

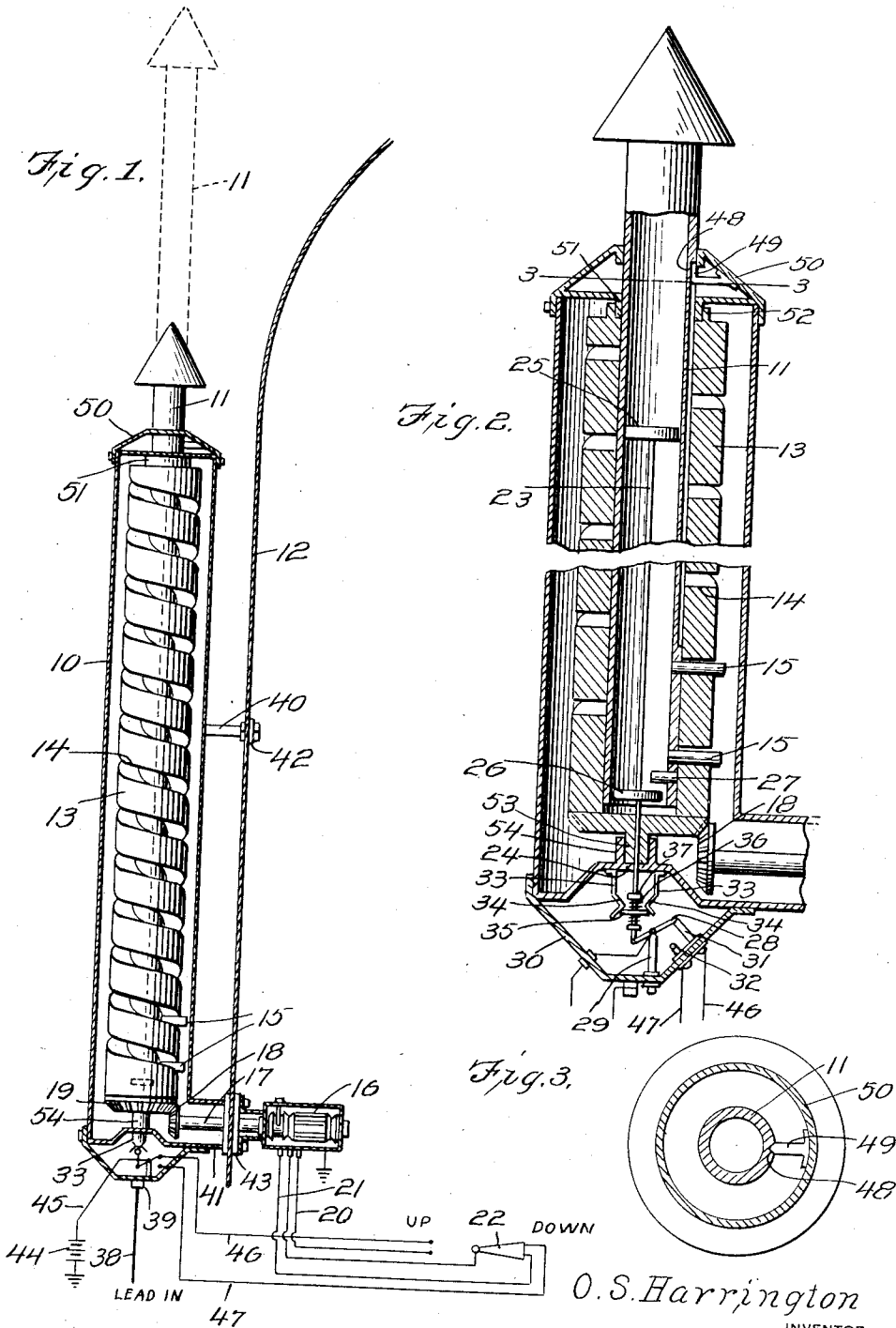
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CAR AERIAL

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CAR AERIAL

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3 Claims. (Cl. 250—33)

This invention relates to car aerials and has for an object to provide an aerial which may be installed at any convenient place on the car and which will be extended to operative position when the car radio switch is turned to circuit closing position and which will be retracted to release position to be inconspicuous when the car radio switch is opened.

