antenna member may be rotated about the axis of the rotatable member and may engage the stop at a given position of rest and its angularity or position against the rest may be varied by the adjustable means.

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