June 23, 1959 J. R. WINEGARD 2,891,748

TV ANTENNA SUPPORTING SUBSTRUCTURE FOR INSTALLATION ON THE SLOPE, RIDGE OR END OF A ROOF

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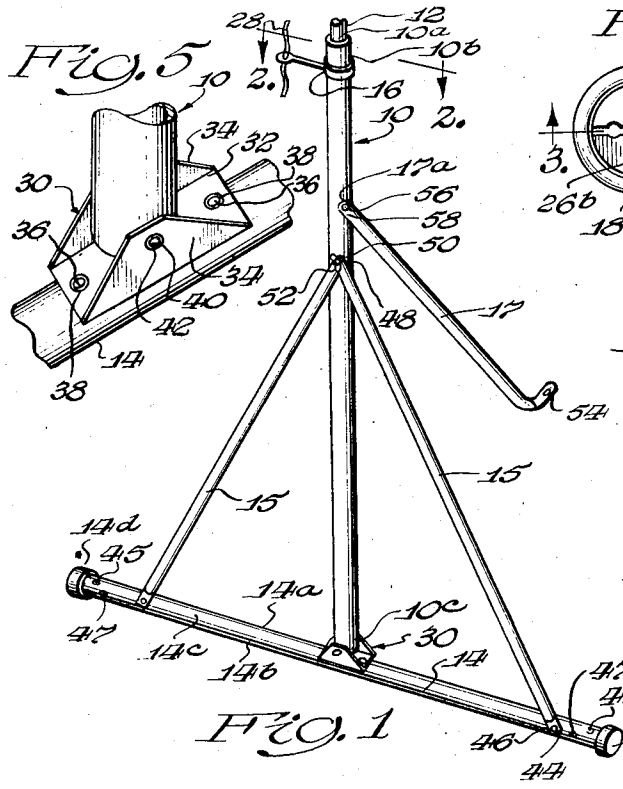


FIG. 1

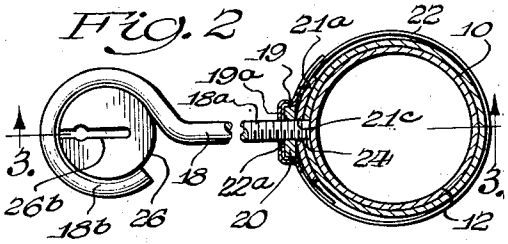


FIG. 2

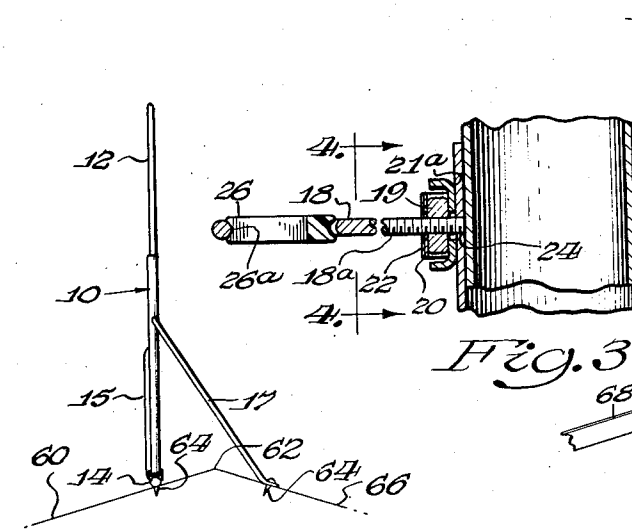


FIG. 3

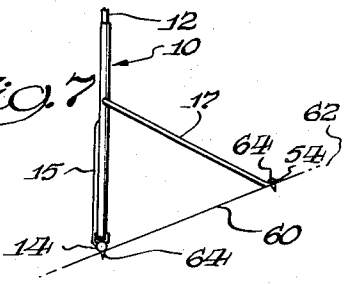


FIG. 7

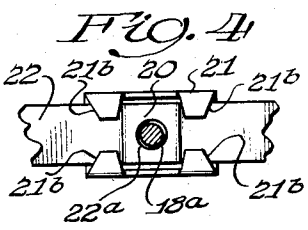


FIG. 4

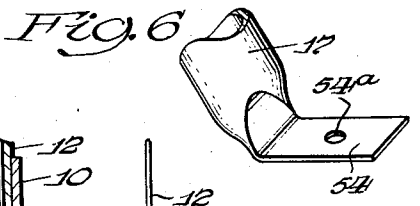


FIG. 6

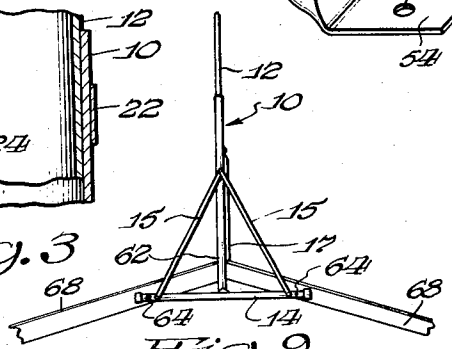


FIG. 9

FIG. 8

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TV ANTENNA SUPPORTING SUBSTRUCTURE FOR INSTALLATION ON THE SLOPE, RIDGE, OR END OF A ROOF