A further object is to provide a device of this character which will be formed of a few strong simple and durable parts, which will be inexpensive to manufacture and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming part of this specification,

Figure 1 is a longitudinal sectional view of a car aerial constructed in accordance with a car aerial and shown in retracted position.

Figure 2 is a view similar to Figure 1 but drawn to enlarged scale.

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates a tubular housing having slidably mounted therein a tubular aerial member 11 adapted to be projected from the housing and extend into the air above or adjacent to a motor vehicle 12.

The aerial member is projected and retracted through the medium of a rotatable, vertically arranged worm 13 which is sleeved on the aerial member 11 and is provided with a longitudinal spiral slot 14 the convolutions of which are suitably spaced apart to receive a pair of pins 15 which extend laterally from the aerial member 11.

For causing rotation of the worm there is provided a reversible motor 16, operated by the motor vehicle battery and having its shaft 17 arranged horizontally and provided at the end with a bevel gear 18 which meshes with a bevel gear 19 fixed to the lower end of the worm. The reversing circuit wires 20 and 21 are so connected to the car radio switch 22 that when the switch is turned to "on" position the motor is started and the worm is rotated to elevate the aerial member 11 through the medium of the pins 15. When the pins arrive

at their upper limit of movement the motor circuit is broken as will now be described.

A switch rod 23 is mounted to slide vertically in a bearing 24 which forms the bottom of the housing 10. The switch rod is provided with spaced stop collars 25 and 26. A pin 27 projects inwardly from the aerial member 11 between these stop collars. The pin is located near the bottom of the aerial member 11 and is carried upwardly by the aerial member when the latter is extended, striking against the upper stop collar 25 and lifting the switch rod 23 to open a snap switch about to be described, in the motor circuit and stop rotation of the motor.

The snap switch comprises a switch arm 28 which is pivotally mounted intermediate its ends on a tender 29 which rises from a switch housing 30 disposed below the bearing 24. The switch arm is pivotally connected at one end to the lower end of the switch rod 23. The free end of the switch arm is adapted to engage alternately a pair of stationary switch contacts 31 and 32 which are carried by the switch housing, when the switch arm 28 is swung to either of its circuit closing positions. A pair of spring tongues 33 are secured to the bearing 24 and are provided with V-shaped free ends 34.

A collar 35 is slidably mounted on the switch rod 23 and is yieldably held by helical springs 36 which bear against stop collars 37 on the rod.

When the pin 27 of the aerial member 11 engages the upper stop collar 25 of the switch rod the latter will be moved upwardly and will swing the switch arm 28 from the contact 31 and onto the contact 32 thus opening the motor circuit at this point at the contact 31 and closing the motor circuit at the contact 32 for the next reversing operation. When the switch rod is thus raised the collar 35 will be moved upwardly past the V-shaped free ends 34 and lodged thereabove with a spring action.

When the radio switch is turned to open circuit the motor will be energized and reversed to rotate the worm 13 in a retrograde direction and carry the pins 15 downwardly thereby lowering or retracting the aerial member 11. At the same time the switch rod 23 will be pushed downwardly when the pin 27 of the aerial member engages the lower stop collar 26 and will rock the switch arm 28 from the contact 32 thereby opening the motor circuit and will engage the switch arm 28 with the contact 31 thereby closing the motor circuit at this point for the next elevating operation. Meanwhile the collar 35 has been moved down-

wardly past the V-shaped extremities 34 with a snap action, ready for the next operation.

The aerial lead-in wire 38 is connected to a binding post 39 secured to the switch housing 30, it being understood that the switch housing 30, housing 10, and aerial member 11 are all formed of metal and that the switch contacts and electrical conductors are thoroughly insulated therefrom in any preferred manner. Also the housing 10 of the aerial is secured to the vehicle 12 by an upper bracket arm 40 and a lower tubular bracket arm 41 through which latter the motor shaft is engaged, both brackets being thoroughly insulated from the vehicle body through the medium of respective insulating bushings 42 and 43.

