This invention relates broadly to rotateable apparatus, and in its specific phases to a new and improved means for mechanically adjusting a rotating television antenna for reception from stations located in various directions from the locality in which the set is situated.

It is customary to mount a rotateable antenna either on the top of a suitable mast extending to the ground or building upon which same is mounted or upon a suitable antenna-carrying mast mounted, in turn, upon and at one side of a fixed supporting mast at the exterior of a dwelling or the like, the rotateable mast being secured in fixed position after aiming of the antenna in any desired direction. This will permit reception from one or more stations in the general direction toward which the antenna is aimed, but in order to better receive programs from stations located in other directions the antenna mast must be rotate to other suitable positions. Such an adjustment requires a complex electro mechanical apparatus, or if a mechanical rotation is resorted to, this requires one or more persons at the exterior of the house or other building to make the directional adjustment and another person watching the set to determine when the best reception has been attained.

While adjusters have been devised for effecting rotate door antenna adjustments from the interior of a building, these are rather costly and not entirely successful and are therefore rather infrequently used. It was a recognition of this problem and a knowledge of the shortcomings of the present apparatus aimed at this problem, which led to the conception and development of the present invention.

Accordingly among the objects of the present invention is the provision of an exceptionally simple and inexpensive adjusting means for this purpose, yet one which will be easy to operate and is highly effective. Another object of this invention is to provide a gear casing located at the lower end of the rotateable mast carrying the antenna, said casing containing gear wheel connected with this mast for rotate it; a drive shaft being provided for this gear and adapted to extend to the interior of the building and into a second gear casing for mounting on one of the building walls. Said second gear casing containing manually operable gearing for rotating the drive shaft, the last mentioned gearing being provided with a hand knob for actuating it.

Another object of the invention is to provide for utilizing the fixed mast as a support for the external gear casing.

Another object is to provide the external gear casing with a seat to engage the side of a fixed mast and to provide a clamp member cooperative with this seat in clamping said external casing to said fixed mast.

Yet another object is to provide for easily and adjustably coupling one of the gears in the external casing to the lower end of the rotateable mast.

A further object is to make novel provision for clamping the internal gear casing against a wall of the building and permitting weather-tight passage of the drive shaft from the external gear casing through said wall and into said internal casing.

A further object is to provide means for limiting the rotation of the antenna to one complete revolution so as to avoid undesirable winding of the lead-in wires around the antenna mast.

A still further object is to make novel provision at the interior of the building for showing the direction toward which the antenna is pointed.

Yet another object is to provide friction brake means for holding the adjusting means against movement under the influence of all except unusually strong winds, and to make other simple provision to prevent such unusually strong winds from causing maladjustment.

Still further objects and advantages of this invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the means herein after fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain means for carrying out the invention, such means illustrating, however, but one of various ways in which the principle of the invention may be used.

In the annexed drawings:

Figure 1 is a side elevation showing an assembly embodying the invention.

Figure 2 is an enlarged vertical sectional view taken on line 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is a horizontal sectional view taken on line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is an enlarged front elevation of the internal gear casing.

Figure 5 is an enlarged fragmentary sectional view better showing the elements at the lower end of the internal gear casing.

A fixed mast 10, Figure 1, is shown secured by brackets 11 to one wall 12 of a structure, such as a building, and extending somewhat into the ground as usual. The upper end portion of this fixed mast is provided with a side mounted bearing sleeve 13 through which the rotateable mast 14 of an antenna 15 extends.

At the lower end of the rotateable mast 14, a gear casing 16, Figure 2, is secured to the fixed mast 10 by clamping means 17. This casing contains two intermeshing bevel gears 18 and 19, the gear 18 being conventionally secured upon a short vertical shaft 20 which extends through a bearing 21 at the top of the casing 16. The upper end of the shaft 20 is provided with an upwardly open coupling socket 22 which receives the lower end of the rotateable mast 14, the socket and mast being secured against relative rotation, after initial setting, as will be hereinafter described, by any suitable means such as a set screw 23.

The gear 19, Figure 2, is secured on the inner end of a short horizontal shaft 24 which extends through a bearing 25 at one vertical side of the casing 16, and the outer end of said shaft 24 is connected by a universal joint 26 to an operating shaft 27. This shaft 27 extends into a second gear casing 28 secured against the inner side of the building wall 22. Within said inner casing 28, a relatively large gear 29 is conventionally secured to the shaft 27, such as by means of pin 30a, said gear being in mesh with a comparatively small pinion 30. This pinion is conventionally anchored on shaft 31, as by means of pin 30a, and such shaft extends through a bearing 32 and is provided with a hand knob 33.

The ratio of the pinion 30 and gear 29 is preferably about one-to-twelve to allow easy rotation of the mast 14 by turning of the knob 33; and the ratio of the gears 18 and 19 is preferably one-to-one, to cause one com-
plete revolution of the large gear 29 to effect one complete revolution of the mast 14. Large gear 29 is provided with stop means of conventional form limiting the rotation of same to substantially one revolution. FIG. 1. in form of same, as diagrammatically shown in Figure 4, consists of a plug 48 between teeth of gear 29, and which may be at any preselected point such as the "N" as shown. The gear 29 may carry equally spaced indicating means visible selectively through a viewing opening 34 in the front plate 28a of the casing 28, to show the direction in which the antenna is oriented. The indicating means is preferably constituted by conventional markings, for instance by the four letters N, S, E, and W representing the four main points of a compass. The initial adjustment of the assembly is easily accomplished, for instance, the antenna can be aimed in a predetermined direction, such as East, then gear 29 is adjusted so that the symbol "E" is centered on the viewing opening 34. Figure 4, gear casing front plate 28a can then be fastened in place with pinion 30 in mesh with gear 29 and the assembly is in full adjustment ready for use. Thus, to aim the antenna toward the South, for example, it is simply necessary to turn the knob 33 until the letter "S" is visible at the opening 34. Antenna aiming in other directions, even to marked spots for local TV stations may be effected with equal ease.

