

July 9, 1946.

S. MEHL, JR

2,403,539

BUOY

Filed April 3, 1944

2 Sheets—Sheet 1

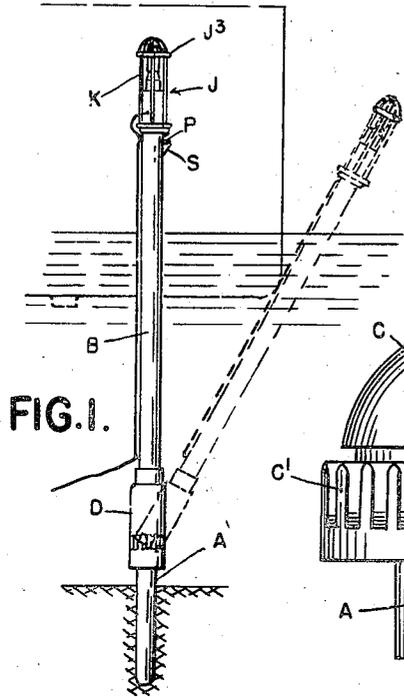


FIG. 1.

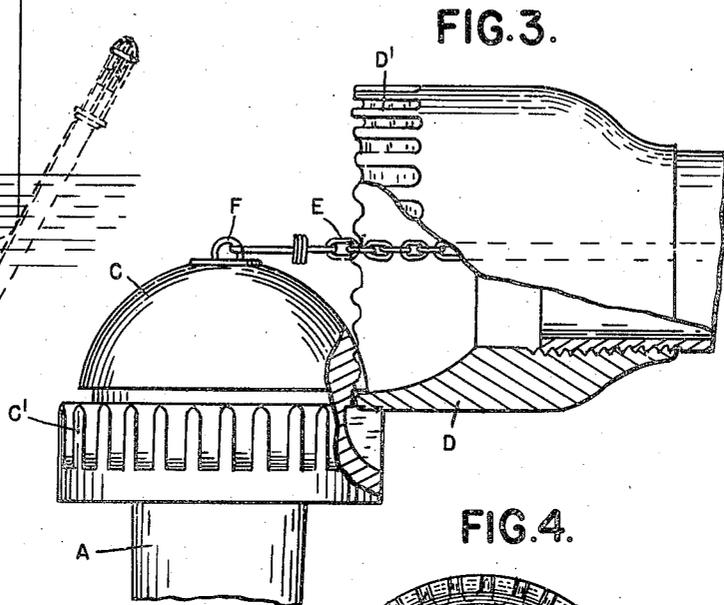


FIG. 3.

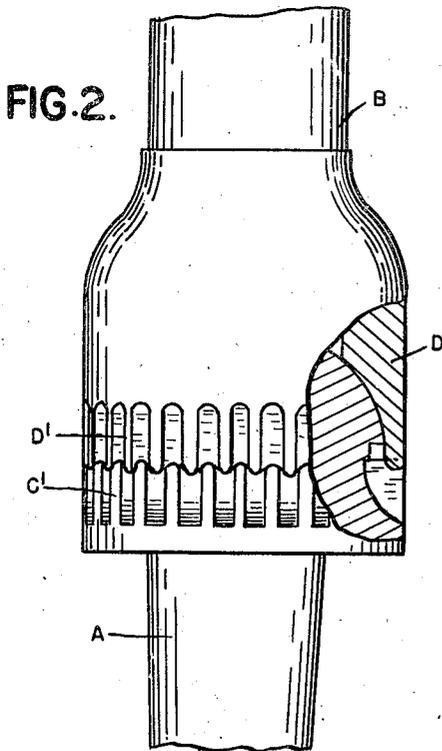


FIG. 2.

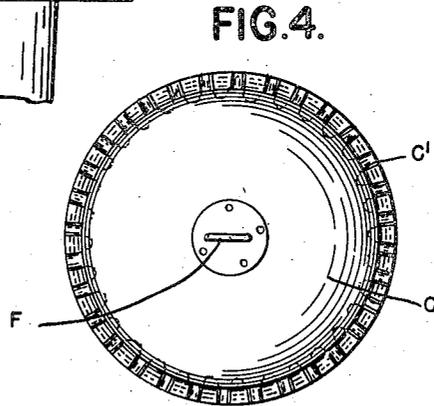


FIG. 4.

