Oct. 31, 1950

C. A. TROWBRIDGE

ANTENNA CONSTRUCTION

2,528,400

Filed April 5, 1949

4 Sheets-Sheet 1

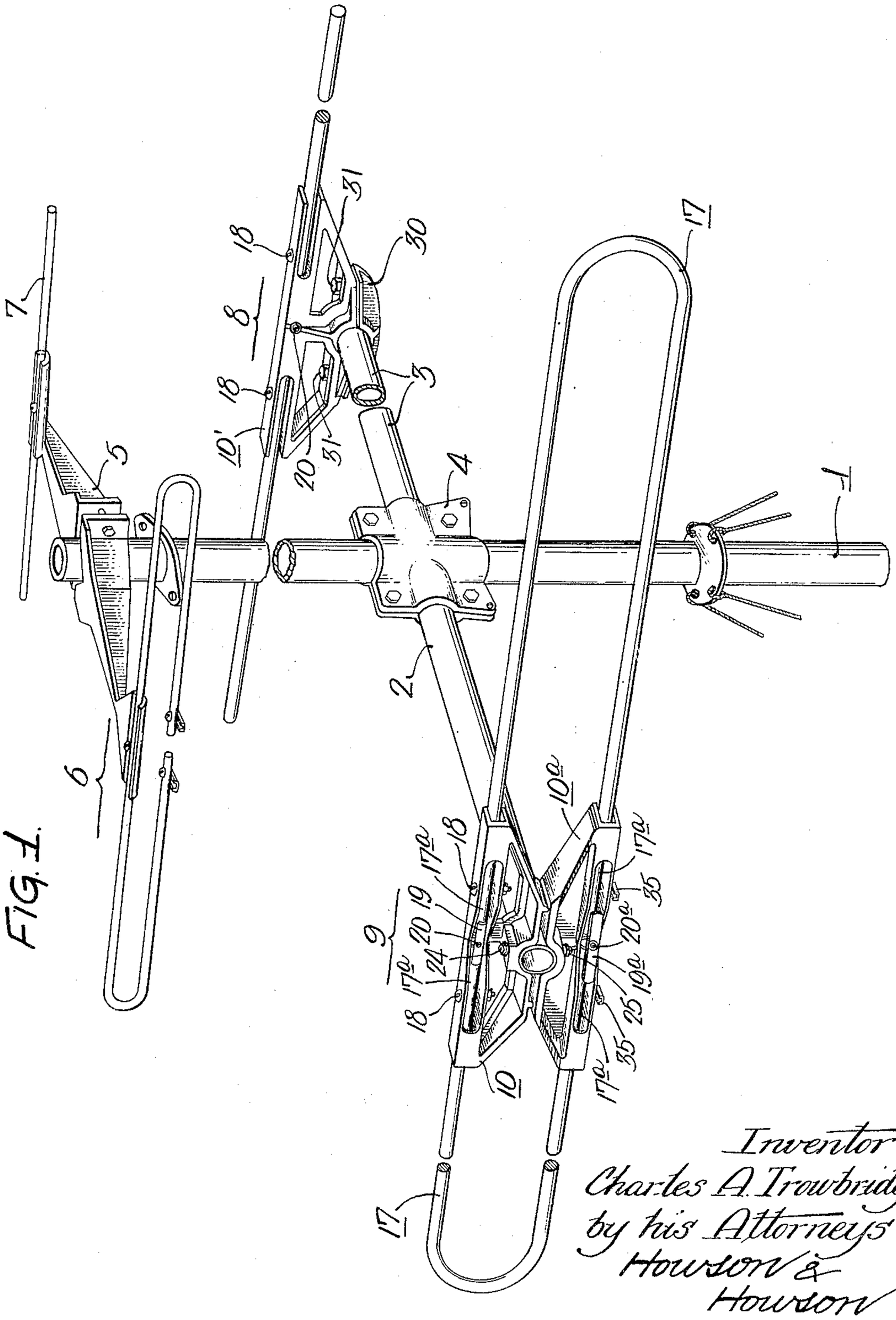

FIG. 1.

