Sept. 17, 1935. A. LEIB 2,014,852

DIRECTION FINDER LOOP AERIAL

Filed Aug. 10, 1932

Fig. 1

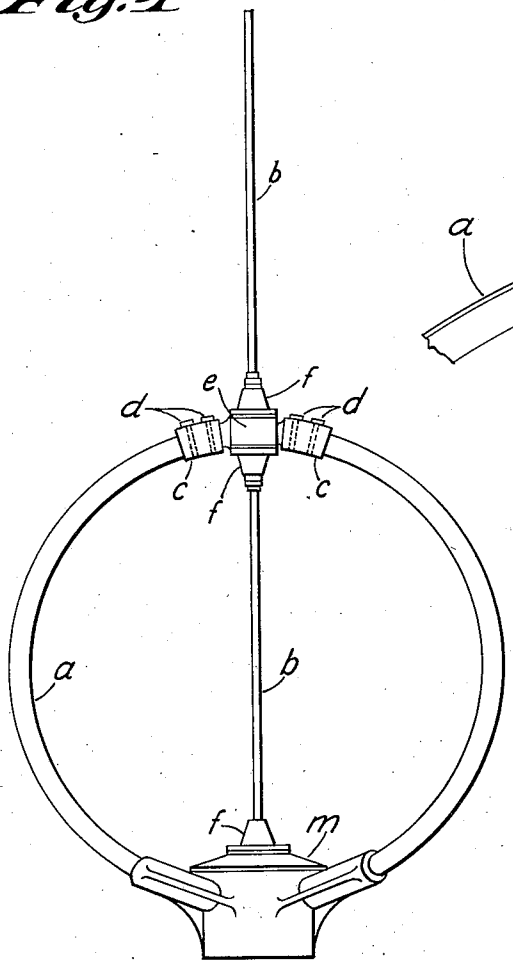


Fig. 3

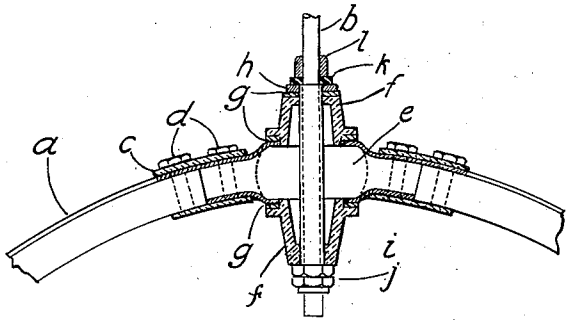


Fig. 2

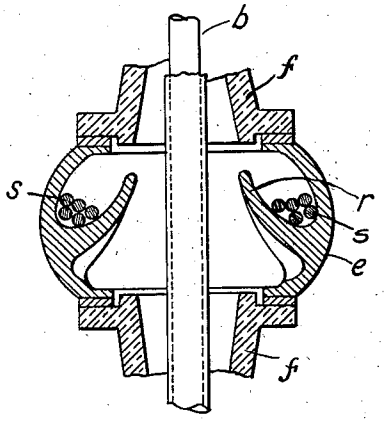
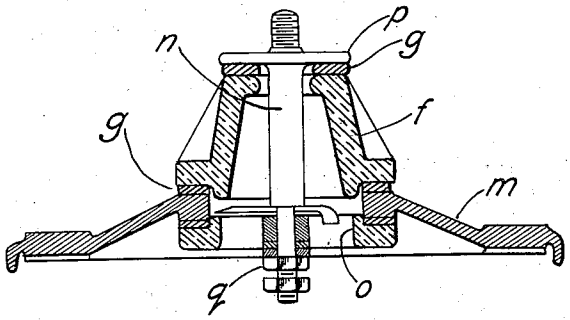


Fig. 4



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Patented Sept. 17, 1935 2,014,852

UNITED STATES PATENT OFFICE

2,014,852

DIRECTION FINDER LOOP AERIAL

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Application August 10, 1932, Serial No. 628,132
In Germany August 11, 1931

7 Claims. (Cl. 250—33)

This invention relates to a loop aerial combined with a straight auxiliary aerial.

An object of this invention is to provide a waterproof coil or loop arranged in combination with an open antenna.

The combination of a loop antenna and a linear auxiliary antenna is well known in the prior art. In designing and in the practical use of such a combination scheme certain difficulties have been encountered when the coil antenna was of the weather-proof type. In the first place it was found hard to introduce the coil winding when the auxiliary antenna was passed through the apex of the loop ring. In fact, difficulties in introducing the loop winding were encountered not only when making the ring, but also in repair and maintenance work necessary from time to time.

Furthermore, serious difficulties are met in combining an adequate insulation both for the coil ring as well as between the grounded ring parts of the winding and the rod antenna. The amount of insulation required in the coil ring and in the rod antenna, most particularly in the latter, is very large in the case of sea craft since the equipment must be absolutely reliable in operation, also when soot-covered and under the action of rain and splashing water. Great difficulties are found also for the reason that heavy duty and careless handling on small marine vessels occasionally cause destruction of the insulation by the clashing of heavy chains and other objects. This necessitates a chance of effecting an easy and expeditious replacing of these insulators.

