Oct. 13, 1925.

1,556,725

D. H. SHALLCROSS

SUPPORT FOR RADIOANTENNAE

Filed Jan. 31, 1922

2 Sheets-Sheet 1

FIG. 1

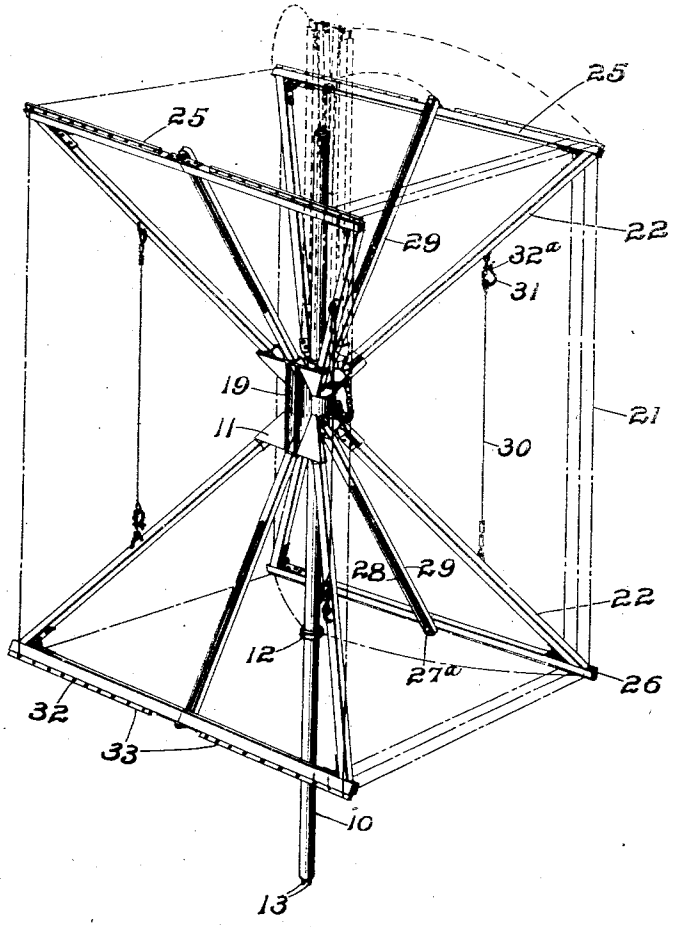


FIG. 2

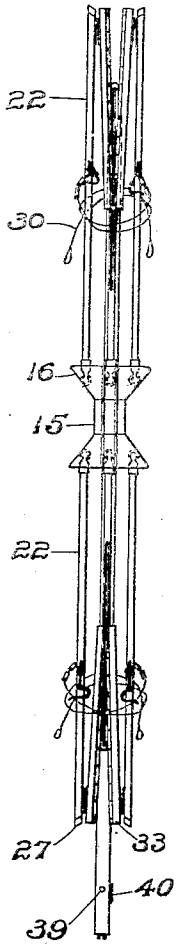
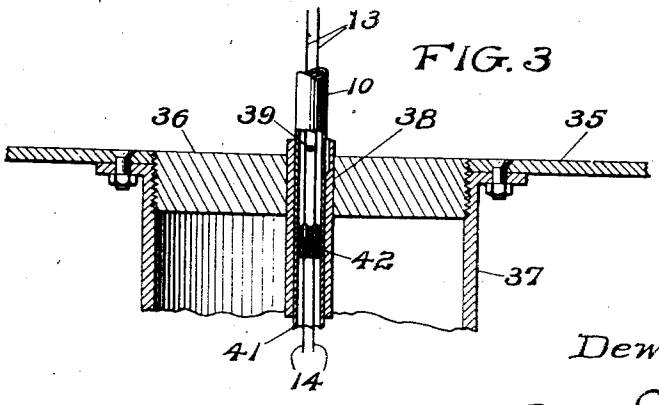


FIG. 3



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Filed Jan. 31, 1922 2 Sheets-Sheet 2

