Jan. 2. 1945. W. VAN BENSCHOTEN 2,366,299

RADIO ANTENNA

Filed Aug. 17, 1939

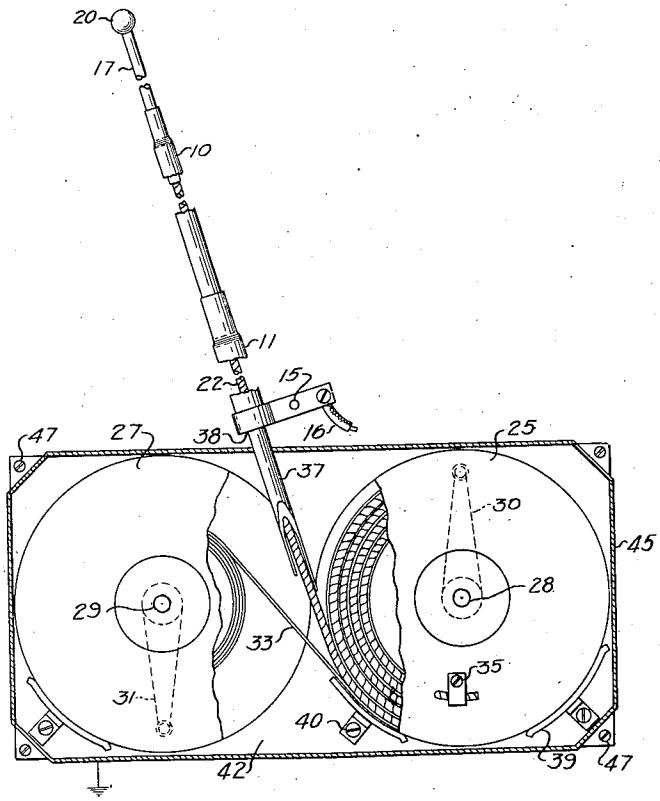


Fig. 2

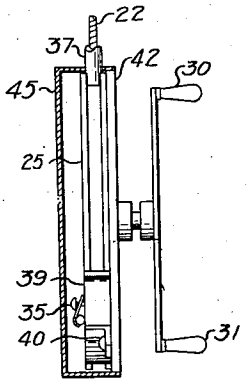


Fig. 3

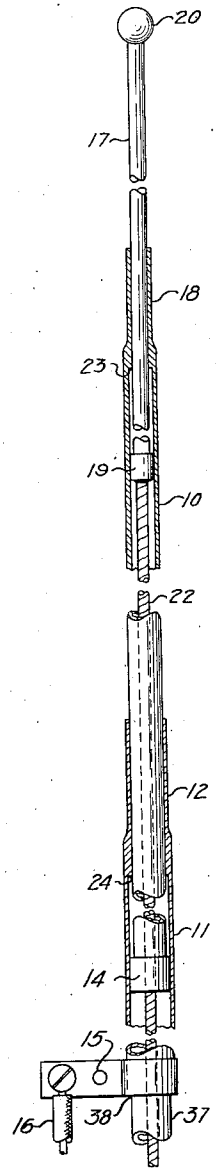


Fig. 1

INVENTOR.
WALTER VANBENSCHOTEN

BY Horace B. Fay

ATTORNEY.

Patented Jan. 2, 1945

2,366,299

UNITED STATES PATENT OFFICE

2,366,299

RADIO ANTENNA

Walter Van Benschoten, Cleveland, Ohio, assignor to The Radiart Corporation, Cleveland, Ohio, a corporation of Ohio

Application August 17, 1939, Serial No. 290,639

8 Claims. (Cl. 250—33)

This invention relates to a radio antenna of the extensible type for use in motor vehicles and the like and is particularly directed to an antenna which may be extended from within the vehicle.

In the past, vehicle antennae have been subject to the disadvantages that it was normally necessary to be on the outside of the vehicle to either extend or collapse the antenna. In inclement weather this was undesirable and in any event was an inconvenience. Antennae have been made in the form of bars which are extensible from within the body of the vehicle by a straight line movement, but these are open to the objection that they require more space than is ordinarily available for such installations.

The general object of my invention has been to provide an antenna which is extended and collapsed by rotation of a reel about which one of the antenna members is wrapped. Other objects of the invention will become apparent from the following specification and the drawing.

To the accomplishment of the foregoing and related ends said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawing and the following description setting forth in detail certain structure embodying the invention, such disclosure constituting, however, but one of various forms in which the principle of the invention may be used.

In said annexed drawing—

Fig. 1 is a longitudinal section of the telescoping aerial assembly;

Fig. 2 is a side elevation partially in section of one form of my improved antenna; and

Fig. 3 is an end view of the mechanism shown in Fig. 2.

My improved antenna is adapted for a variety of uses and may, for instance, be installed in the body pillars of a vehicle such that it is almost completely invisible and in its collapsed position is enclosed by the pillar. The antenna may also be mounted in the cowl or, if desired, at the side of the body.

