United States Patent

White

[15] 3,683,392

[45] Aug. 8, 1972

[54] **CONVERTIBLE ANTENNA-MOUNTING STRUCTURE**

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[22] Filed: **Dec. 2, 1969**

[21] Appl. No.: **881,456**

[52] **U.S. Cl.** **343/805,** 343/721, 343/797, 343/880, 343/882, 343/888, 343/890, 343/893

[51] **Int. Cl.**.....**H01q 1/08,** H01q 1/12, H01q 21/00

[58] **Field of Search**.....343/702, 720–721, 343/793–797, 878–892, 893

[56] **References Cited**

UNITED STATES PATENTS

D190,339	5/1961	Hodson	D48/20
2,259,628	10/1941	Fener et al.	343/797 X
2,496,646	2/1950	Winer	343/724
2,570,333	10/1951	Ercolino	343/892 X
2,583,066	1/1952	Stiffel	343/721
2,640,932	6/1953	Robbins	343/890 X
3,208,703	9/1965	Arnold et al.	343/892 X
3,308,471	3/1967	Weston	343/882

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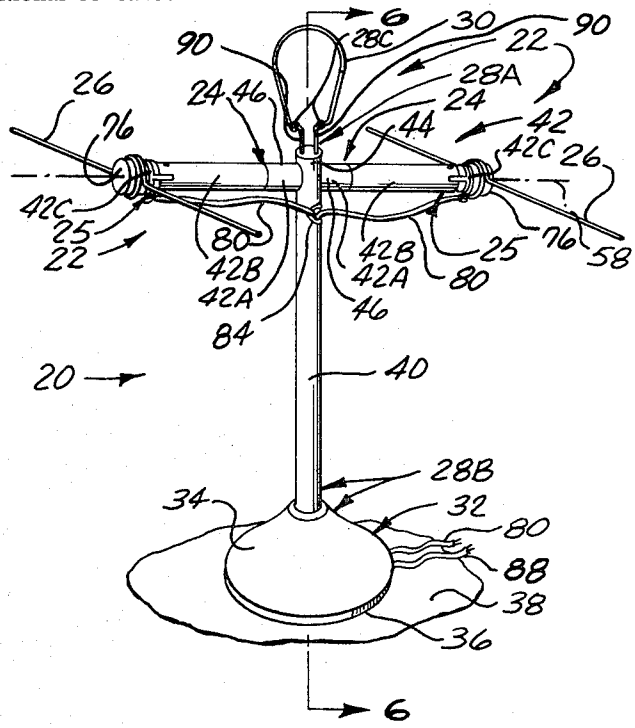
Assistant Examiner—Marvin Nussbaum

[57] **ABSTRACT**

The specification discloses an antenna-mounting structure provided with engaging means adapted to interchangeably engage and be supported by any of a plurality of different auxiliary supporting structures, such as a portion of a television set (in one form, as a replacement for the conventional so called "rabbit ears" antenna means conventionally provided thereon), such as an auxiliary bracket, or the like, adapted to be attached to a television set or any other auxiliary mounting object or structure, such as a somewhat enlarged mounting base having a downwardly directed contact surface adapted to be movably placed upon any appropriate horizontal supporting surface of any supporting structure either near to or remote from a television set, or the like, such as a coupling means for coupling the antenna-mounting structure with respect to a lamp, either at the top of the conventional lamp shade-mounting harp structure thereof, or by attachment to the pole portion of a pole lamp means or otherwise, or such as by functionally similar, supported attachment with respect to various other auxiliary supporting objects, and with the antenna-mounting structure being adapted to mount in a readily and individually adjustable manner separate portions (of any desired number) of an antenna adapted to receive very high frequency television signals and/or, if desired, being provided with another portion (or plurality of portions) adapted to adjustably mount an antenna portion (or plurality thereof) adapted to receive ultra-high-frequency television signals and with either or both of said antenna portions being provided with novel electrical attachment or connector means for antenna lead-in wire means adapted to be carried in a preferred form within a framework portion of the antenna-mounting structure to a location close to the corresponding conventional antenna terminals of a television set. The framework of the antenna-mounting structure, in a preferred form, has antenna-mounting portions, which allow for the ready interchanging of the antenna portions in addition to the easy positioning adjustment thereof whereby to facilitate the reception of various different types of signals at various locations and under various conditions of reception and operation.

