Aug. 13, 1957 I. H. BOUCHARD 2,803,011

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Filed June 22, 1956 3 Sheets-Sheet 1

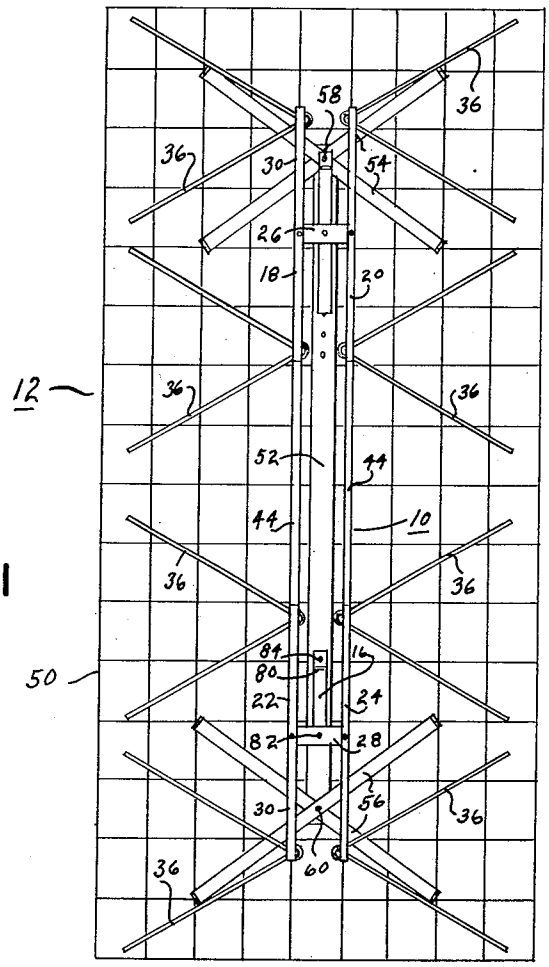

FIG. 1

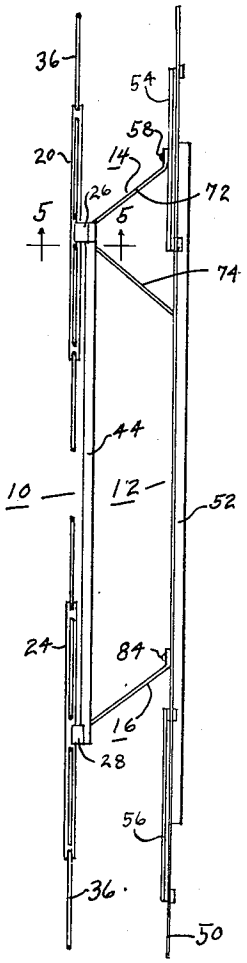

FIG. 2

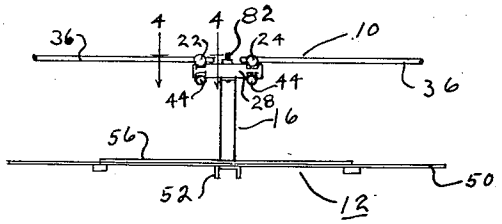

FIG. 3

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Aug. 13, 1957 I. H. BOUCHARD 2,803,011

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Filed June 22, 1956 3 Sheets-Sheet 2