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1 Claim. (Cl. 248—46)

My invention relates to a prefabricated TV antenna supporting substructure for sustaining a TV antenna with its post in vertical position on the slope, the ridge or the end of a roof.

The use of a prefabricated antenna substructure is desirable in installing a TV antenna because of the simplicity and rapidity of the installation. The use of such a substructure obviates the need of cutting and fabricating material on the roof, or making repeated trips to the roof to measure the selected roof site.

One difficulty, however, with a prefabricated antenna substructure is that the selection of a site on the roof for the antenna installation is limited to those sites which can accommodate the prefabricated unit. With some prefabricated substructures there may be only one, or at most a few, possible sites on the roof to which the unit can be attached and yet sustain the antenna post in a vertical position. It is quite likely that the site which must be used for these units will not be the most desirable site for good reception. It is thus desirable, in a prefabricated substructure, that it be adaptable for installation on a wide variety of roof sites so that the antenna may be installed on the roof site affording the best television reception.

With present prefabricated substructures, it is necessary for the installer to get on the roof to mount the substructure. On many roofs, particularly those with steep slopes, this can be dangerous. Sometimes the physical condition of the roof or other factors may make it hazardous or difficult for the installer to get on the roof. It is therefore desirable that a substructure be mountable in a position where it is not necessary for the installer to climb onto the roof.

The substructure of the present invention can be installed on the slope, the ridge, or the end of a roof, the latter installation being possible without the installer climbing onto the roof. In brief, a vertical support tube, or post, which received and sustains the vertical antenna post, is connected at its lower end, or bottom, centrally between the ends of a horizontal base member. The base member is adapted to be connected at one side or the bottom to the roof. The vertical support tube is securely held perpendicular to the horizontal base member by guys connected between the support tube and base member. The support tube—and hence the antenna post—is also supported in the vertical position by a strut, swingably connected to the support tube.

The substructure of the present invention can be attached to the slope of a roof. In this installation the base member lies flat on the slope parallel to the ridge of the roof and the bottom of the base member is connected to the slope of the roof by suitable connecting means. The strut is pivoted so that its free end lies on the slope of the roof and is connected thereto. The substructure may also be installed adjacent the ridge of the roof in a manner

similar to the installation above described except that the strut straddles the ridge and its free end is connected to the slope opposite the slope to which the base member is attached. The substructure may also be installed at the end of the roof. In this installation the horizontal base member is connected on one side to the opposed end rafters. The strut is pivoted so that its free end lies on the ridge of the roof and is connected thereto. It should be noted that this latter installation can be achieved without the installer climbing onto the roof.

It is therefore a general object of the present invention to provide a substructure to sustain a TV antenna post in vertical position on the slope, ridge, or end of a roof.

It is another object of the present invention to provide a prefabricated and preassembled TV antenna substructure which securely supports the antenna post in a vertical position by rigid members.

It is yet another object of the present invention to provide a prefabricated and preassembled TV antenna substructure adaptable for installation on a wide variety of roof sites which is foldable for easy portability and shipment.

It is a further object of the present invention to provide a prefabricated TV antenna substructure which may be installed without the necessity of the installer climbing onto the roof.

It is still another object of the present invention to provide a prefabricated and preassembled antenna substructure which is sturdy, of simple construction, inexpensive to fanufacture, and effective to sustain a TV antenna post in vertical position.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claim. My invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, will be best understood by reference to the following description taken in conjunction with the accompanying drawing in which:

Figure 1 is a view in perspective of the TV antenna substructure of the present invention;

Figure 2 is a view through section 2—2 of Figure 1;

Figure 3 is a view through section 3—3 of Figure 2;

Figure 4 is a view through section 4—4 of Figure 3;

Figure 5 is a view in perspective of the foot saddle;

Figure 6 is a view in perspective of the outer end portion of the strut;

Figures 7 and 8 are cross-sectioned views through a roof showing the antenna substructure installed, respectively, on the slope and ridge of a roof; and

Figure 9 is an elevational view showing the end of a roof with the antenna substructure installed.

The antenna substructure of the present invention is shown in Figure 1. The substructure has a vertical support tube, or post, shown generally at **10**, a horizontal base member **14**, guys **15**, and strut **17**. The support tube **10** has an upper end **10***b* and a lower end **10***c*. An opening **10***a* at the upper end of the tube receives an antenna post **12**.