FIG. 4

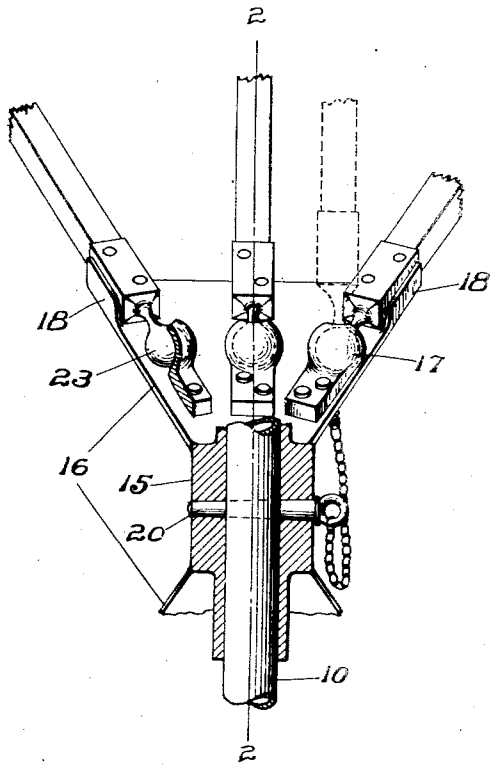


FIG. 5

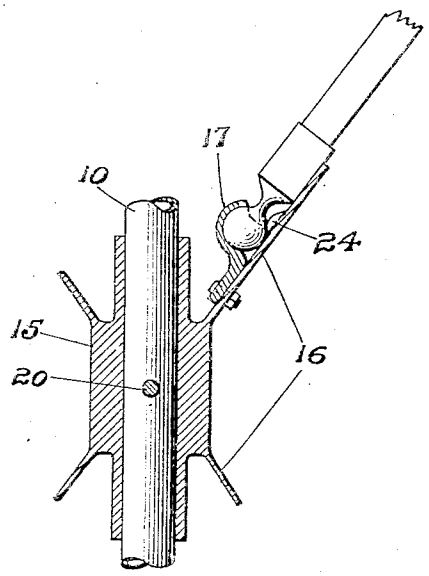


FIG. 6

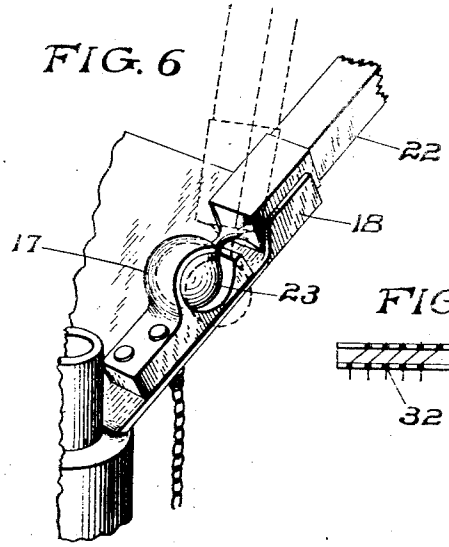


FIG. 7

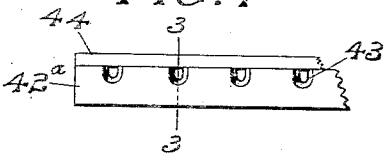


FIG. 8

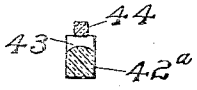
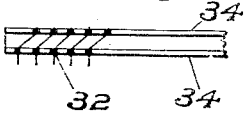


FIG. 9



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Patented Oct. 13, 1925. 1,556,725

UNITED STATES PATENT OFFICE.

DEWEES H. SHALLCROSS, OF CLARENDON, VIRGINIA.

SUPPORT FOR RADIOANTENNÆ.

Application filed January 31, 1922. Serial No. 533,093.

To all whom it may concern:

Be it known that I, DEWEES H. SHALLCROSS, a citizen of the United States, residing at Clarendon, in the county of Arlington and State of Virginia, have invented certain new and useful Improvements in Supports for Radioantennæ, of which the following is a specification.