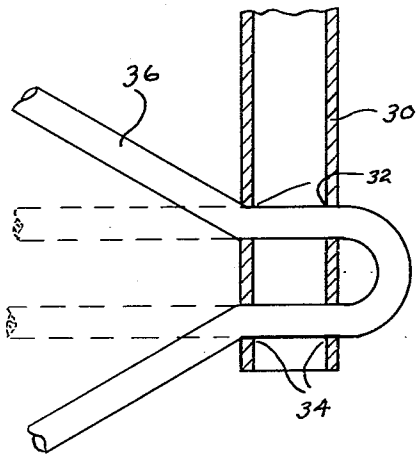

FIG. 4

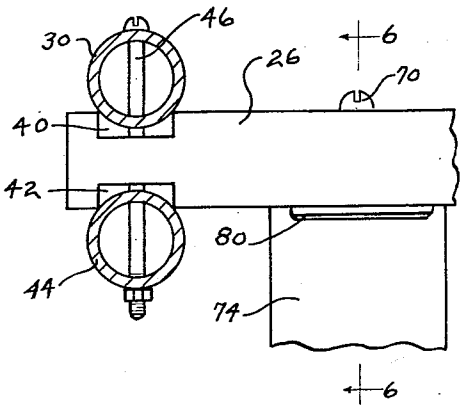

FIG. 5

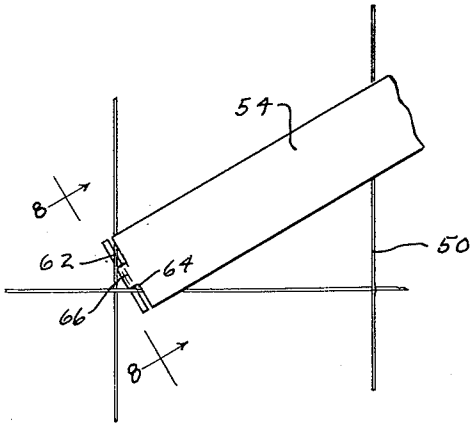

FIG. 7

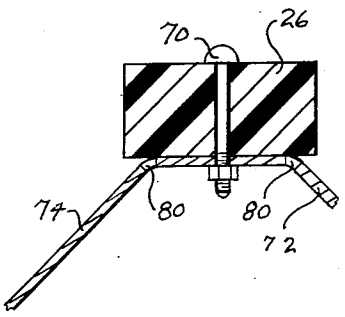

FIG. 6

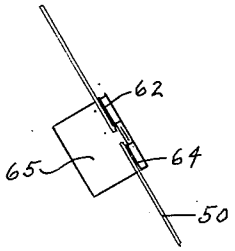

FIG. 8

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Aug. 13, 1957 I. H. BOUCHARD 2,803,011

ANTENNA

Filed June 22, 1956 3 Sheets-Sheet 3

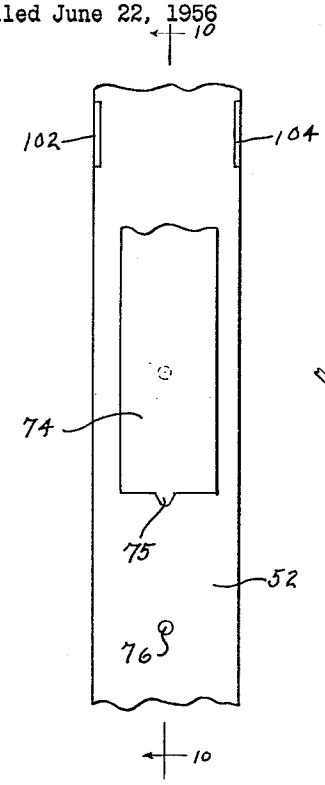


FIG. 9

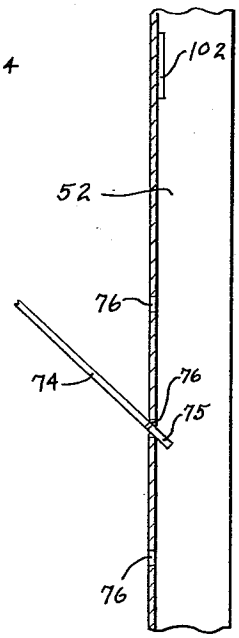


FIG. 10

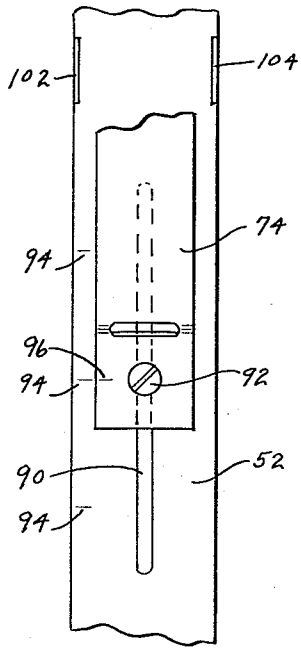
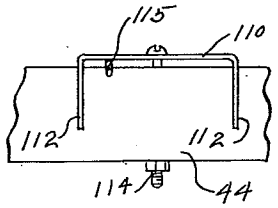