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FIG. 2

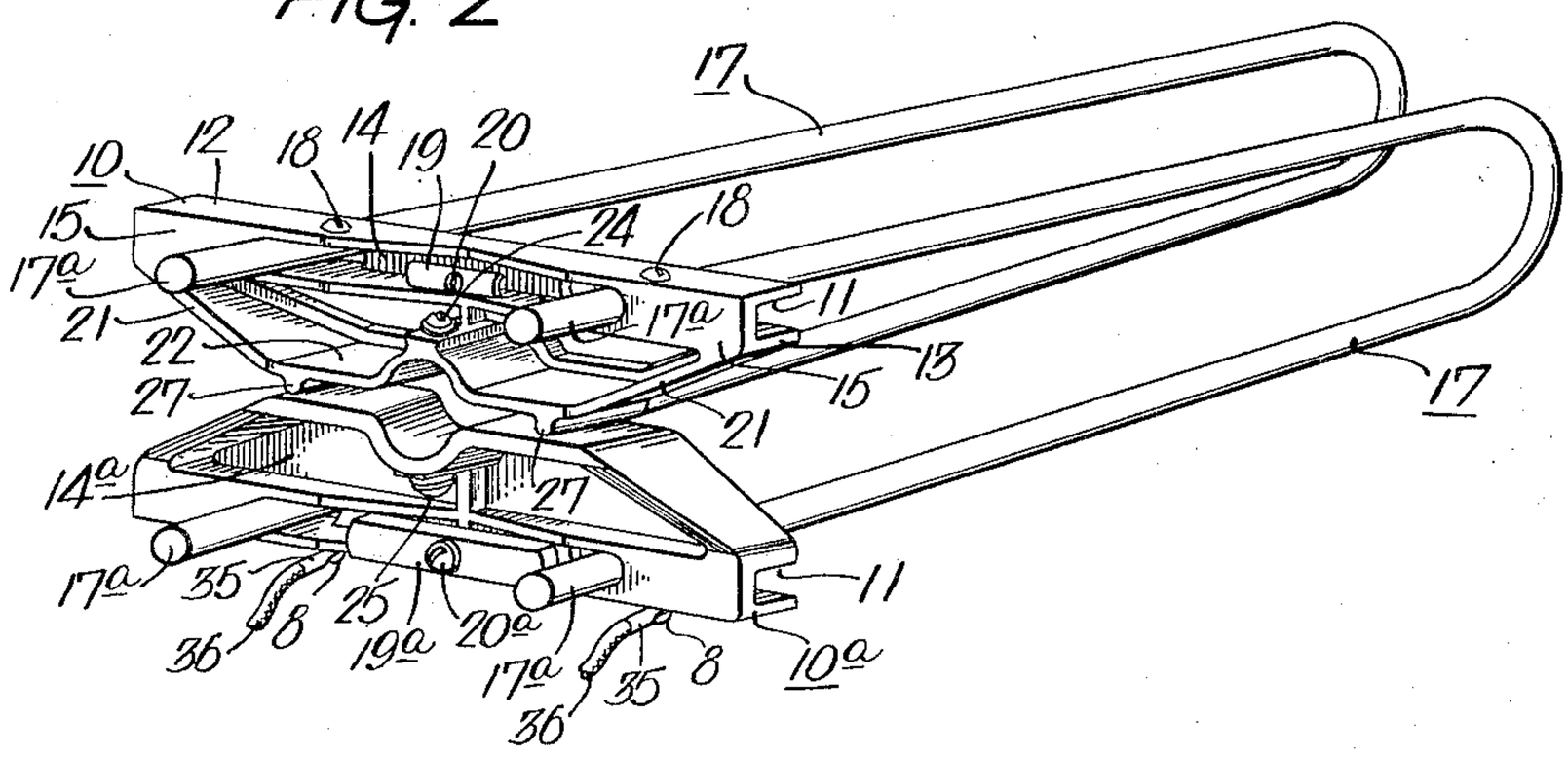

FIG. 3.