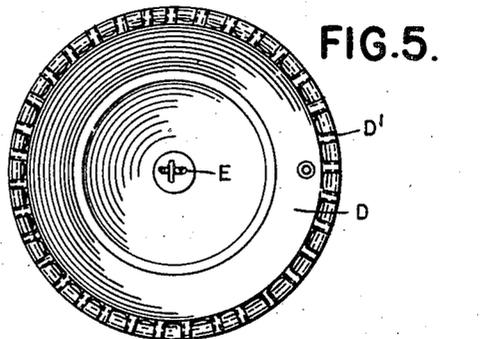


FIG. 5.

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2 Sheets-Sheet 2

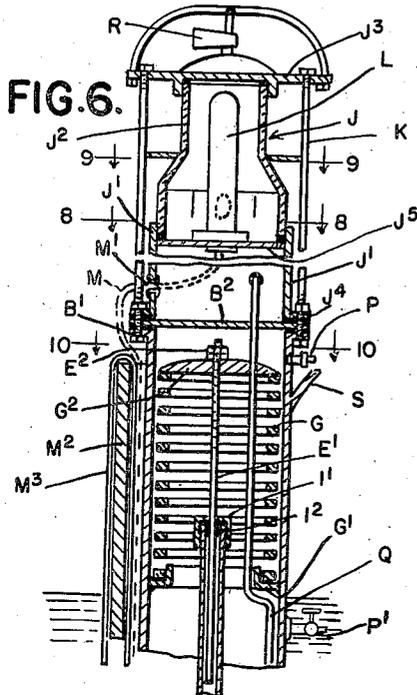


FIG. 6.

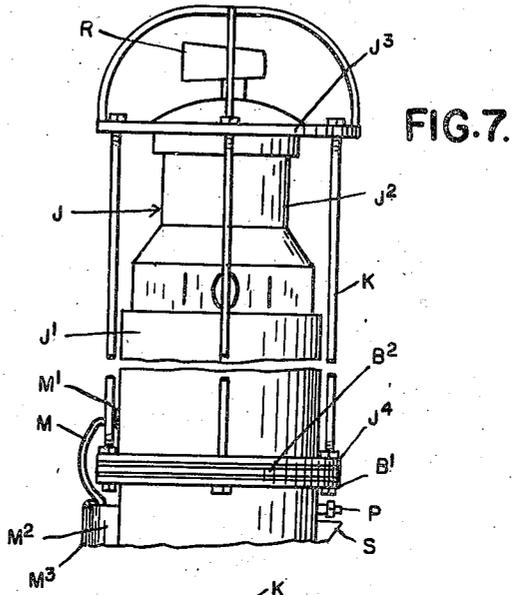


FIG. 7.

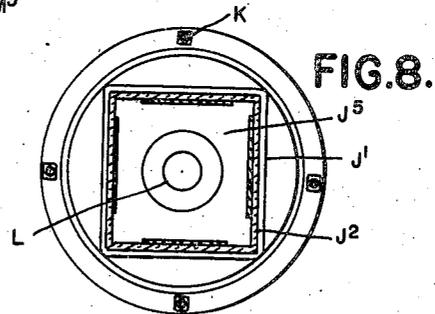
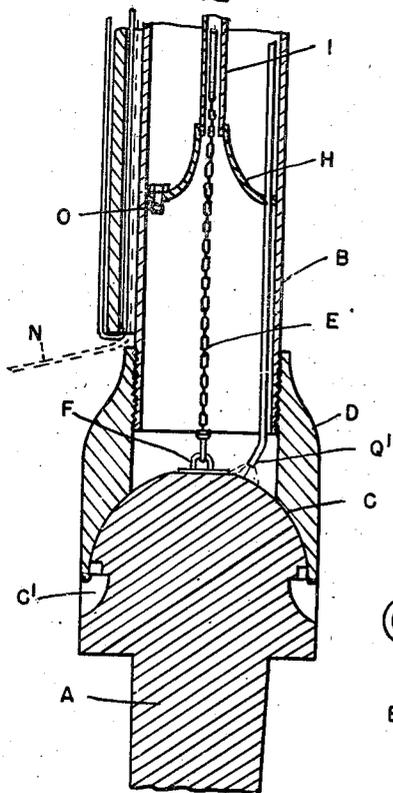


FIG. 8.