FIG. 11



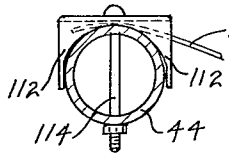


FIG. 12

FIG. 13

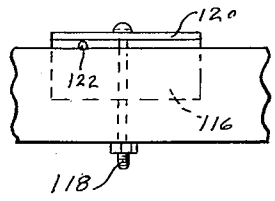


FIG. 14

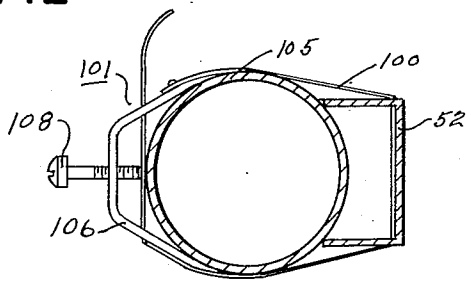


FIG. 15

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2,803,011

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Application June 22, 1956, Serial No. 593,247

12 Claims. (Cl. 343—818)

The present invention relates to antennas and more particularly to antennas of the type used with television receivers.

One of the principal objects of the present invention is to provide a television antenna which can readily be fabricated, packaged, shipped and thereafter installed with a minimum amount of time and effort and without employing any special tools or skills.

Another object of the invention is to provide a television receiver antenna of a simplified and sturdy construction composed of a number of duplicate, interchangeable subassemblies.

Still another object of the invention is to provide an antenna which is preassembled in a collapsed condition for convenience and economy in handling and shipping and which can readily be adjusted into its operating position at the place of installation.

A further object of the invention is to provide an antenna of the aforesaid type in which the driven elements and the reflector can be adjusted relative to one another at the place of installation to any one of several television channels.

Another object is to provide an antenna for television receivers, which is mounted on a mast using conventional stand-off fixtures and to which the lead can easily and securely be attached with a minimum amount of time and work on the part of the service man.

Additional objects and advantages will become apparent from the following description and accompanying drawings, wherein:

Figure 1 is a front elevational view of a television antenna embodying my invention;

Figure 2 is a side elevational view of the antenna shown in Figure 1;

Figure 3 is a bottom view of the antenna shown in Figure 1;

Figure 4 is an enlarged cross sectional view of a portion of my antenna taken on line 4—4 of Figure 3;

Figure 5 is an enlarged cross sectional view of another portion of the antenna taken on line 5—5 of Figure 2;

Figure 6 is a cross sectional view of a portion of the antenna taken on line 6—6 of Figure 5;

Figure 7 is an enlarged fragmentary view of the construction for retaining the reflector portion of the antenna in place;

Figure 8 is a partial cross sectional view of the detail shown in Figure 7 taken on line 8—8 of said figure;

Figure 9 is an enlarged detail view of the structure for adjusting the driven elements relative to the reflector;

Figure 10 is a cross sectional view of the structure shown in Figure 9 taken on line 10—10 of said figure;

Figure 11 is an enlarged view of a modified form of the structure for adjusting the driven elements relative to the reflector;

Figures 12 and 13 are side and end elevational views of my lead connector;

Figure 14 is a plan view of a modified form of my lead connector; and

Figure 15 is a cross sectional view through a portion of my antenna and a mast to which the antenna is secured by conventional stand-off fixtures.

Referring more specifically to the drawings Figures 1 through 3 show an assembled television receiver antenna in position ready for mounting on a mast, consisting of front assembly or driven element **10**, rear or reflector assembly **12** and connecting supports **14** and **16** for holding said assemblies in a predetermined spaced relation. The antenna shown is adapted for all U. H. F. channel reception but can be adjusted to obtain optimum reception of any selected channel. The front assembly consists of a plurality of subassemblies **18**, **20**, **22** and **24** mounted on insulating members **26** for subassemblies **18** and **20** and member **28** for subassemblies **22** and **24**. While eight subassemblies are used in the antenna shown a greater or lesser number may be used to suit requirements, as for example the combination of subassemblies **22** and **24** may be omitted or additional combinations of subassemblies may be employed.

