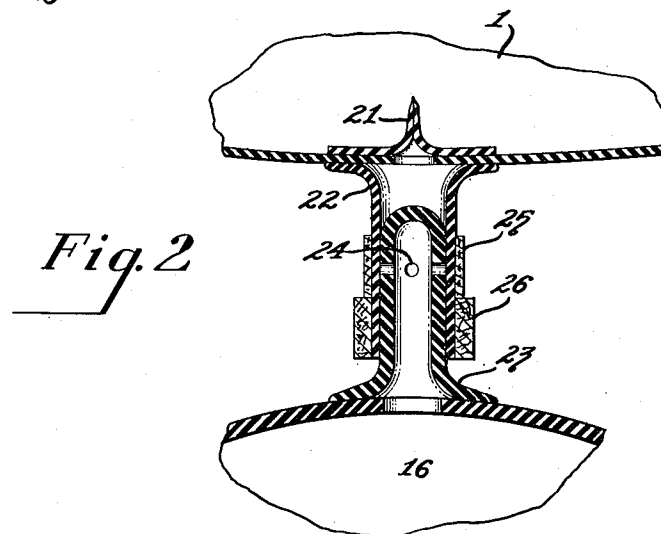
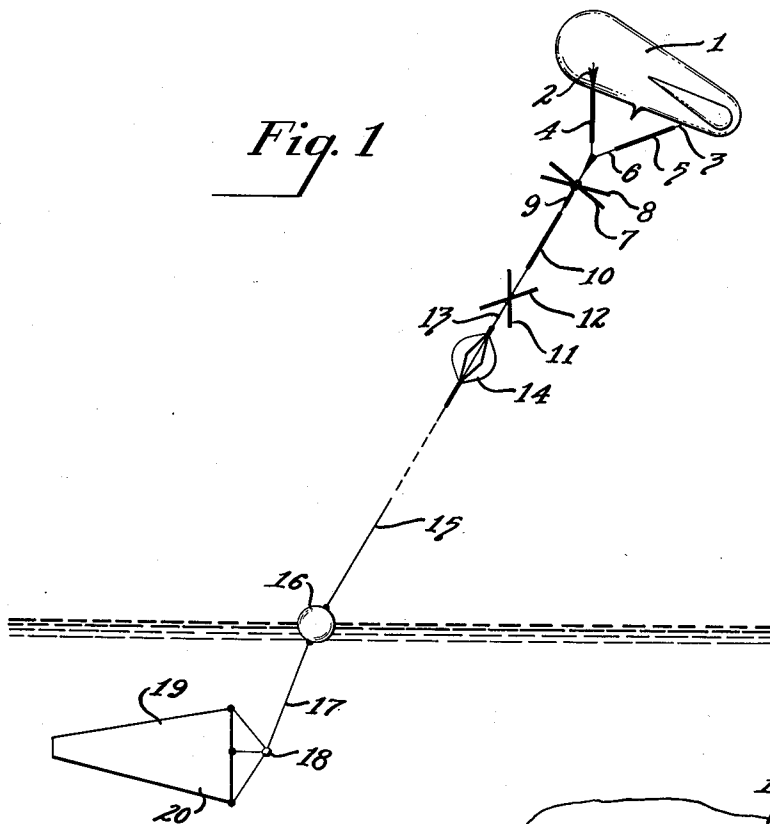


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RADIO REFLECTOR MARKER

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RADIO REFLECTOR MARKER

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4 Claims. (Cl. 343-18)

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This invention relates to a radio reflector marker for radar systems and is particularly adapted to retain radar reflectors above the surface of a relatively large body of water.

One of the problems encountered in radar marker type reflectors is to locate them at a substantial height above the surface of the water.

According to my invention, the reflectors are held at a desired height by a balloon which has an attached float and an anchor. The balloon is preferably of a type which will operate as a kite as well as a balloon, so that it will not be pushed down into the water by strong winds.

This invention will best be understood by referring to the accompanying drawings, in which:

Fig. 1 is an elevation of the radar reflector system of this invention; and

Fig. 2 is a sectional detail of the gas container float which is provided with a water soluble band to inflate, and a second water soluble band to release the balloon.

Referring now in detail to Fig. 1 of the drawing, the guide balloon 1 is provided with anchor ropes 2 and 3 to which radio reflectors 4 and 5 are attached. The lower portions of reflectors 4 and 5 terminate in a Y-shaped connection member 6 to which other reflectors 7 and 8 are secured, these reflectors being disposed in a different angular position to that of reflectors 4 and 5. A connection member 9 joins reflectors 7 and 8 to another reflector 10, the lower portion of which connects to reflectors 11 and 12 which are disposed in a different angular position with respect to that of reflectors 7, 8, 9 and 10. Link 13 connects reflectors 11 and 12 to reflector 14. A balloon cord 15 connects the lower part of reflector 14 with a level adjuster float 16. A cord 17 connects the lower portion of level adjuster float 16 with a lead weight 18 to which is secured a sea anchor 19 which is preferably made with a folded frame of spring material which opens up to form a cloth cone 20.

The reflecting wires 4, 5, 7, 8, 10, 11, 12 and 14 are attached to the balloon or the cord, or both, and are so positioned as to receive radiant energy of any polarization from and reflect the same in any direction. Preferably, each reflector wire should be adjusted in length for one-half wave resonance to the frequency of the radar equipment.