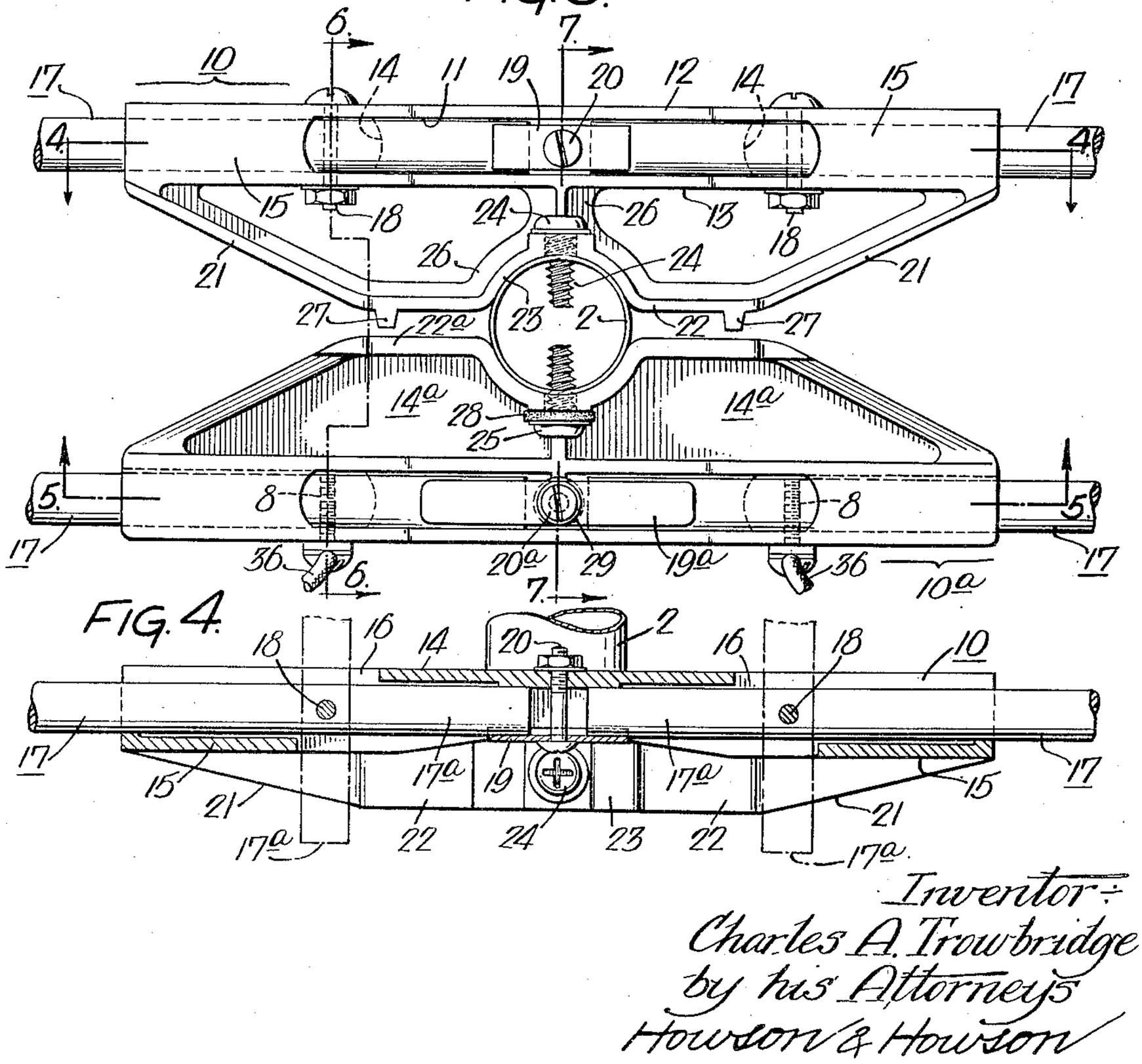

FIG. 4.

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FIG. 5

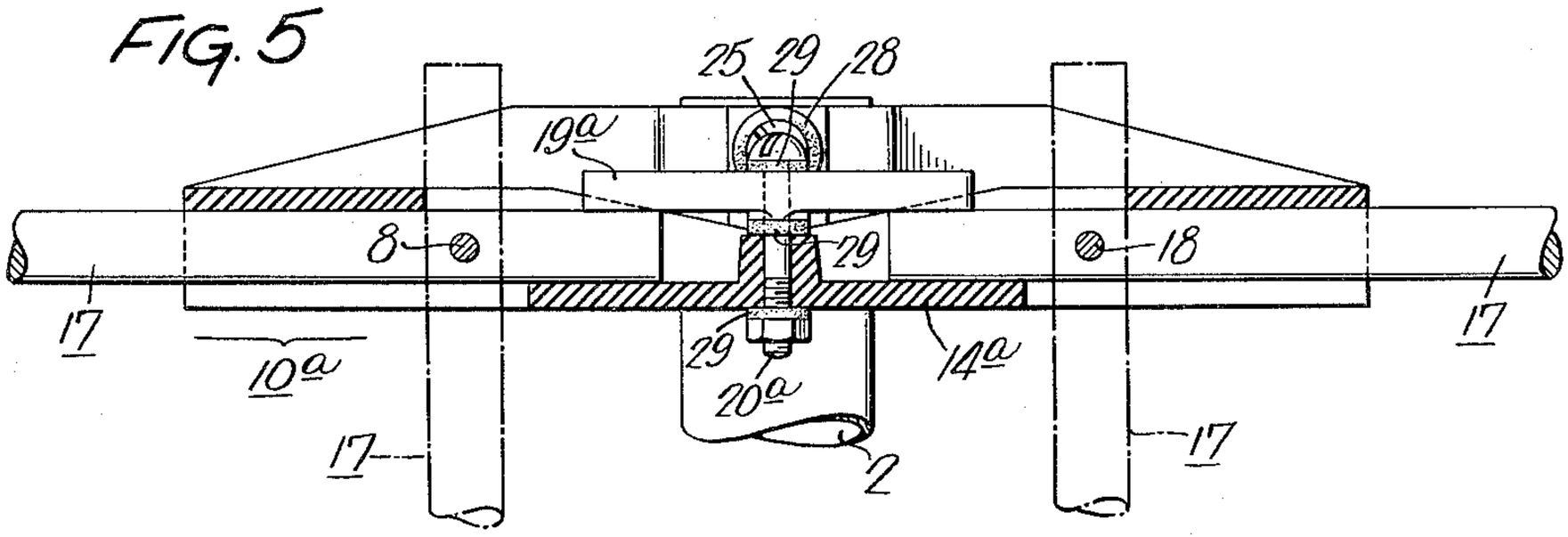

FIG. 6.