Subassemblies **18**, **20**, **22** and **24** are identical in construction and interchangeable and consist of a tube or bar **30** having two closely spaced holes **32** and **34** near each end for receiving dipole or whisker elements **36**. Both tube **30** and elements **36** are preferably constructed of aluminum although other metal may be used if desired. In assembling element **36** in holes **32** and **34** the element is first formed into a U-shape, the curvature of which has the same diamter as the distance between said holes, and the ends of the element are then slipped through the holes until the tube is seated firmly against the curved portion of the U section. While the element is held firmly in the holes the two prongs of the element are bent away from one another to the position shown in Figures 1 and 4, thereby locking the element securely in place in holes **32** and **34** and forming a good electrical contact between the element and tube **30**. This construction in addition to its ease of fabrication is particularly sturdy and is unaffected by the corrosion normally taking place during extended use of the antenna and also has the further advantage of having only metals of similar composition in contact with one another thus reducing to a minimum electrolytic corrosion between the two parts and thereby increasing the effective life of the antenna. Further a good electrical contact is always maintained between the element and tube despite the usual accumulation of dirt and corrosion, since the vibration of the element prongs by the wind causes said prongs to constantly rub against the metal of the tube around the two holes, thus providing continual metal-to-metal contact between the element and tube.

Members **26** and **28** are preferably constructed of Bakelite, hard rubber, stiff plastic or the like and are provided with two transverse grooves **40** on one side near the ends thereof for receiving bar **30** of the subassembly and with two transverse grooves **42** on the other side for receiving the ends of connecting bars **44**. Bars **30** and **44** are electrically connected and held rigidly in their respective grooves by a bolt **46** extending through said bars and members **26** and **28** at the bottom of the grooves therein. When the nut on the bolt is tightened the bars are pulled firmly against the sides of the grooves which align the two bars with one another and with the corresponding subassemlies of the other subassembly combinations of the antenna.

The rear assembly **12** consists of an open and coarse mesh screen **50** of welded or soldered wire construction mounted on vertical support **52** held rigidly in place by two pairs of cross members **54** and **56** connected to the upper and lower ends of support **52**, respectively, by bolts

or rivets **58** and **60**. Small aligned transverse slots **62** and **64** (Figures 7 and 8) are provided in the ends of each cross member for receiving two opposed strands of the wire, forming the screen, adjacent their points of intersection. When the slots are formed the free end **65** of the member is turned to a ninety degree angle so that the wires of the screen will be securely held in the slots by the adjacent edge of the bent portion and the corners of the cross member at the slots. The section of metal **66** connecting the sections of the member on opposite sides of the slots abuts against the wires near the intersection and prevents movement of the screen in any direction. These cross members can be easily assembled in place on the screen by merely bowing the member sufficiently to permit the free section beyond the slots to pass under the wires, before the members are fastened by bolts or rivets **58** and **60**. As seen in Figures 1, 2 and 3 vertical support **52** is placed on one side of the reflector and cross members **54** and **56** are placed on the other side to give the reflector greater rigidity and to hold the reflector and members **54** and **56** firmly together.

The front and rear assemblies are held in a predetermined spaced relation by supports **14** and **16**, the former consisting of a bracket secured to the back side of member **26** by a bolt **70** and having one leg **72** secured to the rear assembly by bolt **58** and another leg **74** having a projection **75** on the end thereof for seating into one of several holes **76** in vertical support **52**. Since the legs can be readily bent at the points where they join the front and rear assemblies, the serviceman can adjust the distance between the two assemblies to obtain the best performance by merely selecting the correct hole for projection **75**. In order to facilitate bending of the two legs for making the adjustment and for collapsing the front assembly onto the rear assembly for packaging and shipping, transverse slots **80** are provided at the point where the bending is to occur. Support **16** is secured at one end to the center of member **28** by a bolt **82** and at the other end to vertical member **52** by a bolt **84**. This support is also provided with transverse slots **80** to facilitate bending at the points where it joins onto support **52** and member **28** since support **16** must also bend when an adjustment in the spacing between the front and rear assemblies is being made and when the antenna is being collapsed for packaging and thereafter when it is being extended for installing.