Referring now in detail to Fig. 2 of the drawing, the balloon 1 is provided with a rubber check valve 21 and a tubular depending portion 22. The level adjuster float 16 is preferably in the form of a hollow spherical or cylindrical mem-

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ber and serves as a gas container. The upper portion of float 16 is provided with a valve stem 23 with apertures 24 for releasing the gas when it is desired to inflate the balloon. The balloon

and float 16 are assembled with the depending portion 22 telescoping over the valve stem 23 and thus covering the apertures 24. Surrounding the depending portion 22 is a water soluble band 25 which is released to inflate the balloon.

A second water soluble band 26 is positioned just below band 25 and is made sufficiently large to require a longer time for releasing the balloon after it is inflated by the gas within container 16. The pressure of the gas in the depending rubber portion 22 forces the balloon loose from stem 23 after band 26 is dissolved in the water. As the line cord 15 is attached to the float 16, balloon 1, and the reflectors, this permits balloon 1 to rise to a desired height. The balloon should follow the design of a kite type balloon generally used as balloon barrages for the protection of ships and cities. The anchor cord between the balloon and the anchor 19 should be of strong waterproof insulating material to which the reflecting wires are attached.

In the operation of this device, the whole assembly is preferably placed in a hermetically sealed can which can be opened as needed, and the balloon, reflector and anchor assembly taken out and dropped through a hole or tube from an airplane into the water. When float 16 hits the surface of the water, the water splashes up over the surface of this float and strikes the first water soluble band 25 which disintegrates and causes the rubber depending portion 22 to expand enough to open apertures 24, which in turn release the gas held under pressure within container 16. The gas then enters balloon 1 from the rubber check valve 21 and inflates the guide balloon which tries to rise when the gas has fully inflated it. The second water soluble band 26, which is larger and therefore takes a longer time to disintegrate, releases the hold between stem 23 and balloon 1 after it is fully inflated by the gas within container 16. Thus, the automatic balloon inflater and release mechanism permits balloon 1 to rise to a desired height, taking with it the balloon cord 15 and the radio reflectors which are attached thereto.

The balloon type of radar reflector of this invention can be packed as a small, light weight unit which can be handled easily.

One application for the marker is to fix the approximate location of any object seen on or in the water so that it is possible to return re-

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peatedly to the location even though sight of the object may be lost, using either the visible presence of the balloon, or when visibility is poor or absent, using radar.

What is claimed is:

1. A radar balloon reflector comprising a balloon having a mooring line secured thereto, a plurality of metallic reflectors secured to said balloon and said mooring line, said reflectors being arranged in a row and disposed at different angular positions with respect to adjacent reflectors, a float secured to said mooring line to support said balloon and reflectors above the surface of a body of water to receive radiant energy waves of any polarization from and reflect the same in any direction, inflating means on said float comprising an automatic balloon inflator having attached thereto a water soluble band which releases gas to inflate the balloon, and a second soluble band secured to said balloon and float which releases the balloon after it has been inflated.

2. A radar balloon reflector comprising a kite type balloon having a mooring line secured thereto, a plurality of metallic reflectors secured to said balloon and said mooring line, said reflectors each being substantially a half wave long at the operating frequencies of associated radar equipment, said reflectors being arranged in a row and disposed at different angular positions with respect to adjacent reflectors to receive radiant energy of any polarization from and reflect energy in any direction, a float, a weight and a sea anchor secured to said mooring line, inflating means arranged on said float comprising an automatic balloon inflator having a water soluble band arranged to release gas to inflate said balloon, and a second water soluble band secured to said balloon and float and arranged to release the balloon after it has been inflated.

3. A radar device adapted to be dropped into a body of water, comprising a balloon, a line cord secured to said balloon, a plurality of metallic reflectors, each of said reflectors being linked together and disposed in a row at different angular positions with respect to adjacent reflectors, the reflectors at one end of the row being secured to said balloon and the reflectors at the other end of the row being secured to one end of said line cord, a float containing gas secured to the other end of said line cord, inflating means on said float comprising an automatic balloon inflator having a water soluble band to release said gas to inflate said balloon, and further water soluble band means on said float to secure said balloon to said float and to release the balloon

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from said float after it has been inflated to cause said balloon to rise with said reflectors to a height above the surface of said body of water to receive radiant energy waves of any polarization from and reflect the same in any direction.

4. A radar device adapted to be dropped into a body of water, comprising a balloon, a line cord secured to said balloon, a plurality of metallic reflectors, each of said reflectors being linked together and disposed in a row at different angular positions with respect to adjacent reflectors, the reflectors at one end of the row being secured to said balloon and the reflectors at the other end of the row being secured to one end of said line cord, a float containing gas secured to the other end of said line cord, inflating means on said float comprising an automatic balloon inflator having a water soluble band to release said gas to inflate said balloon, and further water soluble band means on said float to secure said balloon to said float and to release the balloon from said float after it has been inflated to cause said balloon to rise with said reflectors to a height above the surface of said body of water to receive radiant energy waves of any polarization from and reflect the same in any direction, and anchor means secured to said float to confine said balloon and said reflectors in a desired position on the surface of said body of water.

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