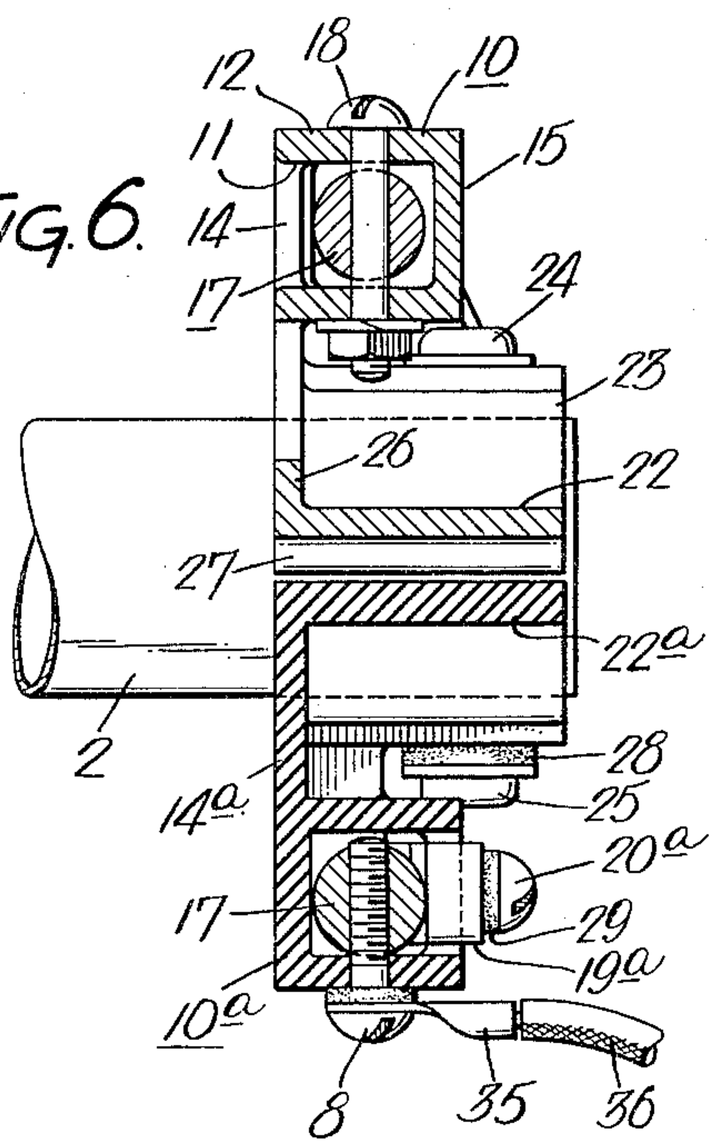

FIG. 7.

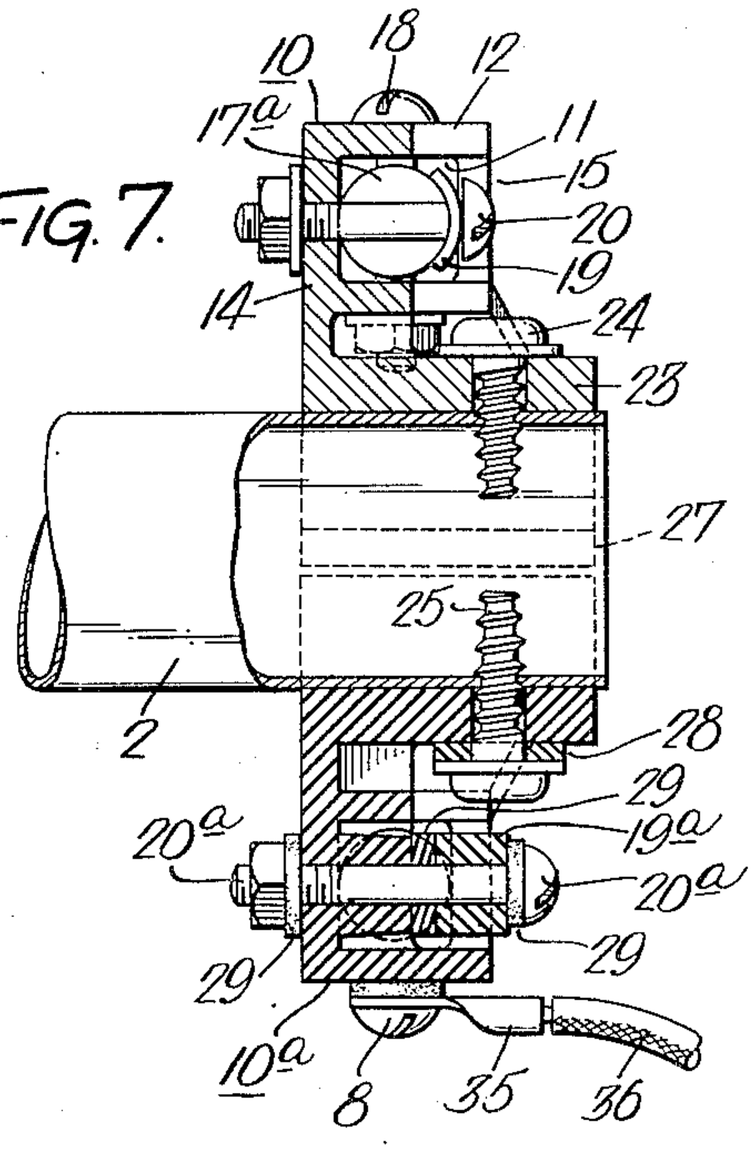

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FIG. 8.