3 Claims, 14 Drawing Figures



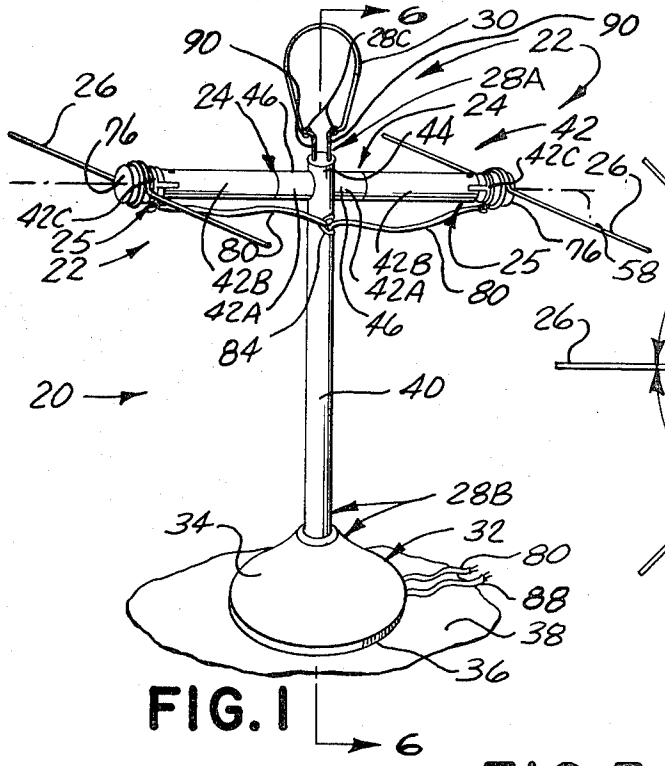


FIG. 1

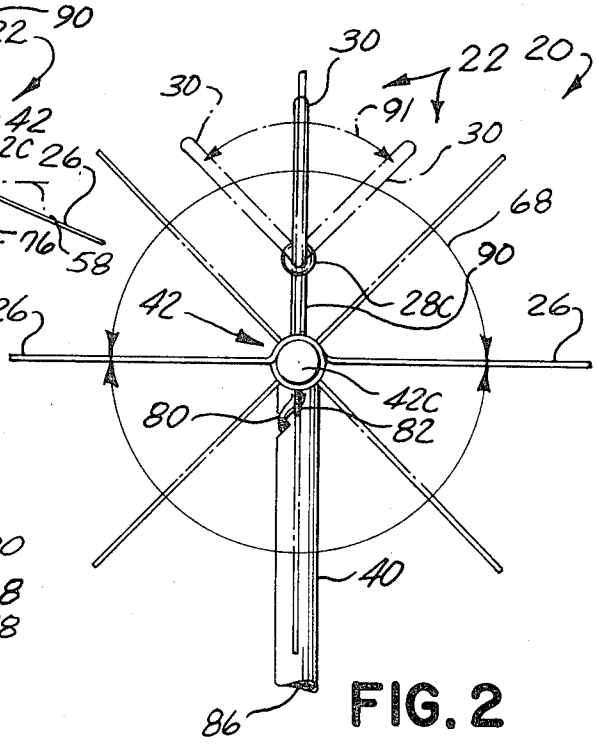
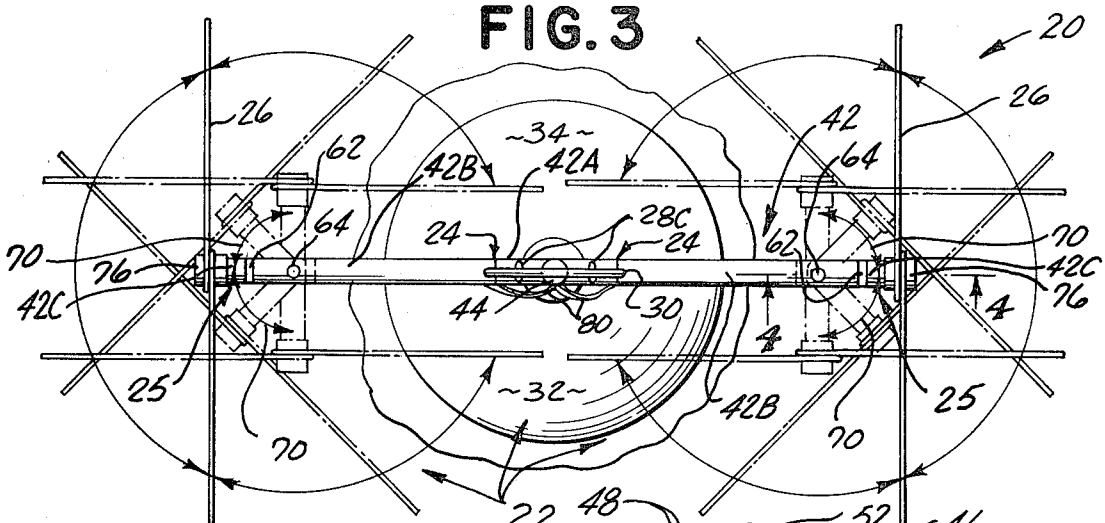