Figure 11 illustrates a modified form of the adjustment means consisting of a slot **90** in place of holes **76** and a bolt or screw **92** in place of projection **75**. The modification has the advantage of being able to assume an infinite number of positions in the range of adjustments; however in order to facilitate making the proper adjustment for particular television channels a plurality of marks **94** for the various stations in the vicinity are placed along the side of the path of adjustment for member **74** and a single mark **96** is placed on member **74**. An adjustment is made by aligning mark **96** with the mark representing a particular channel and then tightening screw **92** to retain the setting made. To collapse the antenna with this type of adjustment means, screw **92** is merely loosened and leg **74** permitted to slide downwardly in slot **90**.

Figure 15 shows the manner in which my antenna is mounted on the mast. Vertical support **52**, which is U-shaped in cross section with the open side to the rear, is placed against the mast with the edges of the support in contact with the mast and the strap **100** of a conventional stand-off fixture **101** is inserted through slots **102** and **104**, shown in Figures 9, 10 and 11, wrapped around the mast **105**, and inserted in the slots of the rigid member **106** of the fixture. The strap is pulled tight and screw **108** is tightened to clamp the end of the strap against the mast and simultaneously place the strap under tension to pull the antenna firmly against the mast.

Two of these fixtures, one at the top and the other at the bottom of support **52**, are normally used although a greater number can be employed if desired. While the screw in the fixture is shown as such, it may be replaced with the standard stand-off clip for holding the lead from the antenna.

The lead wires are connected to the antenna by clamps such as those shown in Figures 12, 13 and 14 connected to the center of bars **44**. In Figures 12 and 13 the clamp consists of a flat section **110** paralleling the longitudinal surface of the bar and four legs **112** extending partially around the bar. The clamp is secured to the bar by a bolt **114** which, when tightened, clamps the end of one of the lead-in wires **115** between section **110** and the bar. In Figure 14 the clamp consists of an angular piece **116** clamped to the bar by a bolt **118** extending through section **120** and the bar. The wire is inserted through a hole **122** and between section **120** and the bar and bolt **118** is tightened, drawing section **120** firmly against the wire clamping it against the bar. Other suitable clamping means may be substituted for those just described.

After the antenna has been assembled and is ready to be shipped it is collapsed or folded by raising point **75** from hole **76**, if the embodiment of Figures 9 and 10 is used, or loosening screw **92**, if the embodiment of Figure 11 is used, and then pushing the front assembly toward the rear assembly causing supports **14** and **16** to bend at slots **80**. When the antenna is in its folded position, it can be shipped in a relatively thin carton consuming only about one third of the space which would be required if it could not be folded. When an installation is to be made the front assembly is pulled away from the rear assembly the desired distance and point **75** inserted in the proper hole **76** or screw **92** tightened to hold leg **74** at the proper mark **94**. The present antenna construction can be assembled, installed and serviced much more readily than present conventional antennas adapted for the same type of television reception and, while in service, will withstand adverse weather conditions more effectively than those in present use.

A few modifications in my antenna construction have been described herein. Other modifications and changes can be made without departing from the scope of the present invention.

I claim:

1. A television receiver antenna comprising a front assembly having a plurality of pairs of electrical conducting bars, a pair of closely spaced holes in each end of said bars, a V-shaped element of electrical conducting material held in said holes adjacent the point of said element, an insulating member rigidly holding said bars in spaced relation, electrical conducting members connecting the corresponding bars of each pair and a terminal on each of said members for connecting the lead wires thereto, a rear assembly having a vertically disposed support member, a screen-like reflector and a pair of cross members secured to said support member at the ends thereof and connected to said reflector with the strands of said reflector seated in slots at the end of said cross members, a bracket connected to each insulating member and to said support member and having a slot at each point at which they are connected to said members to facilitate bending, a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member, and means including a slot in said support member for mounting the antenna on a mast.