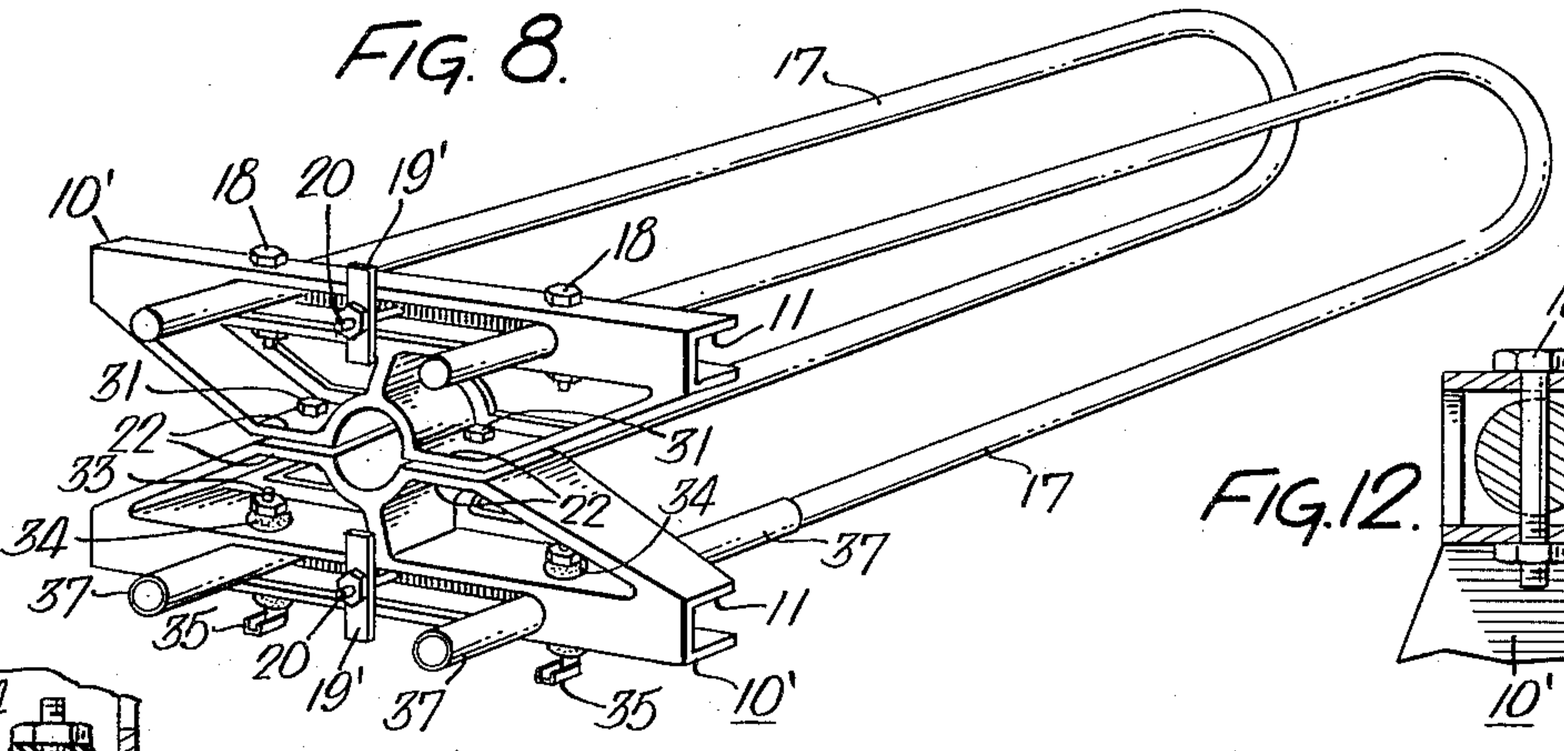


FIG. 12.

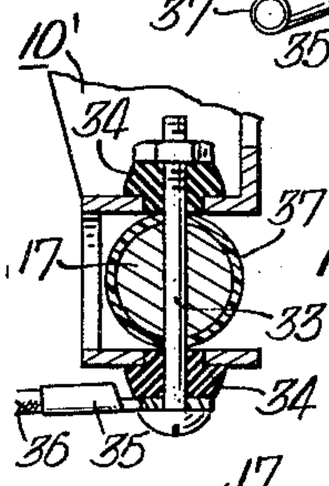


FIG. 11.

FIG. 9.