FIG. 2

FIG. 3



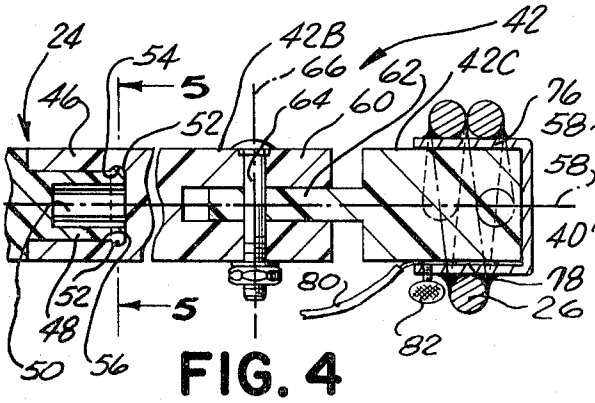


FIG. 4

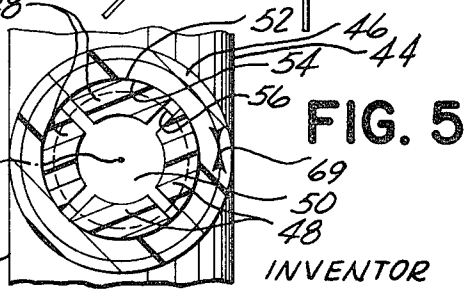


FIG. 5

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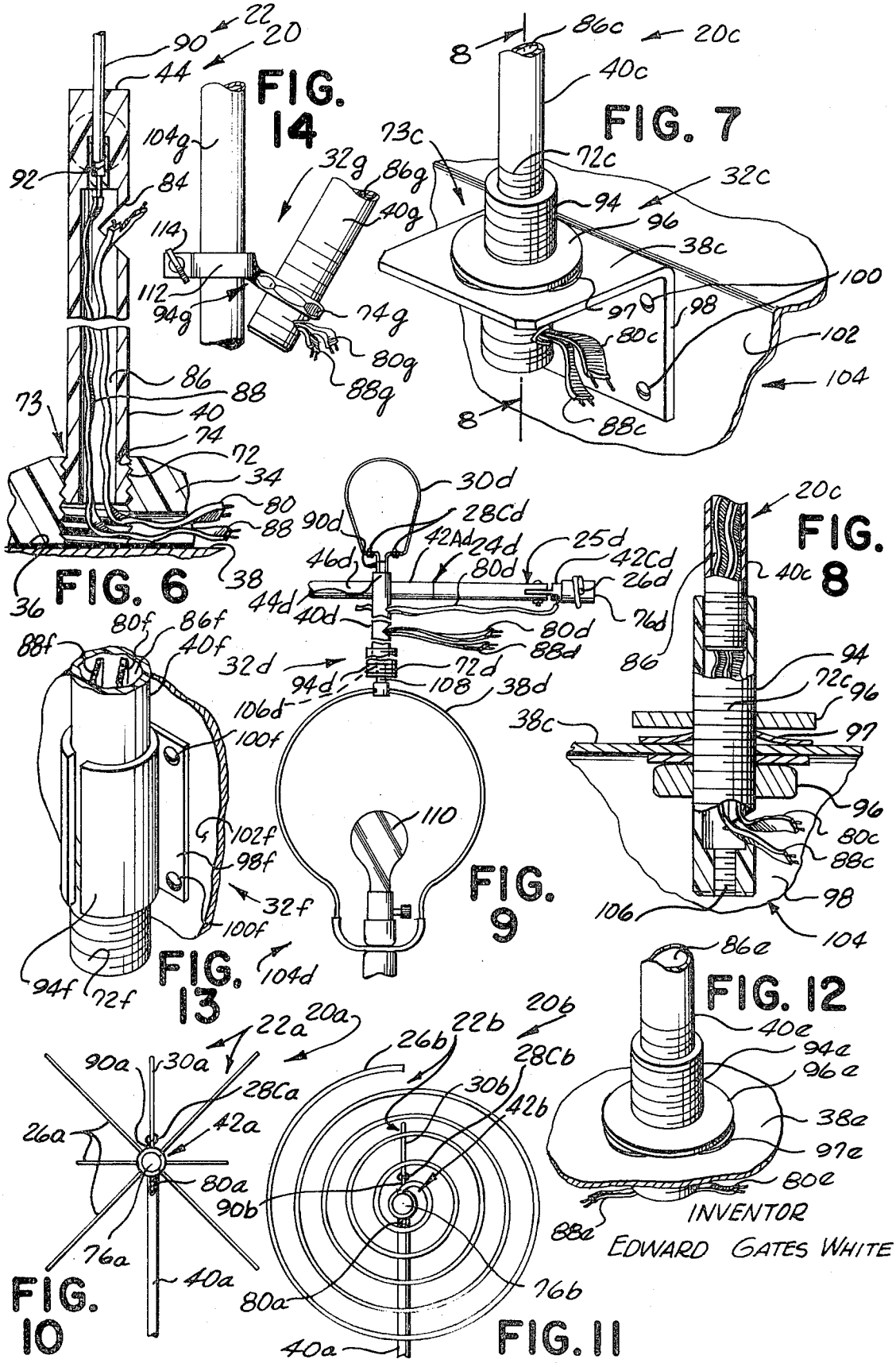
FIG. 14
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CONVERTIBLE ANTENNA-MOUNTING STRUCTURE

Generally speaking, the present invention comprises a multi-engageable and multi-supportable antenna-mounting structure of an extremely adaptable type provided with means for mounting one or more antenna portion(s) intended for reception of what is conventionally known in the art as very high frequency television signals and/or for the reception of what is known in the art as ultra-high-frequency television signals. The apparatus lends itself to being easily modified for the reception of either type of signal alone and without the other or for the reception of either type of signal alternatively. Also, the interchangeable antenna portion mounting feature of the apparatus makes it possible to easily remove one type of antenna portion and replace it with another type of antenna portion which may be more suitable for reception of the corresponding very high frequency or ultra-high-frequency television signal in a particular area, such as a fringe area or the like, or an area having "ghosts" or other reception problems, thus making the antenna-mounting structure extremely adaptable to allow it to be optimized for perfect reception by repositioning adjustment and/or replacement of the antenna portions. Also, the antenna-mounting structure is arranged to engage and be mounted by any of a number of different types of auxiliary supporting structures, such as a conventional television receiver (in one form, in lieu of the conventional "rabbit ears" type of antenna means conventionally provided on many television receivers), a movable mounting base, a conventional or television lamp, a pole-type lamp, or a variety of other types of auxiliary supporting objects. This mounting adaptability makes it possible to support the antenna in any of a variety of convenient locations on any of a variety of different conventionally available auxiliary supporting objects or structures, thus facilitating the use of the apparatus.

A preferred form of the invention also includes novel, electrically conductive coupling or attachment means for electrically connecting any of the interchangeable antenna portions with respect to antenna lead-in wire means without requiring time-consuming soldering and the like for making such electrical connections.

With the above points in mind, it is an object of the present invention to provide a novel antenna-mounting structure of the type referred to herein having any or all of the advantages referred to herein and including any or all of the features referred to herein, generically and/or specifically, and individually or in combination, and which is of extremely simple, inexpensive, easily manufactured, easily assembled, and easily mounted construction, such as to facilitate the widespread and large-scale manufacture, sale, and use of the invention for the purposes outlined herein or for any substantial equivalents thereof.

Further objects are implicit in the detailed description which follows hereinafter (which is to be considered as exemplary of, but not specifically limiting, the present invention), and said objects will be apparent to persons skilled in the art after a careful study of the detailed description which follows hereinafter, and all such implicit objects are intended to be included and comprehended herein, as fully as if particularly defined and pointed out herein.

For the purpose of clarifying the nature of the present invention, several exemplary embodiments of the invention are illustrated in the hereinbelow-described figures of the accompanying two sheets of drawings and are described in detail hereinafter.

FIG. 1 is a greatly-reduced-size fragmentary perspective view illustrating one exemplary embodiment of the present invention in fully assembled form, shown engaged with respect to one of several different interchangeable types of auxiliary supporting objects and also shown carrying two different types of antenna means comprising a very high frequency television signal-receiving antenna means (in two similar separate antenna portions) and further comprising an ultra-high-frequency television signal receiving antenna means carried at the top of the antenna-carrying framework means.

FIG. 2 is a somewhat-larger-scale fragmentary elevational view of the exemplary embodiment of the invention shown in FIG. 1 as it would appear when seen from the right end of the cross-bar portion of the antenna-carrying framework means and further illustrates, by the circular, double-headed, oppositely directed arrows and by the phantom line showing of the very high frequency antenna means, one type of rotative adjustment of said very high frequency antenna means which is made possible by one particular exemplary type of pivotal physical-position-adjustment means and which facilitates optimizing the television signal reception characteristics of the very high frequency antenna means. This figure also illustrates another type of physical-position-adjustment means for the exemplary ultra-high-frequency antenna portion which allows it, in effect, to be pivoted around a horizontal axis into a desired adjusted position for optimum reception of ultra-high-frequency television signals.