2. A television receiver antenna comprising a front assembly having a plurality of pairs of electrical conducting bars, a pair of closely spaced holes in each end of said bars, a V-shaped element of electrical conducting material looped through said holes, an insulating member rigidly holding said bars in spaced relation and electrical conducting members connecting the corresponding bars of each pair, a rear assembly having a vertically

disposed support member, a screen-like reflector and cross members secured to said support member at the ends thereof and connected to said reflector with the strands of said reflector seated in slots at the end of said cross members, a bracket connected to each insulating member and to said support member and having a slot at each point at which they are connected to said members to facilitate bending, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

3. A television receiver antenna comprising a front assembly having a plurality of pairs of electrical conducting bars, dipoles mounted on said bars, an insulating member rigidly holding said bars in spaced relation, electrical conducting members connecting the corresponding bars of each pair, a rear assembly having a vertically disposed support member, a reflector and a pair of cross members secured to said support member at the ends thereof and connected to said reflector, a bracket connected to each insulating member and to said support member and having a slot at each point at which they are connected to said members to facilitate bending, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point to said support member.

4. A television receiver antenna comprising a front assembly having a plurality of pairs of electrical conducting bars, dipoles mounted on said bars, an insulating member rigidly holding said bars in spaced relation and electrical conducting members connecting the corresponding bars of each pair, a rear assembly having a vertically disposed support member and a screen-like reflector mounted on said support member, a bracket connected to each insulating member and to said support member, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

5. A television receiver antenna comprising a front assembly having a plurality of pairs of electrical conducting bars, a pair of closely spaced holes in each end of said bars, a V-shaped element of electrical conducting material held in said holes adjacent the point of said element, an insulating member rigidly holding said bars in spaced relation and electrical conducting members connecting the corresponding bars of each pair, a rear assembly having a vertically disposed support member and a screen-like reflector mounted on said support member, and means for holding said assemblies in rigid spaced relationship.

6. A television receiver antenna comprising a front assembly having a plurality of pairs of electrical conducting bars, dipoles mounted on said bars, an insulating member rigidly holding said bars in spaced relation and electrical conducting members connecting the corresponding bars of each pair, a rear assembly having a vertically disposed support member and a reflector mounted on said support member, a bracket connected to each insulating member and to said support member, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

7. A television receiver antenna comprising, a front assembly having a plurality of pairs of electrical conducting bars, dipoles mounted on said bars, an insulating member rigidly holding said bars in spaced relation, electrical conducting members connecting the corresponding bars of each pair, a rear assembly having a vertically disposed support member and a bracket connected to each insulating member and to said support member and having a slot at each point at which they are connected to said members to facilitate bending, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

8. A television receiver antenna comprising, a front assembly having a pair of parallel electrical conducting bars, an insulating member rigidly connecting said bars, a rear assembly having a vertically disposed support member and a bracket connected to each insulating member and to said support member, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

9. In an antenna having a pair of parallel electrical conducting bars, a pair of closely spaced holes in each end of said bars, and a V-shaped element of electrical conducting material held in said holes adjacent the point of said element.

10. In an antenna having a pair of parallel electrical conducting bars, an insulating member rigidly connecting said bars, a pair of closely spaced holes in each end of said bars, and a V-shaped element of electrical conducting material looped through said holes.

11. In an antenna, a front assembly including driven elements and having insulating members for supporting said driven elements, a rear assembly having a vertically disposed support member, a bracket connected to each insulating member and to said support member, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

12. In an antenna, a front assembly including driven elements and having insulating members for supporting said driven elements, a rear assembly having a vertically disposed support member, a bracket connected to each insulating member and to said support member and having a slot at each point at which they are connected to said members to facilitate bending, and a bracket connected to one of said insulating members and being adapted to be connected at more than one point on said support member.

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