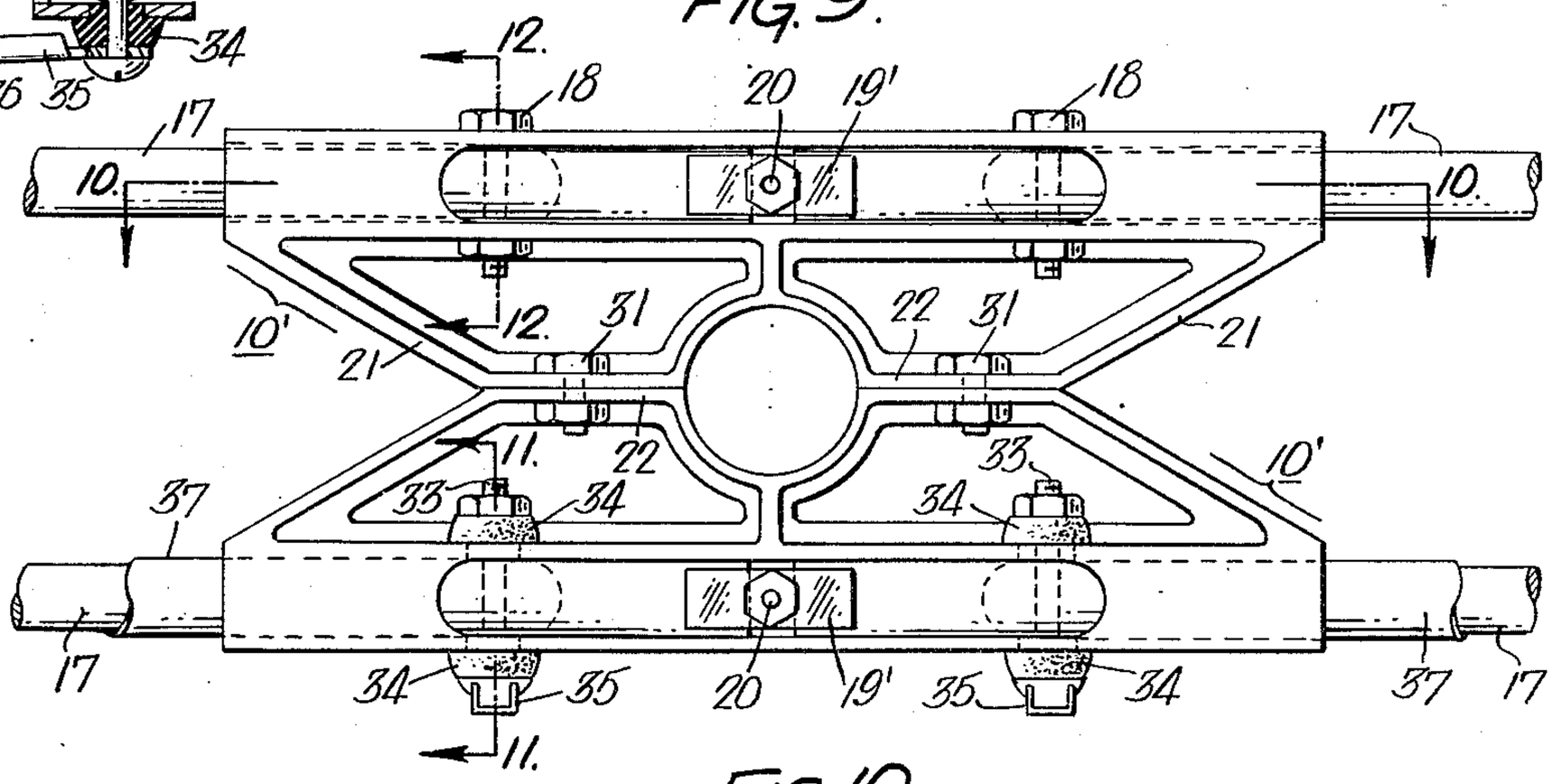
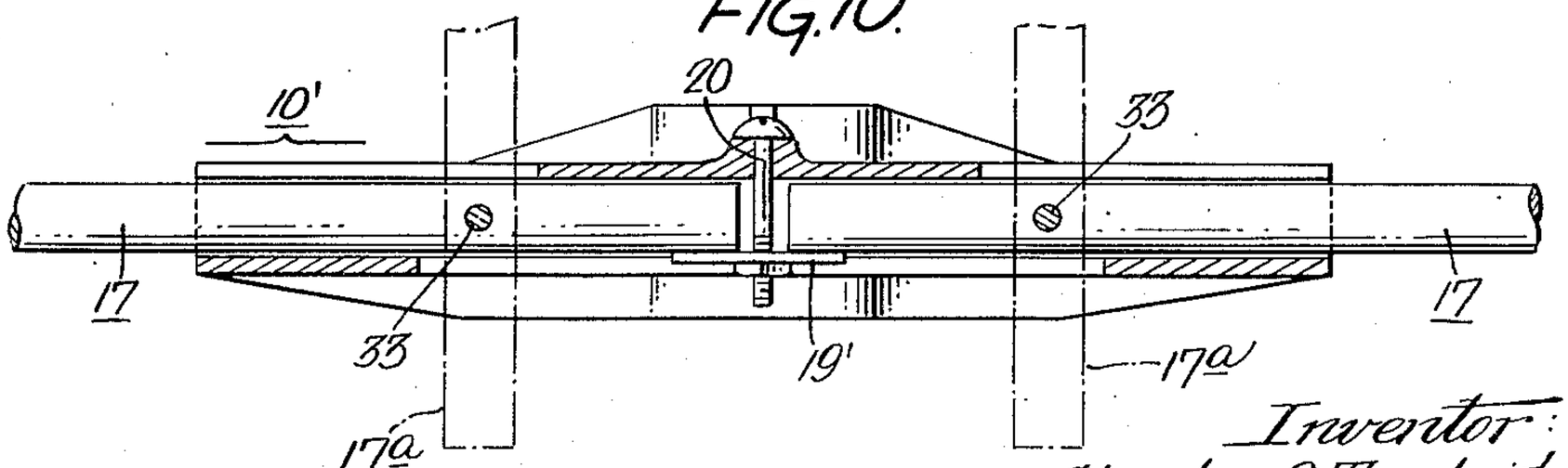


FIG. 10.



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UNITED STATES PATENT OFFICE

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ANTENNA CONSTRUCTION

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Application April 5, 1949, Serial No. 85,635

6 Claims. (Cl. 250—33)

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This invention relates to mounting structure for antenna, and more particularly to an improved mount for a dipole type of antenna such as is commonly used in television and radio.

The large demand for radio and television installations employing the conventional dipole antenna requires that these devices be capable of quick, efficient installation by those relatively inexperienced in work of this sort, and also it is important that the construction of the antenna assembly be made so that it can be shipped and stored in a folded condition and of such a size that it may be packaged in cartons or boxes of convenient shipping dimensions.

It is also desirable that the antenna arrays be assembled to the greatest possible extent before shipment, so that it is not necessary to supply loose bolts, nuts, washers or other small parts which may become lost or which may not be correctly installed. This is of particular significance when it is realized that one side of the dipole itself must be properly insulated, thus in some cases requiring the use of small nonconductive washers. In the event that these washers are not assembled in the correct places, the antenna will be inoperative.

It is therefore a primary object of the invention to provide a mounting structure for antenna aerials of the dipole variety, which permits shipping of the assembly in a folded condition and which avoids the necessity of supplying separate small parts.

A further object of the invention is to provide a mounting structure for antenna assemblies which enables swiveling of the dipole members in the mounting brackets over an arc of approximately 90° and which permits the dipoles to be swiveled from an operative to an inoperative position and vice versa merely by loosening a clamping member in the mounting.