FIG. 3 is a top plan view of the exemplary first embodiment of the invention and at each end of the cross-bar portion of the antenna-carrying framework means illustrates in phantom lines and by the provision of the double-headed arrows another type of physical-position-adjustment movement of the very high frequency antenna means made possible by the novel structure of the antenna-carrying framework means of the exemplary first form of the invention.

FIG. 4 is an enlarged, fragmentary, sectional view taken substantially along the plane and in the direction indicated by the arrows 4—4 of FIG. 3 and illustrates the two different types of position-adjustment means illustrated in operation in FIGS. 2 and 3, respectively, and also illustrates in longitudinal central section one exemplary type of electrically conductive coupling and/or attachment means for connecting each of the two very high frequency antenna means portions, with respect to the corresponding antenna lead-in wire means in an easily interchangeable manner.

FIG. 5 is an enlarged cross-sectional view taken substantially along the plane and in the direction indicated by the arrows 5—5 of FIG. 4 and illustrates one of the two different types of pivotal physical-position-adjustment means in cross-section. The double-headed arrow indicates the type of rotary adjustment of the antenna-carrying portions of the cross-bar which are made possible by adjustment means.

FIG. 6 is an enlarged fragmentary, partly-brokenaway view taken substantially along the plane

and in the direction indicated by the arrows 6—6 of FIG. 1, but with all portions of the apparatus behind the plane of the view removed for reasons of drawing simplicity and clarity.

FIG. 7 is an enlarged, fragmentary, partially broken-away perspective view illustrating a modified type of mounting means for mounting the entire device with respect to any of a variety of different types of auxiliary supporting objects — in this case said mounting means comprising a right-angle bracket, attachment means, and engagement means.

FIG. 8 is a fragmentary sectional view taken substantially along the plane and in the direction indicated by the arrows 8—8 of FIG. 7.

FIG. 9 is a greatly reduced, fragmentary view illustrating a further modified type of mounting means including coupling means for coupling and mounting the entire device with respect to the top fineal-mounting portion of the lamp-shade-mounting harp structure of a conventional lamp.

FIG. 10 is a view generally similar to FIG. 2, but illustrates a modified type of very high frequency antenna means portion carried by each end of the cross-bar means.

FIG. 11 is a view generally similar to FIG. 10 but illustrates a further modification of the very high frequency antenna means portion carried by each end of the cross-bar means.

FIG. 12 is a fragmentary perspective view very similar to FIG. 7 but shows the mounting means in this case as including an actual surface portion of an auxiliary supporting object rather than being attached thereto by way of a right-angle bracket, as shown in FIG. 7.

FIG. 13 is a fragmentary perspective view of another type of mounting means and wherein one portion of the engaging means comprises a threaded receiver having a laterally facing attachment bracket portion adapted to be fastened to a vertical surface of an auxiliary supporting object in a manner which is functionally very similar to the arrangement illustrated in FIG. 7, although requiring less space.

FIG. 14 is a fragmentary side-elevational view illustrating a further modification of the mounting means and of the engaging means thereof, including two laterally displaced, angularly related portions, one of which comprises an engaging means portion at the bottom of the antenna pole and the other of which comprises a coupling-and-clamp-type engaging portion adapted to removably clampably engage any desired portion of the vertical pole of a fragmentarily shown pole-type lamp means of the variety where the pole extends from floor to ceiling and is forcibly abutted against each of same for positioning the pole, or is supported at the bottom by a conventional enlarged base.

Generally speaking, the present invention comprises an antenna-mounting structure adapted to interchangeably engage and be supported by any of a variety of different types of auxiliary supporting structures. In the exemplary first form of the invention illustrated in FIGS. 1–6 inclusive, the antenna-mounting structure comprises antenna-carrying framework means, one exemplary form of which is generally designated by the reference numeral 20, which is provided with and carries one or more antenna elements or antenna portions of antenna means, generally designated by the reference numeral 22 in said exemplary first form of the invention.

Also, generally speaking, the apparatus includes physical-position-adjustment means providing for adjustment of various portions of the antenna means 22 for optimum coupling with respect to a corresponding electromagnetic field, usually for optimum receptivity coupling with respect to an electromagnetic field adapted to be received thereby, although not specifically so limited in all forms of the invention.

The physical-position-adjustment means referred to in the preceding paragraph is in the form of two similar pairs of such physical-position-adjustment means with similar ones thereof being designated, respectively, by the reference numerals 24 and 25, in the exemplary first form of the invention, with respect to the two laterally spaced antenna portions 26 which, in said exemplary first form of the invention, are of the type conventionally known as television very high frequency antenna portions adapted to efficiently receive the conventional very high frequency television signal carrier wave radiated by conventional very high frequency television transmitting stations. However, it should be noted that there are additional effective physical-position-adjustment means, generally designated by the reference numeral 28A, 28B, and 28C, which make it possible to arrange the position of the other antenna portion 30 which, in the exemplary first form of the invention, is of a type conventionally known as an ultra-high-frequency television signal receiving antenna portion adapted to receive a conventional ultra-high-frequency television signal carrier wave radiated by a conventional ultra-high-frequency television signal transmitter. The details of said physical-position-adjustment means 24, 25, 28A, 28B, and 28C will be explained in detail hereinafter.

Also, generally speaking, the antenna-carrying framework means 20 is provided with mounting means adapted for use in effectively mounting the entire antenna-carrying framework means 20 and the antenna means 22 with respect to an auxiliary supporting structure of any desired type. In the exemplary first form of the invention illustrated, said mounting means is generally designated by the reference numeral 32 and takes the form of an enlarged mounting base member 34 having a bottom-positioned contact means or surface 36 adapted to rest upon a substantially horizontally directed, underlying auxiliary supporting surface means 38 comprising the previously mentioned auxiliary supporting structure so that the entire device can be placed upon any flat auxiliary supporting surface similar to that fragmentarily shown at 38 in FIGS. 1 and 6, for example, and can be moved about at will and placed upon any other appropriate auxiliary flat supporting surface functionally equivalent to that shown at 38.