My invention relates generally to supports for loop types of antennæ and more particularly to those used in connection with apparatus commonly known as the radio compass, radio direction finder, radiogoniometer or directional loop, and more specifically to the frame upon which the loop or coil is wound and has for an object the provision of a structure which is both rotatable in and demountable from its support.

Another object of the invention is the provision of a structure which may be collapsed permitting easy transportation and storage thereof.

With these and other objects in view the invention consists in the construction, combination and arrangement of parts as will be hereinafter described.

Reference is to be had to the accompanying drawings forming part of this specification, in which like reference characters indicate corresponding parts throughout the several views, in which;

Figure 1 is a view of the assembled structure,

Fig. 2 shows the structure in a collapsed and folded position,

Fig. 3 is a sectional view showing the manner of connecting the structure with its support,

Fig. 4 is an enlarged view partly in section showing the manner of supporting the framework of the structure,

Fig. 5 is a view taken on the line 2—2 of Fig. 4,

Fig. 6 is a modification of the supporting means for the frame,

Fig. 7 is a modification of the wire holding means,

Fig. 8 is a view on the line 3—3 of Fig. 7, and

Fig. 9 is a detailed view of the manner of threading the coil on one of the members of the frame.

Referring more particularly to the drawings, the numeral 10 indicates a hollow shaft on which is detachably mounted the central casting 11 and on which is provided an insulating terminal ring 12, preferably constructed of bakelite. Electrical conducting wires 13 pass through the lower portion of the shaft and are connected at their upper ends to terminals on ring 12, the lower ends of the wires being provided with plugs so that they may be easily and quickly connected to or disconnected from the main electrical conductors 14 as will be more fully explained hereinafter.

The central casting 11, shown in detail in Figs. 4 and 5, comprises a body section 15 from which extend the wings 16, the side edges of which converge from the body portion of the casting forming an enlarged platform on which are secured a plurality of sockets 17. The wings have portions of their side edges upturned, as at 18, forming a stop whereby the supporting arms of the frame structure are held in operative position. Reinforcing webs 19 are integrally formed between the wings. While I have shown a tapered pin 20 freely connected to one of the arms for fastening the casting to the shaft, any suitable means for this purpose may be employed.

The frame on which the wire 21 forming the coil is wound comprises supporting bars 22 which are provided with balls 23 engaging in the sockets 17, permitting a free movement therewith. To prevent the ball from accidently becoming disengaged from its socket, I provide a resilient member 24 which is positioned on the wing 16 in proximity to the socket 17. The supporting bars are hingedly connected at their outer extremities to the cross bars 25, which bars have their ends grooved as at 26 to receive tongues 27 formed on the supporting bars 22, as shown in Fig. 2, whereby the connection between the two bars is made more stable. The cross bars 25, which I preferably construct of wood, are hinged at their central portions and have a sliding connection through a pin 27^a engaging in a slot 28 in central bars 29. To secure and prevent accidental displacement of the bars 22 while in extended position I provide a tie connection between the upper and lower sets consisting of a rope, wire or chain 30 secured to the supporting bars adapted to

engage with a hook member 31 or the like secured to corresponding supporting bars, the bight of the hook being closed in any suitable manner, the means I have shown being a ring 32^a.

In order to collapse or fold the frame it is but necessary to unhook tie connections 30, break cross bars 25 at their centers, permitting the halves thereof to fold upon each other as may be more clearly seen in Fig. 2, and then secure them in this position by wrapping the tie connections 30 thereabout. The sliding movement along the central bars 29 allows free movement of the cross bars without straining the coil wire 21 during the movement of the outer extremities of the cross bar.

The wire 21 is wound upon the frame by passing it through slots 32 formed in a strip of insulating material 33, there being a strip secured in any desired manner to each section of the cross bars 25. The free ends of the wire are connected to terminals on ring 12, thereby forming electrical connection with the electrical conductors 13. In order that each turn of wire in the coil may be in a true vertical position on the frame I preferably form on one of the bars 25 insulating strips of a channel construction, as may be clearly seen in Fig. 9. In each of the sides 34 the slots 32 through which the wires pass are in alignment, and in alignment with all corresponding slots in other bars 25, the wiring being brought through a slot in one side 34, then crossed over to the adjacent slot in the opposite side, and then taken around the frame structure to the slot in the first side which is in alignment with the slot through which the wire left the strip, and so on.