Referring now to Fig. 1, my invention includes the usual telescoping aerial consisting of a pair of sleeves 10 and 11, the former of which is slidably received in the latter in the usual manner. The sleeve 10 is prevented from rattling in the sleeve 11 by the fit between the necked in portion 12 and the sleeve 10 and by a resilient member 14 carried by the end of the sleeve 10 and normally tending to spread to exert a clamping action on the side walls of the sleeve 11.

The sleeve 11 is fixedly clamped to the vehicle body as at 15; which clamp is insulated from the body to prevent grounding of the incoming signals. A lead in 16 is also provided through which the signals are transmitted to the set.

The top rod-like member of the antenna, consisting of a resilient stainless spring wire 17, is slidably received by the necked in end 18 of the sleeve 10. It is prevented from rattling against the sleeve by a resilient spring-like member 19 similar to the member 14 heretofore described. The rod 17 is capped by a ball 20.

To extend and collapse the antenna a flexible cable 22, preferably a Bowden wire, is secured as by soldering to the inner end of the rod 17 and is also wrapped around a reel hereafter described. Since the cable is enclosed for its entire length it is prevented from excessive bending as the reel is unwound and the cable thus pushes on the rod 17, causing the aerial to extend.

After the rod is extended far enough to enable the member 19 to engage a shoulder 23 of the sleeve 10, further turning of the reel will continue to extend the rod and also withdraw sleeve 10 from the sleeve 12. This extension will continue until a shoulder 24 is engaged by the member 14 of the sleeve 10. When the reel is turned in the reverse direction the rod 17 is retracted until the ball 20 engages the top of the sleeve 10 and pulls it down into the sleeve 11, collapsing the antenna.

It will be apparent that more than one extensible sleeve 10 may be employed, such other sleeves being inserted between the stationary sleeve 11 and the rod 17.

The diameter of the rod 17 normally exceeds the diameter of the cable 22. This is necessary to provide a rod of sufficient rigidity to be resistant to bending in the wind and to be durable enough to stand the hard usage to which an antenna is subjected, if, for instance, the vehicle is driven under a low roof while the antenna is extended. The decreased thickness of the member 22 is desirable because of the reduced cost and the smaller space required for the reel on which it is wound.

One form of reel construction is shown in Fig. 2, in which a pair of reels 25 and 27 are provided formed of a molded plastic insulating material, rotatably mounted at 28 and 29 and each provided with a hand crank 30 and 31. The reels are of such a width that successive coils on the member 22 will pile on top of each other, as indicated in Fig. 2, and will not lie side by side. Interposed between each coil of the Bowden wire is

a flexible copper ribbon or tape 33 which is fastened at one end to the reel 27 and may be wrapped therearound by the handle 31. The wire 22 in turn is clamped to the reel 25 at 35.

A metallic conducting sheath 37 terminates adjacent the lower end of the sleeve 11 and is insulated therefrom as at 38, and provides a relatively close fit for the wire 22 from the antenna connection to a region closely adjacent the point at which the wire leaves the reel 25. An inner insulating sheath is interposed between the wire and sheath 37 to prevent electrical contact therebetween.

All parts of the antenna, including the wire 22, the sleeves 10 and 11, and the rod 22 are electrically insulated from the car body to prevent any grounding.

To extend the antenna the handle 31 is turned in a direction to wind the ribbon 33 onto the reel 27. This pulls the wire 22 off of the reel 25 and forces it through the sheath 37 to extend the rod 17 and the rest of the antenna. It will be noted that as the wire 22 is stripped from the reel with a pulling action there is no possibility of binding between the wire and the other parts of the mechanism with a consequent jamming of the parts. Thus the antenna may always be extended by a uniform pull on the crank 31 without the necessity of forcing it past any bumps or jamming which could take place with other constructions.

To collapse the antenna the handle 30 is turned, thus wrapping the wire 22 and the tape 33 about the reel 25 until the antenna ball 20 has completely collapsed the sleeve 10.

To insure that the tape and the wire will be guided properly, a plurality of guides 39 are supplied, each bolted at 40 to the supporting plate 42 for the unit. These are fixedly carried by the frame, but if desired rollers may be substituted which rotate on contact with the moving parts coiled on the reel.

From the foregoing description it will be seen that as the handle 31 is rotated the tape 33 is pulled off of the reel 25, causing it to unwind and force the wire 22 up through the antenna structure. This in turn pushes the antenna rod up and extends the aerial. On the other hand, as the handle 30 is rotated the wire 22 and the tape 33 are both coiled about the reel 25, thus retracting the antenna.

It is necessary, as indicated above, to completely insulate from the vehicle body all parts of the antenna assembly which conduct the incoming signals in order that there may be no grounding of the same. Further, it is highly desirable to shield all signal conducting parts of the antenna assembly which lie within the confines of the body in order that no ignition noises and the like may be picked up by these parts and transmitted to the set. For this reason the sheath 37, which is insulated from the wire 22 is grounded as indicated in Fig. 2.