In the exemplary first form of the invention illustrated in FIGS. 1–6, the antenna-carrying framework means 20 is of substantially cruciform shape and includes a substantially vertically directed pole portion 40 and a substantially transversely directed cross arm portion 42 carried near the upper end 44 of the pole portion 40. The two very high frequency antenna portions 26 are physically spaced apart and of similar con-

figuration and are carried by opposite ends of the cross arm portion 42 in a manner providing for two corresponding different types of pivotal adjusting movement around two corresponding mutually perpendicular pivot axes by reason of the positioning of the two different parts of the physical-position-adjustment means 24 and 25 between the inner cross arm portions 42A and the outer antenna mounting parts 42C of the complete cross arm indicated generally at 42. Indeed, in the exemplary first form of the invention illustrated, each of the two physical-position-adjustment means 24 comprises an outer, centrally hollow, recessed sleeve part 46 carried by what might be termed a middle portion 42B of the complete cross arm 42, which receives therein an outwardly axially projecting stud or effective pivot pin portion 48 carried by the corresponding cross arm portion 42A. The effective pivot pin 48 is hollow, as indicated at 50, and has at its outer end an enlarged detent flange 52 adapted to be resiliently snapped into a corresponding annular detent groove 54 so as to make it possible to snap the effective pivot pin 48 into the recess 56 formed within the hollow sleeve 46 whereby to fully engage the first pivot means comprising the first or inner physical-position-adjustment means 24— it being understood that there are two of these at equal distances on opposite sides of the pole portion 40 and that each provides for relative rotation of the outwardly adjacent cross arm portions 42B and 42C around a horizontal axis of rotation such as is indicated in broken lines at 58.

The next outwardly adjacent pair of said physical-position-adjustment means, each of which is generally designated by the reference numeral 25, takes the form of second pivot means, also designated by the reference numeral 25, having a bifurcated yoke portion 60 positioned at the outer end of each of the two intermediate cross arm portions 42B receiving therebetween an inwardly directed tongue portion 62 carried by the corresponding outwardly extreme portion 42C of the cross arm 42 which, incidentally, also comprises the antenna mounting portion carrying the two (or, in some forms of the invention, more than two) very high frequency antenna portions 26 thereon. An effective pivot pin 64 which, in the example illustrated, takes the form of a bolt and nut, extends transversely through the bifurcated yoke 60 and the tongue 62 in a manner effectively pivotally mounting the extreme outer antenna-carrying portion 42C of the complete cross arm 42 for rotation around the other axis, indicated in broken lines at 66, which it will be noted is perpendicular to the first-mentioned axis of rotation 58 of each of the antenna-carrying portions 42C of the cross arm 42.

Thus, it will be seen that each of the antenna portions 26 is free to move around two mutually perpendicular axes comprising the above-described axes 58 and 66, with the first type of movement being best shown by the arrows 68 of FIG. 2 and the arrows 69 of FIG. 5, and with the second type of adjusting movement being best shown by the arrows 70 of FIG. 3. Of course, it is also possible to adjust the entire antenna-carrying framework means 20 around a vertical axis concentric with the pole portion 40 by merely repositioning the mounting base 34 or by adjusting the relative rotative relationship of the mounting pole 40 with respect to the base 34, which can be accomplished by relatively rotating the male threads 72 carried at the bottom end of the pole portion 40 within the female threads 74 of the mounting base portion 34, which two sets of male and female threads 72 and 74 may be said to comprise one specific type of engaging means of one specific type of mounting means 32 for engaging the bottom end of the pole portion 40 with respect to the enlarged base member 34.

It should be noted that the pivot means 24 and 25 are preferably such as to have sufficient frictional engagement between the relatively rotatable parts thereof as to cause said relatively rotated parts to be frictionally held in any adjusted position until manual readjustment thereof, although, if desired, additional position locking or position-holding means may be provided for this purpose, and all such arrangements are intended to be included and comprehended within the broad scope of the present invention.

The antenna portions 26 are adapted to be provided with electrically conductive coupling means and antenna lead-in wires for connecting the antenna portions 26 with respect to corresponding antenna terminals of a television receiver. In the exemplary first form of the invention illustrated, said electrically conductive coupling means takes the form of electrically conductive slip-over caps (usually made of metal), such as are designated at 76, adapted to be slipped over each outer coupling portion 42C of the cross arm 42 of the antenna-carrying framework means 20 and provided thereon in electrically conductive relationship thereto with a corresponding antenna portion 26. Thus, it is only necessary to slip the electrically conductive end connection part 78 of the corresponding antenna lead-in wire 80 between the exterior surface of the corresponding outer end portion 42C of the cross arm 42 (which is made of an electrically non-conductive material) and the inner surface of the slip-over end cap 76 (which is electrically conductive). This will provide an effective electrical connection between each corresponding very high frequency antenna portion 26 and each corresponding very high frequency antenna lead-in wire 80. If desired, this may be further facilitated by providing a set screw 82 adapted to be threaded inwardly and tightened against the antenna lead-in wire end connection part 78 in a manner adapted to firmly lock same in electrically conductive engaged relationship with respect to the corresponding electrically conductive coupling cap 76. However, the set screw 82 is optional and may be eliminated in certain forms of the invention.

It should be noted that, while each of the very high frequency antenna portions 26 is shown as being electrically soldered, brazed, welded, or otherwise permanently affixed to the exterior of the corresponding electrically conductive end cap 76, the invention is not specifically so limited, and it is quite possible and within the scope of the present invention to have the end cap and the circular, central loop of the antenna portion 26 not permanently engaged but merely adapted to be resiliently frictionally engaged in a slip-over manner when desired. The end result will be a position substantially the same as that shown in FIGS. 1, 3, and 4.