To prevent any normal wind from blowing the antenna from a position at which it has been set, friction brake means is associated with the pinion shaft 31, as best seen in Figure 5. A brake washer 35 surrounds this shaft 31 between the bearing 32 and the hub 33a of the knob 33; a thrust washer 36 surrounds said shaft 31 and abuts the pinion 30; and a spring washer 37 of conventional form is interposed between said thrust washer 36 and the front plate 28a of the casing 28. The spring washer 37 exerts endwise pressure on the shaft 31 to hold the brake washer 35 frictionally engaged with the bearing 32 and hub 33a. Therefore, the shaft 31 is frictionally held so that it cannot be turned under the influence of any normal wind pressure against the antenna. To prevent maladjustment of the antenna by wind pressure when wind of unusually high velocity is blowing, a set screw 38 is threaded through the lower end of the casing 28 to engage between teeth of the pinion 30.

In the preferred form of construction, the gear casing has a V-shaped seat 39, Figure 3, to engage one side of the lamp member 40 is provided to contact with the opposite side of this mast, and clamping screws 41 connect said clamp member with the seat 39, for firmly gripping said casing in place on said fixed mast.

The gear casing is preferably mounted as shown in Figure 2. A tubular bearing 42 is secured at 43 to the back wall 28c of the casing 28 and extends outwardly through wall 12, said bearing 42 receiving the operating shaft 27. At the outer end of the bearing 42 same is provided with a weather seal 44 and with a clamping nut 45. Tightening of this nut 45 not only holds the seal 44 tight against the clamp 27 of the casing 28 but also against said wall. As a precaution against rotation of this casing, however, the same screws which secure the casing front plate 28a in place, preferably extend beyond the back wall 28c of the casing into the wall 12. One of these screws is shown at 46 in Figure 2.

A similar arrangement is shown in Figures 2 and 3. As shown in Figure 2, a clamping member 40 is shown on the shaft 27 and abutting the outer end of the tubular bearing 42 to prevent this shaft from possibly shifting inwardly and allowing the gear 29 to drag on the casing front plate 28a, as such dragging would injure the direction indicating marking on said gear.

A similar arrangement is shown in Figure 3. As shown in Figures 2 and 3, this clamping member is provided with an indication to prevent the upper end of the gear shaft 27 from approaching the upper section of the gear casing 28. The bearing 21a of the upper section, serves to drain out any water which may enter the casing.

From the foregoing it will be seen that a novel and advantageous construction for mounting and adjusting a television antenna has been provided, and is adapted for retaining the desired position. However, attention is invited to the possibility of making variations within the spirit and scope of the invention as herein shown and described. Moreover, it is to be understood that directional terms such as "front," "back," "upper," "lower," "upwardly," "vertical," et cetera, have been used to facilitate describing the invention and are not to be considered as a limitation upon the invention.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the apparatus herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means employed.

We therefore particularly point out and distinctly claim as our invention:

1. In an antenna adjusting means for use with rotatable outdoor type antennas, a casing for contact with and mounting on the inner side of a building wall, a tubular bearing secured to and projecting horizontally from said casing to extend through the building wall, a weather seal surrounding the outer end portion of said tubular bearing to abut the building wall, a clamping nut threaded on the outer end of said tubular bearing to clamp said weather seal against the outer side of the building wall and said casing against the inner side of this wall, a rigid operating shaft extending through said tubular bearing, force transmitting means in said casing and connected to said operating shaft, said force transmitting means having an accessible actuating knob, means for locking said force transmitting means in fixed position so as to hold said antenna against drifting under wind pressure, and antenna and clamping means operatively connected with the outer end of said operating shaft.

2. In an antenna adjusting means for use with rotatable outdoor type antennas, a casing for contact with and mounting on the inner side of a building wall, a tubular bearing secured to and projecting horizontally from said gear casing to extend through the building wall, a weather seal surrounding the outer end portion of said tubular bearing to abut the building wall, a clamping nut threaded on the outer end of said tubular bearing to clamp said weather seal against the outer side of the building wall and said casing against the inner side of this wall, a rigid operating shaft extending through said tubular bearing, gear casing in said gear casing and connected to said operating shaft, said gear housing having an accessible actuating knob, means for locking said gear casing in fixed position so as to hold said antenna against drifting under wind pressure, and antenna rotating means operatively connected with the outer end of said operating shaft.

3. A structure as specified in claim 2; together with a set screw extending through said casing and engageable with said gear casing to position same against rotation due to forces such as caused by wind pressure on said antenna.

4. The structure of claim 2 including compass indicia means carried on said casing and visible through the front wall of said casing for aiding to determine the location of which the antenna is to be locked.

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