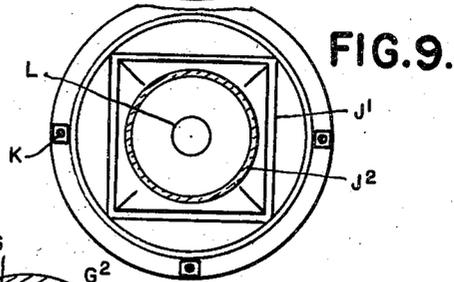


FIG. 9.

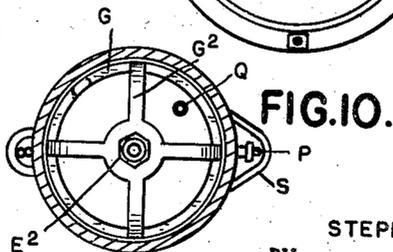


FIG. 10.

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2,403,539

BUOY

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Application April 3, 1944, Serial No. 529,294

9 Claims. (Cl. 9—8.3)

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The invention relates to buoys or channel markers and has for its object the obtaining of a construction which, while normally held in fixed position, will not be injured by collision therewith of any floating body.

It is a further object to provide means for easily connecting to the buoy an electric conductor cable for operating a light thereon. With these and other objects in view the invention consists in the construction as hereinafter set forth.

In the drawings:

Fig. 1 shows in full lines my improved buoy or channel marker in normal position and in dotted lines the displacement thereof by a boat or other floating object;

Fig. 2 is an elevation partly in section of the connection between the displaceable portion of the channel marker and the anchorage therefor;

Fig. 3 is a similar view showing the movable portion in displaced position;

Fig. 4 is a plan view of the anchor portion;

Fig. 5 is a bottom plan view of the movable portion;

Fig. 6 is a vertical central section;

Fig. 7 is an elevation of the lamp mounted on the top of the buoy; and

Figs. 8, 9 and 10 are horizontal sections, respectively, on lines 8—8, 9—9 and 10—10, Fig. 6.

Generally described, my improved buoy or channel marker comprises a stake having a lower anchor portion which is driven into the lake or river bottom and an upper buoyant portion which extends above the surface of the water and which may be provided with a light at its upper end. It is important to hold the stake normally in fixed position so as to accurately define the channel bank or other obstruction to navigation. It is equally important to permit of displacement of the marker in case any traveling body collides therewith. I have, therefore, provided a connection between the anchor and the upper portion which permits the latter to be freely displaced in any direction and which, when the colliding body is removed, will permit return to normal position.

As illustrated, A is the anchor portion of the stake and B is the portion extending upward therefrom to above the surface of the water. The anchor A is provided at its upper end with a semi-spherical portion C which engages a semi-spherical socket member D. The latter is threadedly engaged with a tubular member which forms the upper portion B of the stake extending to any desired distance above the surface of the water. Within the tube B is a chain or cable E which at

its lower end is connected with a staple or other fastening F centrally connected with the member C. The upper portion of the member E is formed by a rod E' which is connected to a coil spring G, the lower end of which is seated on a flange G' welded or otherwise secured to the tube B. The connection between the rod E' and spring is formed by a spider G² resting on the spring and centrally apertured for the passage of the rod. The rod is threaded and nuts E² engaging the same form a means for adjusting the length of the member E so as to hold the socket D in engagement with the spherical head C. To prevent any rotation of the member B with respect to the anchor A, the head C is formed with an annular fluted or toothed portion C' and the socket D is provided with a conjugate annular toothed portion D'. These portions C', D' interengage and prevent any relative rotation of the members D and C while permitting a rocking of the former upon the latter in any direction. Such rocking movement will draw upon the member E thereby compressing the spring G so that whenever the member is free it will be returned by the spring G to its normal position. As the joint between the members C and D is not water-proof, hydrostatic pressure will force water upward in the tube B. However, for sake of buoyancy the tube B must contain an air chamber and it is also desirable to keep the spring G away from the water so as to avoid corrosion. This I have accomplished by placing a conical head H across the lower portion of the tube B with a small tube I connected with this head and extending upward to the location of the spring G. A cap I' at the upper end of the tube I through which the rod E' passes and a packing I² within this cap form a water-proof joint with the rod.