A further object of the invention is to provide a sturdy mounting bracket for dipole antennas in which the dipole is pivotally mounted in the bracket and which also has a channel defined by oppositely facing walls so that the dipole may be securely clamped against the side walls when in the operative position.

A still further object of the invention is to provide a metallic mounting bracket for dipole antennas which has suitable insulation for one end of the dipole, the insulating devices capable of being retained in place when the dipole is folded for shipment.

Further objects will be apparent from the specification and drawings in which:

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Fig. 1 is a perspective showing an antenna array utilizing the construction of the present invention;

Fig. 2 is a perspective of one dipole assembly of the antenna array of Fig. 1, in a folded position;

Fig. 3 is an enlarged detail of the U-shaped dipole assembly shown in Fig. 1;

Fig. 4 is a sectional detail as seen at 4—4 of Fig. 3;

Fig. 5 is a sectional detail as seen at 5—5 of Fig. 3;

Fig. 6 is an enlarged sectional detail as seen at 6—6 of Fig. 3;

Fig. 7 is an enlarged sectional detail as seen at 7—7 of Fig. 3;

Fig. 8 is a perspective similar to Fig. 2, but showing a modified form;

Fig. 9 is a fragmentary end view of the structure of Fig. 8, showing the dipoles in a clamped or operative position;

Fig. 10 is a fragmentary sectional view as seen at 10—10 of Fig. 9;

Fig. 11 is a sectional detail as seen at 11—11 of Fig. 9; and

Fig. 12 is a sectional detail as seen at 12—12 of Fig. 9.

The invention comprises essentially the provision of a bracket having a slot or channel extending lengthwise of the bracket, and oppositely facing vertical walls for the slot so arranged that the center portion of the slot is provided with a wall on one vertical side thereof, together with top and bottom walls, whereas the end portions of the slot have juxtaposed side walls. A clear through aperture is provided at the inner termini of the outer vertical walls and the outer termini of the inner wall so that a dipole antenna which is conventionally formed of a length of metallic tubing may be pivoted substantially in the center of said aperture. When the dipole is pivoted to one extreme position, the tubing abuts the concave ends of the vertical walls to prevent further pivoting. In the other extreme position, which is that in which the antenna is used, the dipole tubing is pivoted so that the sides of the tubing abut the vertical sides of the juxtaposed channel walls. A longitudinal clamp serves to retain the dipole tubing in a permanent fixed position and the clamp may be tightened or loosened by means of a conventional nut and bolt. The mounting bracket is also provided with a concave transverse depression adapted either to be clamped around the cross arm of the mast assembly, or to be screwed directly thereto.

In the one form of the invention, the brackets are intended to be used in pairs with a U-shaped dipole and in this case it is necessary that one of the brackets be made of, or be provided with, suitable non-conducting material. I have found that is is desirable to construct one bracket entirely of an insulating material such as bakelite or other synthetic plastic. In this case, the upper and lower brackets may be similar in shape, the only substantial difference being in the material itself. In the event that both brackets are of a conductive material, it then becomes necessary to provide other insulating means and suitable shoulder washers may be provided for the pivot bolts in the lower bracket. However, the brackets are so designed that they may also be used with a straight dipole as well as the U-shaped form.

A conventional television antenna array, as shown in Fig. 1, has a mast 1 which supports cross arms 2 and 3 by means of a clamp 4 and an adapter having a cross arm 5 and dipoles 6 and 7. Cross arm 3 supports a reflector dipole 8 of the straight variety and cross arm 2 supports a folded or U-shaped dipole assembly 9. The present invention is not concerned with the masts, cross arms or dipoles in themselves but provides an improved bracket which is extremely versatile when used in conjunction with an array of the form shown in Fig. 1.

An antenna bracket 10 constructed in accordance with the invention, may be of an aluminum casting or other lightweight metal and is provided with a longitudinal groove or channel 11 formed by a top wall 12 and a bottom wall 13. Walls 12 and 13 extend substantially the length of bracket 10 and are connected by means of a vertical wall 14 across the center portion of the bracket and a pair of vertical end walls 15, 15 which extend along the outer ends of the bracket. As seen more clearly in Fig. 4, walls 14 and 15 terminate sufficiently short of each other to provide a pair of transverse apertures 16, 16 in which the dipoles 17, 17 are pivotally mounted by means of bolts 18, 18. The ends 17*a*, 17*a* of dipole 17 extend through apertures 16, 16 a sufficient distance so that the ends 17*a*, 17*a* abut the inside of wall 14 when the dipole is pivoted to the operative position, as shown in Fig. 1. In this position, the ends 17*a*, 17*a* of the dipoles may be securely clamped to the bracket 10 by means of a plate 19 and bolt 20 which extends through the center of wall 14.

The remainder of bracket 10 comprises a pair of webs 21, 21 which extend in biased spaced relation to the groove 11 and which are connected by means of a parallel web 22. Web 22 is provided with a concave substantially semi-cylindrical groove 23 adapted to receive cross arm 2 and to which the bracket 10 is secured by means of sheet metal screws 24, 25. Web 22 may also extend to the bottom wall 13 of groove 11 by means of a vertical web 26. If desired, web 22 may be provided with spacing lugs 27, 27 to insure proper relative location of the bracket members on cross arm 2, in the event that the brackets are installed in pairs, as shown in Figs. 1 and 2.