In any event, it will be readily understood that the electrical coupling arrangement described immediately

hereinbefore makes it possible to have a number of different types of antenna portions which can be quickly mounted on the antenna-carrying parts 42C of the cross-bar means 42 whenever such variation in the type of antenna portions 26 is desired. For example, one such variation in said antenna portions is illustrated in FIG. 10 wherein similar parts are designated by similar reference numerals, followed by the letter "*a*", however, and another such antenna portion modification is illustrated in FIG. 11 wherein similar parts are designated by similar reference numerals, followed by the letter "*b*", however. Since FIGS. 10 and 11 merely illustrate the substitution of corresponding different pairs of antenna portions such as shown at 26*a* in FIG. 10 and such as shown at 26*b* in FIG. 11, in lieu of the two antenna portions 26 shown in the first form of the invention and adapted to be mounted by electrically conductive end caps similar to those shown at 76 in the first form of the invention, no further detailed description of the very slight antenna modifications shown in FIGS. 10 and 11 is believed necessary or desirable.

The very high frequency antenna lead-in wires 80, in the exemplary first form of the invention, are passed through an opening 84 into the hollow interior 86 of the antenna pole portion 40 and then are carried within the antenna pole to the mounting base 34 thereof where they egress in a transverse direction for appropriate connection by suitable conventional electrical connector means or soldering to the conventional very high frequency antenna terminals of a near or remote conventional television receiver (neither of which are shown since such arrangements are well known in the art and do not touch upon the real inventive concept of the present invention).

In the exemplary first form of the invention, the complete antenna means 22 also includes the ultra-high-frequency antenna portion 30 (which in some forms of the invention, may comprise more than one portion) which is removably carried by the upper end 44 of the antenna pole 40. In the exemplary first form of the invention illustrated, means for electrically connecting the ultra-high-frequency antenna portion 30 with respect to the corresponding ultra-high-frequency antenna lead-in wires 88 is of what might be termed a plug-in and plug-out type, such as is best shown with respect to one portion of same in FIG. 6 wherein one of the two identical base wire portions 90 of the ultra-high-frequency antenna portion 30 is shown as effectively comprising a male prong mechanically and electrically plugged into and engaged within a corresponding electrically conductive female recess 92 carried within the upper end portion 44 of the antenna pole 40, and with said female electrically conductive receiver or socket portion 92 being electrically connected to one wire of the dual wire ultra high frequency antenna lead-in wires 88—it, of course, being understood that the other base wire 90 of the ultra-high-frequency antenna portion 30 is similarly plugged into and electrically connected with respect to a similar electrically conductive receiving socket connected to the other wire of said pair of ultra high frequency antenna lead-in wires 88. Both of said ultra-high-frequency antenna lead-in wires 88 then pass downwardly through the hollow interior 86 of the antenna pole 40 and egress out of the mounting base member 34 in a lateral direction in a manner similar to that previously described in connection with the very high frequency dual antenna lead-in wires 80, and are adapted to be connected in a similar manner to corresponding ultra-high-frequency antenna terminals of a conventional television receiver (not shown for the same reasons as detailed hereinbefore). Of course, it should be understood that the mode of connection of the ultra-high-frequency antenna portion 30 with respect to the ultra-high-frequency antenna lead-in wires 88 is not limited to the specific exemplary plug-in arrangement illustrated in the exemplary first form of the invention just described in detail, but may assume a variety of other forms employing various different types of electrical connectors and, if desired, the upper ends of the ultra-high-frequency antenna lead-in wires 88 may be soldered or otherwise electrically connected to either of the two wires 90 above the upper end 44 of the antenna pole 40 and may extend downwardly therefrom on the outside of the extreme upper part of the antenna pole 40 and may then enter the hollow interior 86 of the antenna pole portion 40 by way of the opening 84 thereinto, or various other functionally equivalent arrangements may be employed in lieu thereof.

FIGS. 7 and 8 illustrate a very slight modification of the invention, and, therefore, parts which are structurally or functionally identical to or similar to corresponding parts of the first form of the invention are designated by similar reference numerals, followed by the letter "*c*", however. In the modification of FIGS. 7 and 8, the mounting means, indicated generally at 32*c*, takes the form of a mounting bracket having an upper flat surface portion 38*c* and having engaging means indicated generally at 73*c*, including the male threads 72*c* at the bottom end of the pole portion 40*c* threadedly engaged within a corresponding exteriorly threaded coupling member 94 which is fastened to the flat surface portion 38*c* of the mounting bracket 32*c* by upper and lower threaded nut means 96 and the compressible lock washer 97, thus providing a firm, rigid attachment of the pole portion 40*c* of the antenna-carrying framework means, indicated generally at 20*c* to the bracket 32*c*.

It should be noted that the mounting bracket 32*c* in the example illustrated in FIGS. 7 and 8 is a right angle bracket having an attachment portion 98 provided with attachment means which, in the example illustrated, comprise threaded fastener means 100, although not specifically so limited, adapted to attach same with respect to an auxiliary supporting object, such as the vertical surface portion 102 of a television set or other auxiliary supporting object which is fragmentarily and generally designated by the reference numeral 104 in FIGS. 7 and 8. However, the mounting bracket 32*c* may assume may desired configuration appropriate for attachment to any desired type of supporting object in any desired orientation.

FIG. 9 fragmentarily illustrates a further modification of the invention and, therefore, parts thereof which are structurally or functionally substantially identical or similar to corresponding parts of previously described forms of the invention are designated by similar reference numerals, followed by the letter "*d*", however. In the FIG. 9 modification, the mounting means, generally designated by the reference numeral