A lantern J is mounted at the upper end of the tubular post B and preferably comprises a rectangular base portion J', a transparent portion J² and a cap portion J³. These portions are secured to a flange B' at the upper end of the tubular post by means of a plurality of rods K extending therefrom to the cap J³. The portion J' has a flange J⁴ at its lower end and between the flanges B' and J⁴ is a partition B². Within the transparent member J² is an electric lamp L which is secured to a cross member J⁵ in the member J' on which the member J² also rests. Current is supplied to this lamp through insulated conductors M which pass out from the base J' through an insulator bushing M' and then extend downward through a conduit M² which is secured to one side of the member B.

The conduit M² extends to near the member D and there is also an endless cable M³ one portion of which passes through the conduit M² and another portion returns outside of said conduit. This provides a means for making electrical connection between the lamp and the service cable N, which normally lies on the bottom, and without the use of a diver. Thus, during original installation the end of the cable N is carried above the water and temporarily attached to the endless cable M³ after which this cable M³ is drawn around to carry the cable N to the lower end of the conduit M² and then upward through said conduit to the upper end of the same which is above the water level. At this point the operator may unfasten the cable N from the endless cable M³ and make connections between the same and the conductors M; or, if desired, the end portion of the cable N may be passed through the bushing M' and directly connected with the lamp L.

With the construction as described, when the channel marker is to be installed, it is carried to the proper location and is then driven downward to imbed the anchor portion A in the bottom. During the performance of this operation the lamp J may be removed which will permit of driving the post from the upper end thereof. The electrical connections are then made as before described by attaching the service cable to the endless cable M³ and drawing it around through the conduit M². The lamp J can then be secured in position which completes the installation. During service if at any time a boat should strike against the upper portion of the post, it will merely temporarily displace the post swinging it on the universal joint between the members D and C. There is no limit to the amount of angular movement permitted by this universal joint so that the boat might even pass completely over the marker without injury thereto. As soon as freed, the marker will return to its normal position through the action of the spring G.

To remove any water from the air chamber within the tube due to either condensation or leakage, I have provided a check valve in the head H through which water may be ejected into the lower portion of the tube. The force for ejecting the water is obtained by increasing the air pressure within the air chamber which may be accomplished by a valved filler tube P similar in construction to that used for a pneumatic tire. Thus, at any time this tube may be connected with a pump or source of air under pressure which will raise the pressure in the air chamber and eject water through the valve O. I have also provided means for ejecting any sediment that may collect in the water-filled portion of the tube B and in the member D. This consists of a tube Q which extends down through the tube B to a discharge nozzle Q' at its lower end adjacent to the semispherical member C. The upper end of this tube passes out through the portion J' and may be connected to a pump or source of compressed air. This will permit of blowing air or water through the nozzle Q' against the spherical portion C cleaning away any dirt or sediment that may lodge thereon.

To provide an audible signal in case of fog, an electric horn R is mounted on the top of the lantern J. The conductors for operating this horn may be carried through the same cable that supplies current to the lamp L. In case a boat colliding with the buoy should pass over the same,

it is important that the structure should be streamlined leaving nothing which might catch and be torn off by such passage. This may be accomplished by placing a conical or inclined flange S on the post below the lantern which will guard the projecting parts of the latter. During the winter season it is not necessary to remove the buoy but only to sink it to a point which is lower than the greatest depth of ice. This can be done by first removing the lantern and then attaching to the upper end of the section B sufficient weight to overcome its buoyancy. Another method would be to permit the air within the tube B to escape as by opening the valve in the filler tube P and also a water cock P' in which event the weight would be unnecessary. When the device is to be restored to operative condition, the sunken member B may be raised as, for instance, by the use of a magnet at the end of a cable. The chamber within the tube B can then be filled with air and the lantern replaced at the upper end of this member. One of the chief advantages of my construction is that it defines a channel bank or obstruction with much greater accuracy than can be done with a floating buoy. This is particularly advantageous in case of a narrow channel, especially where the horn is provided for use in case of fog.

What I claim as my invention is:

1. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween permitting tilting movement of the one section on the other in any direction, said lower section forming an anchor which may be driven into the bottom beneath said body of water and said upper section containing an air chamber for imparting buoyancy thereto, means for preventing relative axial rotation of said sections, and yieldable means for holding said sections normally in axial alignment and for returning them to this position when the upper section is displaced.