The reels 25 and 27, although themselves non-conducting, carry the wire 22 and the ribbon 33 which are in contact with the antenna portion and in a sense are a part of it. Also, the guides 39, whether as shown or made of rollers, are preferably metallic and contact the coiled wires. For this reason an enclosure or box 45 of good current-conducting material is provided which entirely surrounds the reels and is open only to permit passage of the sheath 37 and the handles therethrough. This box in turn is grounded, thus completely shielding the parts within it. The plate 42 is rigidly secured to the box and may in fact form one face thereof. The box or enclosure in turn is bolted as at 47 and this in turn effects the grounding of the enclosure.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In an extensible antenna assembly adapted to be mounted on a motor vehicle, a tubular member adapted to be mounted fixedly with respect to said body and electrically insulated therefrom, an extensible antenna rod slidable within said member to be extended and retracted with respect to said member, a reel formed of insulating material and mounted for rotation adjacent said member, a flexible connecting member coiled about said reel and passing within said tubular member and secured to said rod, a current conducting sheath surrounding said connecting member between said reel and said tubular member and insulated from said rod, a current conducting enclosure substantially surrounding said reel and a ground connection from said enclosure to the vehicle body.

2. In an extensible antenna assembly adapted to be mounted on a motor vehicle, a tubular member adapted to be mounted fixedly with respect to said body and electrically insulated therefrom, an extensible antenna rod slidable within said member to be extended and retracted with respect to said member, a reel formed of insulating material and mounted for rotation adjacent said member, a flexible connecting member coiled about said reel and passing within said tubular member and secured to said rod, and means to pull said connecting member from said reel to thereby extend said rod.

3. In an extensible antenna assembly adapted to be mounted on a motor vehicle, a tubular member adapted to be mounted fixedly with respect to said body and electrically insulated therefrom, an extensible antenna rod slidable within said member to be extended and retracted with respect to said member, a reel formed of insulating material and mounted for rotation adjacent said member, a flexible connecting member coiled about said reel and passing within said tubular member and secured to said rod, means to pull said connecting member from said reel to thereby extend said rod and means to pull on said connecting member to withdraw it from within said tubular member and retract said rod.

4. In an extensible antenna assembly adapted to be mounted on a motor vehicle, a tubular member adapted to be mounted fixedly with respect to said body and electrically insulated therefrom, an extensible antenna rod slidable within said member to be extended and retracted with respect to said member, a reel formed of insulating material and mounted for rotation adjacent said member, a flexible connecting member coiled about said reel and passing within said tubular member and secured to said rod, and means to guide said connecting member as it is removed from said reel to prevent binding of said connecting member and consequent locking of said reel, said means comprising a ribbon which is disposed in contact with said member.

5. In an extensible antenna assembly adapted to be mounted on a motor vehicle, a tubular

member adapted to be mounted fixedly with respect to said body and electrically insulated therefrom, an extensible antenna rod slidable within said member to be extended and retracted with respect to said member, a reel formed of insulating material and mounted for rotation adjacent said member, a flexible connecting member coiled about said reel and passing within said tubular member and secured to said rod and flexible means movable with said connecting member to guide said connecting member as it is removed from said reel to prevent binding of said connecting member and consequent locking of said reel.

6. In an extensible antenna adapted to be mounted on a motor vehicle, a support to fasten said antenna to said body, an extensible antenna rod carried by said support and adapted to be extended and retracted, a reel mounted adjacent said support, a flexible member connected to said rod and coiled about said reel to extend and retract said rod upon turning said reel, a second member interposed between the convolutions of said first member when coiled about said reel and means to pull on said second member to thereby uncoil said first member.

7. In an extensible antenna assembly adapted to be mounted on a motor vehicle, a tubular member adapted to be mounted fixedly with respect to said vehicle and electrically insulated therefrom, an extensible antenna rod slidable within said member and adapted to be extended and retracted with respect to said member, a reel mounted for rotation adjacent said member, a flexible connecting member coiled about said reel and secured to said rod, a second reel mounted for rotation adjacent said first reel, and a tape coiled about said second reel and having portions thereof interposed between the convolutions of said connecting member, said tape functioning to guide said connecting member as it is removed from said first-named reel to prevent binding of said connecting member and consequent locking of said reel.

8. In an extensible antenna assembly adapted to be mounted on a motor vehicle, an extensible radio signalling member mounted on said vehicle for extension and retraction with respect thereto, a flexible actuating member secured to said extensible member, a reel adapted to receive said flexible member and by its rotation in one direction cause said flexible member to retract said extensible member, a second reel, a second flexible member secured to said second reel and having portions thereof disposed between the convolutions of said first flexible member on said first reel, and means for rotating said second reel to thereby coil said second flexible member thereabout, rotate said first reel, uncoil said first flexible member and extend said signalling member; said second flexible member functioning at the same time to guide said first flexible member as it is uncoiled, to prevent binding of the latter and to prevent locking of said first-named reel.

WALTER VAN BENSCHOTEN.