The wiring diagram shown in Figure 3 is conventional and in this diagram one side of the battery 44 is shown as being connected by a conductor wire 45 to the pivoted switch arm 28. A conductor wire 46 connects the contact 31 with one of the switch contacts of the car radio switch 22 which completes the circuit through the wire 23 for rotating the motor in one direction when the switch is turned to start the radio. A conductor wire 47 connects the contact 32 with one of the switch contacts of the radio switch 22 which completes the circuit through the wire 21 to reverse the direction of the rotation of the motor when the switch 22 is turned to shut off the radio.

For directing the sliding movement upwardly and downwardly of the antenna member 11 a longitudinal guide slot 48 is formed in the member and a guide pin 49 projects into this slot. The guide pin is carried by a cap 50 which closes the upper end of the cylindrical housing 10 and which retains in place a bearing 51 for the upper end of the antenna aerial member 11. A hollow stub shaft 52 projects from the upper end of the worm 13 and is sleeved upon the bearing to rotatably mount the worm at the upper end. The worm is provided with a stub shaft 53 at the lower end which is rotatably received in a bearing 54 formed integral with the bearing plate 22 heretofore described to rotatably mount the worm at the bottom.

Since the operation of the parts has been described as the description of the parts progressed it is thought that the invention will be fully understood without further explanation.

What is claimed is:

1. Radio receiving apparatus for motor vehicles, comprising the combination with a receiving set having a control switch, of a tubular housing adapted to be secured to a motor vehicle, an aerial member slidably mounted in the housing and adapted to be projected from the housing, a worm sleeved on the aerial member, a pin projecting from the aerial member and engaging the worm for moving the aerial member in a rectilinear direction when the worm is rotated, a reversing motor geared to the worm to extend the aerial member when rotating in one direction and to retract the aerial member when rotating in the opposite direction, a source of current respective circuits for reversing the field of the motor connected to said source of current and connected to the radio control switch to be controlled by said switch, turning the radio switch to "on" position, starting the motor for elevating

the aerial, and turning the radio switch to "off" position reversing the motor to lower the aerial, a limit switch having two operative positions connected in said motor circuits, on the opposite side of the motor from the current source, and means carried by the aerial and engaging the limit switch to move the limit switch to one position to close one of the motor circuits when the aerial is elevated and to move the limit switch to its other position to close the other motor circuit when the aerial is lowered.

2. Radio receiving apparatus for motor vehicles, comprising a tubular housing adapted to be secured to a motor vehicle, an aerial member slidably mounted in the housing and adapted to be projected from the housing and extend into the air above or adjacent to the vehicle body, a worm sleeve sleeved on the aerial member, a pin projecting from the aerial member and engaging the worm for moving the aerial member in a rectilinear direction when the worm is rotated, a reversing motor geared to the worm, a source of current supply, respective circuits for reversing the field of the motor connected to said source of current supply a switch controlling the circuits, said switch being located between the source of current supply and the motor, a limit switch having two operative positions connected in said motor circuits on the opposite side of the motor from the current source, and means carried by the aerial member and engaging the limit switch to move the limit switch to one position to close one of the motor circuits when the aerial member is elevated and to move the limit switch to its other position to close the other motor circuit when the aerial member is lowered.

3. Radio receiving apparatus for motor vehicles, comprising a tubular housing adapted to be secured to the vehicle body, a tubular aerial member therein adapted to be projected from the housing, a worm sleeved on the aerial member, a pin projecting from the aerial member and engaging the worm for moving the aerial member in a rectilinear direction when the worm is rotated in either direction, a reversing motor geared to the worm for actuating the worm, a source of current supply, respective circuits for rotating the motor in opposite directions connected to said source of current supply, a switch controlling said circuit, a switch rod slidably mounted in said aerial member and having spaced collars therein, a pin projecting from said aerial member between said collars and adapted to engage one of the collars when the aerial is at its upper limit of movement and adapted to engage the other collar when the aerial member is at its lower limit of movement, said pin when in engagement with either of said collars being adapted to move said switch rod, and a limit switch connected to said switch rod and having two operative positions, said limit switch being connected in said motor circuit, said pin when in engagement with one of said collars moving the switch rod to move the limit switch to one position and close one circuit of the motor when the aerial member is elevated and when in engagement with the other collar moving the switch rod to move the limit switch to its other position to close the other circuit of the motor when the aerial is lowered.

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