The antenna post **12** is secured in the support tube **10** by means of a clamping member, shown generally at **16**, encircling the support tube adjacent its upper end (see Figures 2, 3, and 4).

As shown in Figures 2 and 3 the clamping action is obtained by set screw **18**, having threads **18***a* at one end. At the opposite end set screw **18** is bent to form a generally circular frame **18***b* as shown in Figure 2. Clamp **16** has a strap **22** which encircles support tube **10**. The ends of the strap **22** overlap to a considerable extent as shown in Figure 2. The support tube **10** has a hole **24** adjacent end **10***b*. The strap **22** is crimped outwardly, in the area of overlapping, to form a well **20** opposite hole **24**. The strap **22** has a hole **22***a* through the over-

lapping ends adjacent the well 20 as shown in Figure 4. A nut 19, with a threaded hole 19*a*, adapted to receive the threaded end 18*a* of the set screw, is snugly received in well 20. A clasp 21, having a curved base 21*a*, is sandwiched between the support tube 10 and the strap 22. The clasp 21 has four outwardly extending ears 21*b*, as shown in Figure 4, which are bent over to embrace strap 22 on either side of well 20. The clasp 21 retains the nut 19 in the well 20 and holds the overlapping ends of strap 22 together. Clasp 21 has a hole 21*c* in the base 21*a* to pass the set screw 18. The threaded end 18*a* of set screw 18 is received in hole 22*a*, threadedly engages nut 19, and passes through hole 21*c* in the clasp and hole 24 in the support tube 10, to engage the post 12 in clamping action and hold it in fixed relation to the support tube 10.

At the end opposite the threads the set screw 18 has a circular frame 18*b* which carries an insulated disc 26. The disc 26 receives and sustains a transmission line 28 in spaced relation to the substructure. The disc 26 has a groove 26*a* around its edge, as shown in Figure 3, to receive the circular frame 18*b*. A lot 26*b* receives and sustains the transmission line 28.

An elongated base member 14 has a top 14*a*, bottom 14*b*, and sides 14*c*. A cap 14*d* encloses each end of the base member 14. The base member has a foot saddle, shown generally at 30, connected to the top 14*a* and centrally located between its ends. The foot saddle 30 has a base 32 and upturned sides 34 as shown in Figure 5. The foot saddle 30 is secured to the base member 14 by means of rivets 36 which are received in holes in the base 32 adjacent each end and extend through the base member 14. A washer 38 is interposed between the base 32 and the peened head of the rivet 36.

The lower end 10*c*, or bottom, of the support tube 10 is received between the upturned sides 34 of the foot saddle and is spaced from the base 32 of the foot saddle. The tube 10 is pivotally secured to the foot saddle by means of rivet 40 which is received in holes in the sides 34 of the foot saddle and holes adjacent the lower end 10*c* of the tube 10. Washers 42 are interposed between the sides 34 of the foot saddle and the heads of the rivet 40.

The guys 15 as shown are tubes with each end flattened. A hole in each flattened end receives the connecting means by which the guys 15 are secured to the base member 14 and the support tube 10. It should be noted that the guys 15, although shown in this embodiment as tubes, need not be rigid members but instead can be members under tension to sustain the support tube 10.

Between the foot saddle 30 and each end of the base member 14 a rivet 44 passes through the base member 14 from one side to the other. Each rivet 44 receives at one end a guy 15 which is sandwiched between the washers 46 carried on the rivet. The guy 15 is attached so as to be swingable in relation to base member 14. The opposite ends of the guys 15 are received on a bolt 48, which is received in the support tube 10. The guys 15 are detachably secured to bolt 48 by means of washer 50 and wing-nut 52.

A hole 45 extends through the base member 14 from top 14*a* to bottom 14*b* adjacent each end of the member 14. Another hole 47 extends through the base member 14 from side to side adjacent the hole 45. Thus the axes of holes 45 and 47 are perpendicular to each other.

The strut 17 is a rigid member which extends between the support tube 10 and the roof to sustain the support tube by column action in a vertical position. In sustaining the support tube 10 in a vertical position the rigid strut 17 is capable of resisting either compressive or tensile forces. The strut may be a tube with its upper end 17*a* flattened and having a hole for connection to the support tube 10.

As shown in Figure 6 the strut 17 at its lower outer

end, or free end, has a flattened end portion, or foot, 54 with an opening 54*a*. The end portion, or foot, 54 can be bent at an angle from the axis of the strut 17 to conform to the slope of the roof. The strut 17 is received on rivet 56 which passes through the support tube 10 parallel to the base member 14. The strut 17 is sandwiched between two washers 58 and is connected to be swingable in a plane normal to the base member 14.