In Fig. 3 I have shown the general and preferred manner of connecting the structure with its support. In this view 35 is the deck of a vessel or floor or roof of a building having an opening therein, which opening is closed by a plate 36. A housing 37, containing the operating machinery (not shown) is secured to the underside of the deck or floor or roof and into which is threaded the plate 36. A sleeve or bearing 38, suitably supported at its lower end, passes through an opening in the plate 36 and receives the shaft 10, which is secured therein against movement by a pin, preferably of tapered construction, passing through the opening 39 in the shaft 10 and engaging in an opening in the sleeve 38. A shaft 41 secured to the sleeve 38 carries the main conductors 14 which terminate in the electric socket 42 for the reception of the plugs secured to the conductors 13. Key 40 engaging in a key way in sleeve 38 assures proper connection between plugs 13 and socket 42. Sleeve 38 is rotated through suitable operating machinery (not shown) and thus rotates the structure mounted on shaft 10. It will be seen that easy connection or disconnection may be had and the structure readily demounted.

By the modification of the holding means shown in Fig. 6 I permit easy removal of the balls 23 from their sockets 17 by constructing the sockets with one side open. After raising the supporting bars 22 so that it will avoid the upturned edges 18, lateral movement may be imparted to the balls freeing them from their sockets.

While I have shown the coil wire 21 passing through openings in the strip 33, I prefer to construct this wire holding means as shown in Figs. 7 and 8, wherein I use an insulating strip 42^a having at regularly spaced intervals slots 43 having their edges curved as shown. The wire is held in the grooves by a strip 44 of any suitable insulating material which is fastened to the insulating strip 42^a in any desired manner after the wire is inserted.

It is to be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of my invention in that minor changes in the details of construction, proportion and arrangement of parts may be made within the scope of the appended claims and without sacrificing any of the advantages of my invention.

Having fully described my invention what I desire to secure by Letters Patent is:

1. An antenna support including a shaft, a frame supporting member carried by said shaft, and a collapsible coil frame including a plurality of members hingedly connected to said frame supporting member and a plurality of collapsible bars connecting the outer terminals of a portion of said hinged members carried by said frame supporting member.

2. A radio coil antenna construction including a rotatable mounting, a shaft detachably connected and rotatable with said mounting, electrical conductors passing through said shaft, electrical plug connectors in the mounting end of the shaft, a frame carried by the shaft, a coil about the frame and electrically connected to said conductors, and electrical conductors in the mounting adapted to contact with said plug connectors to complete the electrical circuit in the mounting.

3. A radio antenna and its support including a shaft, a central body carried by said shaft, lateral wings formed on said body, sockets mounted on said wings, a collapsible frame having its supporting arms mounted in said sockets, and a coil about said frame.

4. An antenna support including a shaft, a central body having laterally extending wings mounted thereon, sockets carried by said wings, a collapsible frame having its

supporting bars seated in said sockets, and means for preventing accidental displacement of said supporting arms.

5. An antenna support including a shaft, a body having laterally extending wings mounted thereon, portions of the edges of said wings being upturned to form stops, sockets arranged on the wings and a frame having supporting arms engaging in the sockets and contacting with said stops.

6. A radio antenna and its support including a shaft, a collapsible frame including supporting arms and cross-bars carried by said shaft, a coil about said frame, the cross-bars of said frame having U-shaped slots, aligned bar for bar for the reception of the wire of said coil, and means for holding said wire in the slots.

7. A radio antenna and its support including a shaft, a collapsible frame carried thereby, said frame comprising supporting arms and cross-arms, one of the said cross-arms having two sets of aligned slots, a coil about said frame, the wire of said coil passing through a slot on one side of said arm, crossed over to the adjacent slot in the opposite side, then carried around the frame to the slot in the first side which is in alignment with the slot through which the coil left the bar, and means for holding the wire in said slots.

DEWEES H. SHALLCROSS.