In the illustration of Fig. 2, the upper bracket member 10 is constructed of an electrically conductive material such as aluminum, whereas the lower bracket 10*a* is formed of a non-electrically conductive material such as bakelite. Brackets 10 and 10*a* are substantially identical in general construction except that the central vertical wall 14*a* of bracket 10*a* extends to web 22*a* to provide a more rigid construction and to facilitate the molding operation. Also, in order to reduce the possibility of cracking the plastic material, the sheet metal screw 25 holding bracket 10*a* may be provided with a leather or semi-resilient washer 28 as may also bolts 8, 8 in bracket 10*a*. Plate 19*a* used on bracket 10*a* is likewise constructed of a non-electrically conductive material and bolt 20*a* is insulated therefrom by means of fiber washers 29, 29.

I have found that extremely satisfactory results can be obtained with the metal bracket used in conjunction with the bakelite bracket, as described hereinbefore. However, in the event that it may be desired to employ two metal brackets, Figs. 8–12 illustrate how this may be done. Bracket 10′ is substantially identical to bracket 10 except that the method of clamping the bracket to the cross arm 2 is slightly modified. A bracket such as 10′ is used in pairs or with a clamping collar 30 since the sheet metal screws 24, 25 are replaced with bolts 31, 31 which clamp the brackets 10′, 10′ together through their oppositely facing webs 22, 22. The lower bracket 10′ in Fig. 8 is provided with pivot bolts 33, 33 which are insulated from the bracket by means of two fiber shoulder washers 34 on each bolt 33. Bolts 33 as well as bolts 8, may be provided with electrical clips 35 to which the lead-in wires 36, 36 may be attached. In the form of Fig. 8, the clamping plates 19′ may both be of metal if desired, since the lower arms of the dipole are completely insulated by means of sheaths 37, 37.

The bracket shown in Figs. 2 and 3 employing sheet metal screw 24, has the advantage that it may be used individually for a straight dipole without the necessity of providing a clamping collar. Fig. 1 shows a straight dipole employing the single bracket of the modified form of Fig. 8, which in this event employs the collar 30 to secure it onto cross arm 3.

I have thus provided a mounting bracket for antennas which is extremely simple to fabricate and which permits the dipole of the antenna to be folded for shipment and storage without being disconnected from the bracket. This construction permits total assembly of the units before shipping from the factory, and means that the installation mechanic or owner has merely to turn plates 19 and 19*a* or 19′ to the vertical position shown in Fig. 8, pivot the dipoles to the operative position, turn the plates to the horizontal position shown in Figs. 2 and 3, and tighten the bolts 20 to render the bracket and dipoles ready for installation. This avoids all possibility that the dipole assembly may be incorrectly installed and insures proper insulation at the same time.

Having thus described my invention, I claim:

1. A mounting bracket for dipole antennas having a longitudinal channel defined by a bottom wall, a center vertical side wall of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side wall to provide a pair of transverse apertures through the channel, means for mounting said bracket to an antenna cross arm, and clamping means for securing a dipole antenna longitudinally in the channel.

2. A mounting bracket in accordance with claim 1, fabricated of a synthetic plastic material.

3. A mounting bracket for dipole antennas having a longitudinal channel defined by a bot-

tom wall, a center vertical side wall of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side wall to provide a pair of transverse apertures through the channel, pivot means in said apertures for swiveling a dipole, means for mounting said bracket to an antenna cross arm, and clamping means for securing the dipole longitudinally in the channel.

4. A mounting bracket for dipole antennas having a longitudinal channel defined by a bottom wall, a center vertical side wall of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side wall to provide a pair of transverse apertures through the channel, pivot means in said apertures for swiveling a dipole, means for mounting said bracket to an antenna cross arm, clamping means for securing the dipole longitudinally in the channel, a parallel web rigidly attached to the bottom wall of the channel, and a pair of spacing lugs on the bottom of said web.

5. A mounting bracket assembly for U-shaped dipole antennas comprising a metallic bracket having a longitudinal channel defined by a bottom wall, a center vertical side wall of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side wall to provide a pair of transverse apertures through the channel, pivot means in said apertures for swiveling a dipole, a non-electrically conductive bracket comprising a longitudinal channel defined by a bottom wall, a center vertical side wali of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side

wall to provide a pair of transverse apertures through the channel, pivot means in said apertures for swiveling a dipole, clamping means in both brackets for securing the dipole longitudinally in the channels of each bracket, and means for mounting both of said brackets to an antenna cross arm so that the channels in each bracket are substantially parallel to each other and in the same vertical plane.

6. A mounting bracket for U-shaped dipole antennas comprising a first metallic mounting bracket having a longitudinal channel defined by a bottom wall, a center vertical wall of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side wall to provide a pair of transverse apertures through the channel, pivot means in said apertures for swiveling a dipole, a second metallic bracket having a longitudinal channel defined by a bottom wall, a center vertical side wall of substantially shorter length than the bottom wall, a pair of juxtaposed vertical side walls at each end of the channel, the inner termini of the last-named side walls being in spaced longitudinal relation with the termini of the center side wall to provide a pair of transverse apertures through the channel, pivot means in said apertures for swiveling a dipole, means for insulating said second bracket and pivot means from the dipole, and means for mounting said first and second brackets to an antenna cross arm so that the channels in each bracket are substantially parallel to each other and in the same vertical plane.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,558,114	Morison	Oct. 20, 1925
2,465,331	Resnick	Mar. 22, 1949