32*d*, comprises an interiorly threaded coupling member 94*d*, similar to that shown at 94 in the modification of FIGS. 7 and 8 and threaded onto the exteriorly threaded lower end 72*d* of the pole portion 40*d*, and having its interiorly threaded bottom end 106 threaded onto the exteriorly threaded fineal-mounting member 108 of a conventional lamp-shade-supporting harp means 38*d*. Thus, it will be understood that all that is necessary to do in order to mount the antenna pole 40*d* on a lamp such as is designated fragmentarily by the reference numeral 104*d*, is to remove the fineal (not shown) from the threaded fineal-mounting member 108 at the top of the lamp-shade-mounting harp means 38*d*, and to then replace the previously removed fineal with the lower end of the antenna pole 40*d* by threading same thereonto in the manner clearly shown in FIG. 9. Of course, normally, the lamp shade would still be positioned over the lamp-shade-mounting harp means 38*d* and laterally encompassing the light bulb 110 in a conventional manner. This is not shown in FIG. 9 for reasons of drawing simplification and clarification. The two sets of very high frequency and ultra-high-frequency antenna lead-in wires 80*d* and 88*d* can then be extended to a near-by, or remote, television set (not shown) and connected to the corresponding conventional very high frequency antenna terminals and ultra-high-frequency antenna terminals. This arrangement makes it possible to mount the entire antenna means on top of a television lamp, a floor lamp, a table lamp, or any other lamp positioned adjacent to a television set. Incidentally, it should be noted that it is also possible for the bottom of the antenna pole 40d to be mounted on a reversed type of fineal-mounting structure 108 from that shown in FIG. 9 wherein it is shown as being exteriorly threaded. In other words, said fineal-mounting member 108 may be interiorly threaded and, in this case, may directly receive the exteriorly threaded bottom portion 72*d* of the pole portion 40*d* of the antenna-carrying framework means, and the coupling member 94*d* may be eliminated since it was merely provided in the FIG. 9 form of the invention to make it possible to couple the exteriorly threaded bottom end 72*d* to the exteriorly threaded fineal-mounting member 108, which could not be done without the provision of such a coupling member 94*d*. Indeed, such adaptations as exemplified by the adaptation just described above can be employed in any or all of the various different forms of the invention within the broad scope thereof since such comprise minor structural variations fully equivalent to each other.

FIG. 12 fragmentarily illustrates a further modification of the invention essentially the same as the modification illustrated in FIGS. 7 and 8, with the exception of the fact that the flat surface 38*e* to which the threaded fasteners 96*e* clamp the bottom of the antenna pole 40*e*, may actually comprise the top surface of a television receiver, or of a conventional antenna-mounting portion thereof where the conventional rabbit ear portable antenna member is conventionally located. In this modification, all parts similar to those of FIGS. 7 and 8 are designated by similar reference numerals, followed by the letter "*e*", however. In other words, the FIG. 12 modification primarily illustrates an arrangement where the conventional "rabbit ear" antenna provided on many television sets is removed and the antenna pole 40*e* of the present invention is mounted in place thereon by a mounting structure substantially the same as that shown in FIGS. 7 and 8 although without the bracket shown therein.

FIG. 13 is another slight modification of the mounting means which, in this case, is generally designated by the reference numeral 32*f*. Indeed, all parts of this modification which are structurally or functionally substantially identical or similar to those of the previously described forms of the invention are designated by similar reference numerals, followed by the letter "*f*", however. In this modification, it will be noted that the mounting means 32*f* again comprises a first portion 94*f* which may be interiorly threaded or merely clamped so as to engage the exteriorly threaded lower end 72*f* of the pole portion 40*f* of the antenna-carrying framework means, and said coupling or sleeve portion 94*f* is firmly connected to a bracket attachment portion 98*f* similar to that shown at 98 in FIG. 7 which is adapted to be fastened by attachment means, such as threaded attachment means or the like 100*f* to a vertical supporting surface such as that shown at 102*f* of any desired auxiliary supporting structure.

FIG. 14 illustrates a further slight modification of the invention and parts which are structurally or functionally similar to corresponding parts of previously described forms of the invention are designated by similar reference numerals, followed by the letter "*g*", however. In this modification, the mounting means indicated generally at 32*g* comprises laterally offset and angularly related coupling means, indicated generally at 94*g*, including a first portion 74*g* which is interiorly threaded and effectively comprises a part of threaded engaging means functionally equivalent to the interior threads 74 of the mounting base member 34 of the first form of the invention. Said angularly related coupling means 94*g* also includes a second, laterally angularly offset clamp part 112 integrally connected to the interiorly threaded engaging nut 74*g* and provided with a tightening key 114 adapted to make it possible to tighten the clamp 112 around a corresponding portion of a vertically directed pole 104*g* of a pole lamp means whereby to firmly support the antenna pole 40*g* in a laterally displaced and angularly related position with respect to the auxiliary supporting means 104*g* comprising the vertically directed pole of a pole lamp means. The arrangement of FIG. 14 makes it possible to mount the complete antenna means at any desired location on any portion of any vertically directed pole lamp situated near a television receiver.

Thus, it will be seen that I have provided an arrangement which is extremely adaptable as to the type of auxiliary supporting object adapted to carry the antenna means and which is extremely adaptable with respect to repositioning adjustment of the various antenna portions so as to provide for optimum reception of both very high frequency television signals and/or ultra-high-frequency television signals at virtually any locations — even in so-called fringe areas where television signal reception is conventionally very poor.

Incidentally, it should be noted that not only is it possible to interchange the very high frequency antenna portions, but to interchange the type of ultra-high-frequency antenna portions 30 and that it is possible to physically reposition the ultra-high-frequency antenna

portion 30 by twisting same at the location of the two mounting portions 90. This type of adjustment requires actually deflecting the wires thereof at approximately the location generally designated by the upper reference numeral 28A in FIG. 1 to a certain extent. However, it should be noted that if desired, a pivot means similar to either of those shown at 24 in either portion of the cross arm member 42 may be positioned between the upper end 44 of the antenna pole 40 and the remainder thereof to allow the ultra-high-frequency antenna portion 30 to be readily rotated around a vertical axis to any desired degree. Also, it should be noted that similar rotation may be effected at the lower locations indicated generally by the reference numeral 28B by merely repositioning the threaded portions 72 and 74, or the entire base member 34 may be rotatably repositioned. Additionally, it should be noted that optionally the ultra-high-frequency antenna portion 30 may be provided with additional physical-position-adjustment means, such as indicated by the reference numeral 28A, effectively pivotally interconnecting upper outwardly directed portions of the base wires 90 relative to lower inwardly directed portions of the upwardly directed loop part of the ultra-high-frequency antenna portions 30 in a manner which may be said to effectively comprise pivot means operable for pivoting said upper loop part of the ultra-high-frequency antenna 30 around a horizontal axis in the manner most clearly shown by the double-headed arrow 91 of FIG. 2 wherein two alternate pivoted positions of said loop part of the ultra-high-frequency antenna 30 are shown in phantom lines.