2. A buoy or channel marker for a body of water comprising a post formed in two sections with a universal joint therebetween, the lower section constituting an anchor which may be driven into the bottom beneath said body of water and the upper section being tubular, said universal joint comprising a semi-spherical member at the upper end of the anchor section with an annular toothed portion adjacent thereto and a semi-spherical socket connected to the upper section of said post provided with a conjugate annular toothed portion, a partition in said tubular member for separating the space therein into a lower water chamber and an upper air chamber, a small tube centrally connected with said partition and extending upward therefrom, a rod extending through said small tube provided at its lower end with a flexible connection to said semi-spherical member, and a spring in the upper portion of said tubular section connected with said rod whereby the tilting of said upper tubular section in any direction will compress said spring and the reaction of the latter will return said section to its normal position.

3. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween, the lower section forming an anchor which may be driven into the bottom beneath said body of water and said upper section being rockable in any direction on said lower section, resilient yieldable means for holding said sections normally in axial align-

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ment and for returning them to this position when the upper section is displaced, a lantern at the upper end of said upper section, an electric lamp for said lantern, a conduit at the side of said upper section extending from near the bottom to above the water level, and means operable from above the water for carrying the end portion of a conductor cable downward to the bottom of said conduit and upward therethrough to a position where it can be connected to said electric lamp.

4. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween, the lower section forming an anchor which may be driven into the bottom beneath said body of water and said upper section being rockable in any direction on said lower section, resilient yieldable means for holding said sections normally in axial alignment and for returning them to this position when the upper section is displaced, a lantern at the upper end of said upper section, an electric lamp for said lantern, a conduit at the side of said upper section extending from near the bottom to above the water level, and an endless cable extending through said conduit and returning outside the same constituting a means for carrying the end portion of a conductor cable from above the water level downward toward the lower end of said conduit and upward therethrough to a position where it can be connected to said electric lamp.

5. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween, the lower section forming an anchor which may be driven into the bottom beneath said body of water and said upper section being tubular and containing an air chamber and resilient yieldable means for holding said sections normally in axial alignment and for returning them to this position when the upper section is displaced, said means comprising a connection to said lower section extending upward centrally into said air chamber and a spring in said air chamber, a check valve at the bottom of said air chamber through which any water therein may be ejected, and means for supplying air under pressure to said chamber for forcing water outward through said check valve.

6. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween, the lower section forming an anchor which may be driven into the bottom beneath said body of water and the upper section containing an air chamber, said universal joint comprising a semi-spherical member at the upper end of the anchor section with an annular toothed portion surrounding the base

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thereof, a semi-spherical socket connected to the lower end of the upper section provided with a conjugate annular toothed portion whereby said upper section may be rocked in any direction but is held from axial rotation with respect to said lower section and a conduit extending through said upper section from above the water level to a discharge nozzle directed against said universal joint whereby the latter may be cleared from dirt or sediment by fluid blown through said conduit.

7. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween, the lower section forming an anchor which may be driven into the bottom beneath said body of water and the upper section containing an air chamber for imparting buoyancy thereto and being displaceable in any direction, means for yieldably holding said sections normally in axial alignment and for returning them to this position when the upper section is displaced, signal means mounted on the upper end of the upper section, and means for streamlining said upper section to permit the passage of a floating body thereover without catching on any part.

8. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween permitting tilting movement of one section on the other in any direction, said lower section forming an anchor which may be driven into the bottom beneath said body of water and said upper section containing an air chamber for imparting buoyancy thereto, yieldable means for holding said sections normally in axial alignment to accurately define the position thereof, and means for submerging and holding the upper section submerged to a depth below the maximum depth of ice in the winter season.

9. A buoy or channel marker for a body of water comprising a post formed in two sections having a universal joint therebetween permitting tilting movement of one section on the other in any direction, said lower section forming an anchor which may be driven into the bottom beneath said body of water and said upper section containing an air chamber for imparting buoyancy thereto, yieldable means for holding said sections normally in axial alignment to accurately define the position thereof, and means for submerging said upper section and holding the same submerged to a depth below the maximum depth of ice in the winter season, said means including means for flooding said air chamber to destroy the buoyancy of said upper section.

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