Now, all of these difficulties are obviated by a form of construction as hereinafter to be disclosed. By means of two elastic (flexible) insulation tubes or hoses, the passing of the auxiliary antenna is insured in the middle of the coil ring. The form thereof is so chosen that when the antenna duct has been removed, the coil winding can be readily inserted and be withdrawn. For the insertion of the insulator ducts for the auxiliary antenna, the winding of the loop or coil antenna is spread open and is retained either by lateral finger-shaped means or by means of a spacer ring. The parts from which the fixed insulator duct of the upper lead-through is assembled are of the same construction and size, they are held together by screw unions and are therefore readily replaceable. Also, for the lower lead-through or duct (upon the cover of the coil ring support) the insulator body is exchangeable and of the same construction so that maintenance and repair work is feasible with a limited number of spare parts.

Through such an antenna duct or lead-through it is possible to pass at will and according to practical requirements either a rod-type auxiliary aerial or a wire auxiliary aerial, while all conditions for ruggedness, insulation and perfect electrical symmetry are obtained.

One exemplified embodiment of the construction according to this invention is illustrated in the drawing. Fig. 1 shows an elevation of the coil antenna combined with the auxiliary antenna. Fig. 2 is a cross-section through the upper duct or lead-through. Fig. 3 is a longitudinal section through the upper portion of the loop. Fig. 4 is a detailed cross sectional view through the lower portion of the loop.

Referring to the drawing, *a* denotes the weather-proof coil hollow protecting ring, *b* the linear auxiliary antenna, *c* the insulation hoses which are secured by means of clips *d*, on the one hand, to the ring, and, on the other hand, to the insulator support *e* made preferably from a light-metal casting.

On the insulation support *e* by means of padding rings *g* there are carried two porcelain insulators *f* and firmly united with a clamp tube *i* having a collar *h* at the top and a jam nut *j*. For sealing the duct water-proof there is used a rubber ring *k* which is covered by a cap screw *l*. In a similar manner, in the case of the bottom duct, the porcelain insulator *f* is secured on the metallic cover *m* of the pot supporting the coil ring by the aid of a clamp bolt *n* with a fixed collar *p*, clamp disk *o* (made of insulation), and a jam nut *q*. The jam stud or bolt *n* has a screw-thread on top, upon which the lower end of the rod-type auxiliary antenna may be screwed.

In order that the turns of the coil antenna may be spaced apart from the auxiliary antenna and retained in that position, the inner walls of the support *e* (Fig. 2) are provided with hook-shaped props *r* whereby the two halves of the winding *s* are kept separated.

I claim:

1. In a weatherproof coil aerial having in combination an auxiliary rod type antenna comprising a coil aerial within a hollow protective ring, an aperture in the apex of said protective ring, a rod type antenna, a hollow insulating member interposed in the apex of said protective ring and two hose-like tubes for securing said insulating member to said coil antenna, said rod type antenna arranged to pass through the center of said hollow insulating member.

2. An aerial according to claim 1 with the characteristic feature that the hollow insulating member comprises securing and guiding means for the passage of the winding of said coil aerial.

3. In combination a radio direction finder coil antenna and a vertical rod-type antenna, comprising a hollow weather proof ring having a plurality of conductor turns forming said coil antenna, a plurality of insulated members centrally secured to said coil antenna weather proof ring and surrounding said vertical rod-type antenna so as to retain said rod-type antenna in the middle of said coil antenna and providing electrical insulation and symmetry with respect to the conductor turns of said coil antenna.

4. In combination a radio direction finder coil antenna and an auxiliary vertical wire antenna, comprising a hollow weather proof ring having a plurality of conductor turns forming said coil antenna a plurality of insulated members centrally secured to said coil antenna weather proof ring and surrounding said wire antenna so as to retain said auxiliary vertical wire antenna in the middle of said coil antenna and providing electrical insulation and symmetry with respect to said conductor turns of said coil antenna.

5. In combination a radio direction finder coil antenna and a vertical rod-type antenna, comprising a hollow weather proof ring having a plurality of conductor turns forming said coil antenna, a plurality of porcelain insulators centrally secured to a metallic member which is retained by said coil antenna weather proof ring, said rod-type antenna passing through said porcelain insulators so as to retain said rod-type antenna in the middle of said coil antenna and providing electrical insulation and symmetry with respect to said conductor turns of said coil antenna.

6. In combination a radio direction finder coil antenna and a vertical rod-type antenna, comprising a hollow weather proof ring having a plurality of conductor turns forming said coil antenna, a plurality of porcelain insulators centrally secured to a metallic member which is retained by the hollow weatherproof ring of said coil antenna, said metallic member having internal lateral finger-shaped means for retaining the windings of said coil antenna, said rod-type antenna passing through said porcelain insulators so as to retain said rod-type antenna in the middle of said coil antenna and providing electrical insulation and symmetry with respect to the conductor turns of said coil antenna.

7. A radio direction finder coil antenna comprising a metallic pedestal, a hollow protective ring for the winding of said coil antenna which is secured to said pedestal, a rod-type antenna extending upward from said pedestal, passing through and retained by an insulator secured to said pedestal, the upper portion of said rod-type antenna passing through the middle of the hollow protective ring of said coil antenna, upper and lower insulators for said rod-type antenna secured to a central metallic member attached to the apex of said coil antenna, and insulation means interposed between said protective ring and said metallic member.

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