It should further be noted that the type of connection of the antenna portions to the antenna lead-in wires may be modified from the specific exemplary arrangements illustrated in the figures of the drawing — and all within the broad scope of the present invention. Soldered connection may be employed if desired, or conventional electrical clip-on, screw-on, or other mechanical type connections may be employed, and all such arrangements are intended to be included and comprehended within the broad scope of the present invention. This is also true with respect to the mounting means and engaging means, which may be modified within the broad scope and teachings of the present invention to provide functionally equivalent mounting arrangements.

It should be noted that while certain exemplary forms of the invention have been illustrated wherein the very high frequency antenna means 20 includes two portions 26 and the ultra-high-frequency antenna means 30 includes a single portion, the invention is not specifically so limited. Actually, either of said antenna means may include one portion or any desired number of antenna portions which may be positioned in a variety of different locations. If desired, in certain cases the ultra-high-frequency antenna means (either in one portion or a plurality of portions) may be carried by the cross bar means, either in addition to, or in lieu of, the very high frequency antenna means portions which may also be differently positioned and which may vary in number. Also, it should be noted that the length, as well as the shape, of any of the various different parts of the antenna portions may be modified and neither is to be construed as specifically limiting the invention to the exemplary arrangements illustrated. Additionally, it should be noted that the entire antenna-mounting device can be positioned relatively near to a television set to which the lead-in wires are adapted to be connected or can be located remotely therefrom — the limitation being merely that which is provided by the length of the antenna lead-in wires, which, if excessive, can be especially shielded in order to minimize any possibility of extraneous pick-up.

It should be understood that the figures and the specific description thereof set forth in this application are for the purpose of illustrating the present invention and are not to be construed as limiting the present invention to the precise and detailed specific structure shown in the figures and specifically described hereinbefore. Rather, the real invention is intended to include substantially equivalent constructions embodying the basic teachings and inventive concept of the present invention.

I claim:

1. An antenna mounting structure adapted to interchangeably engage and be supported by an auxiliary supporting structure of any of a plurality of different types, comprising: antenna-carrying framework means provided with and removably interchangeably carrying antenna means of at least one type, including at least two antenna means portions, in an electrically isolated and insulated manner relative to the antenna-carrying framework means, said antenna-carrying framework means having physically spaced separate antenna-carrying portions thereof carrying corresponding antenna portions of said antenna means and being provided with physical-position-adjustment means for selective adjustment of the physical position of said corresponding antenna portions of said antenna means carried thereby for optimizing the receptivity coupling thereof with respect to a corresponding electromagnetic field adapted to be received thereby; said antenna-carrying framework means being provided with engaging and mounting means adapted to be effectively engaged with respect to an auxiliary supporting means for supporting the entire antenna-carrying framework means and the antenna means carried thereby in a selected relationship with respect to such an auxiliary supporting means; said antenna-carrying framework means being of substantially cruciform shape and including a substantially vertically directed pole portion and a substantially transversely directed cross arm portion, said antenna-carrying portions of said antenna-carrying framework means comprising separate portions at outer ends of said cross arm portion and a top part of said pole portion; said physical-position-adjustment means comprising pivot means providing for relative pivotal movement of each of said physically spaced, separate antenna-carrying portions at outer ends of said cross arm portion around a selected axis substantially perpendicular to said substantially transversely directed cross arm portions of said antenna-carrying framework means; said antenna-carrying portions independently pivotally carried by outer ends of said cross arm portion of said antenna-carrying framework means being provided with electrically conductive coupling cap means and antenna lead-in wire connecting means for exteriorly mounting said corresponding antenna portions therearound in a manner electrically con-

nected with respect thereto and for correspondingly engaging corresponding ones of a pair of antenna lead-in wires.

2. Apparatus as defined in claim 1, wherein said antenna pole portion is hollow and is provided with said antenna lead-in wires therewithin from the connections thereof with respect to said separate antenna portions, said antenna lead-in wires extending along the hollow interior of said antenna pole portion toward said engaging and mounting means for egress and connection to corresponding antenna terminals of a television receiver.

3. An antenna mounting structure adapted to interchangeably engage and be supported by an auxiliary supporting structure of any of a plurality of different types, comprising: antenna-carrying framework means provided with and removably interchangeably carrying antenna means of at least one type, including at least two antenna means portions, in an electrically isolated and insulated manner relative to the antenna-carrying framework means, said antenna-carrying framework means having physically spaced separate antenna-carrying portions thereof carrying corresponding antenna portions of said antenna means and being provided with physical-position-adjustment means for selective adjustment of the physical position of said corresponding antenna portions of said antenna means carried thereby for optimizing the receptivity coupling thereof with respect to a corresponding electromagnetic field adapted to be received thereby; said antenna-carrying framework means being provided with engaging and mounting means adapted to be effectively engaged with respect to an auxiliary supporting means for supporting the entire antenna-carrying framework means and the antenna means carried thereby in a selected relationship with respect to such an auxiliary supporting means; said antenna-carrying framework means being of substantially cruciform shape and including a substantially vertically directed pole portion and a substantially transversely directed cross arm portion, said antenna-carrying portions of said antenna-carrying framework means comprising separate portions at outer ends of said cross arm portion and a top part of said pole portion; said physical-position-adjustment means comprising at least a pair of mutually perpendicular pivot means providing for two corresponding different types of pivotal movement around two correspondingly mutually perpendicular pivot axes of the corresponding antenna-carrying portions with respect to the remainder of said antenna-carrying framework means, with one of said pivot means comprising a pair of substantially transversely spaced pivots, each providing for relative pivotal movement of the corresponding one of said physically spaced, antenna-carrying portions of said framework means at outer ends of said cross arm portion around an axis perpendicular thereto and relative to the corresponding adjacent part of said cross arm portion; said two spaced, pivotally mounted, antenna-carrying portions independently pivotally carried by outer ends of said cross arm portion of said antenna-carrying framework means being provided with a pair of substantially cylindrical, slip-over, electrically conductive, coupling cap means slipped-over and carried by each outer terminus of said two spaced, pivotally mounted antenna-carrying portions and antenna lead-in wire connecting means for exteriorly mounting said corresponding antenna portions therearound in a manner electrically connected with respect thereto and for correspondingly engaging corresponding ones of a pair of antenna lead-in wires.

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