It will be noted that with this construction the antenna substructure may be preassembled and yet be readily foldable into a compact unit. The guys 15 are swingably connected to the base member 14 and detachably connected to the support tube 10 so that they can be folded to lie parallel with and adjacent to the member 14. The strut 17 is swingably connected to the support tube 10 so that it may be folded to lie parallel with and adjacent to the tube 10. Also the support tube 10 is swingably connected to the base 14 so that it may be swung parallel to and adjacent that member. Thus, the support tube 10, the base member 14 and the two guys 15, and the strut 17 will all fold to form a compact unit, easily portable and readily packaged for inexpensive shipment.

The antenna substructure of the present invention can be installed on a roof of nearly any slope, the ridge of a roof, or the end of a roof. As shown in Figure 7, the antenna substructure is installed on the slope 60 of a roof with the support tube 10 carrying the antenna post 12 in the vertical position. The base member 14 lies horizontally along the roof parallel to the ridge 62 and the guys 15 sustain the support tube 10. The strut 17 which is swingably connected to support tube 10 may be swung to the desired angle to be connected to the roof and rigidly hold the support tube 10 in the vertical position. The bendable end portion or foot, 54, of the strut 17 may be bent to conform to the slope of the roof. The antenna is secured to the roof by attaching means, which may, for example, be screws 64 received through the hole 54*a* in the end portion, or foot, 54 and in the holes 45 of the base member 14.

As shown in Figure 8 the substructure of the present invention may be installed on the ridge 62 of a roof. As in the installation of Figure 7, the base member 14 lies horizontally along the roof parallel to the ridge, on the slope, 60, and the guys 15 rigidly hold the support tube 10 in the vertical position. The strut 17 is swung down until it contacts the slope 66 opposite the slope 60, thus straddling the ridge 62 of the roof. In this installation the roof attaching means 64 are similarly received through holes 54*a* and holes 45.

Figure 9 shows the substructure of the present invention installed on the end of a roof. In this installation the base member 14 is aligned horizontally between the end rafter 68 of the roof and is connected thereto by attaching means 64 received through the holes 47. In this installation, the guys 15 also serve to sustain the support tube 10 in the vertical position. The strut 17 is swung until it contacts the ridge 62 of the roof and is secured thereto by attaching means 64 received in hole 54*a* to rigidly hold the support tube 10 in the vertical position. This latter installation can be readily made without climbing onto the roof.

Thus an antenna substructure is provided which may be folded for compact shipping and portability to the roof. The substructure can be quickly and easily unfolded and installed by one man without the necessity of any special tools, and if necessary, without climbing onto the roof. The substructure is readily adaptable to any roof or any position on the roof without the need of cutting, drilling or modification of any kind. When installed, the substructure will rigidly hold the antenna post in a vertical position. It will be noted that the post 10, the base 14, and the struts 15 are substantially in a common plane. This enables these parts to seat

against the vertical end of a roof as shown in Figure 9, that is with base 14 nailed at its ends (through holes 47) to the sloping end boards or rafters on the roof and the post 10 being adjacent these boards at the peak of the roof. Also, the base 14 forms the bottom margin of this part of the assembly, so that the base 14 seats or rests flat (and with stability) on the planar surface of the roof as shown in Figures 7 and 8 and requires only the lateral support of the strut 17.

While I have shown and described a specific construction, it will, of course, be understood that various modifications and alternative construction may be made without departing from the true spirit and scope of the present invention. I, therefore, intend by the appended claim to cover all modifications and alternative constructions falling within its true spirit and scope.

What I claim as new and desire to secure by Letters Patent of the United States is:

A universal foldable support for a TV antenna for installation on roof surfaces of varying slope and conformation or on the vertical surface defined by the end rafters of a roof, the support comprising: a pair of members, one of said members being an elongated support post adapted to sustain an antenna structure when in vertical position and the other of said members being an elongated base, the base being of material and conformation adapted to be affixed near its ends to a support surface underlying the same or in the alternative to a support surface at the side of the same; means pivotally attaching one end of the support post to the base for folding rotation about an axis normal to the plane defined by the members; at least one guy; means pivotally attaching one end of said guy to one of said members; means releasably attaching the other end of said guy to the other of said members, the said members and said guy being all located in substantially a common plane to seat against the end of a roof, and the base defining the lower margin of the structure formed by the members so that alternatively the base member can seat on a planar roof surface; a strut; means securing the strut to the support post for swinging movement in a plane at an angle to said common plane and about an axis generally parallel to the base and spaced from the base by a distance shorter than the length of the strut; and means to affix the ends of the base and the free end of the strut to the supporting structure.

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