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BUOY.

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1,295,008.

Patented Feb. 18, 1919.

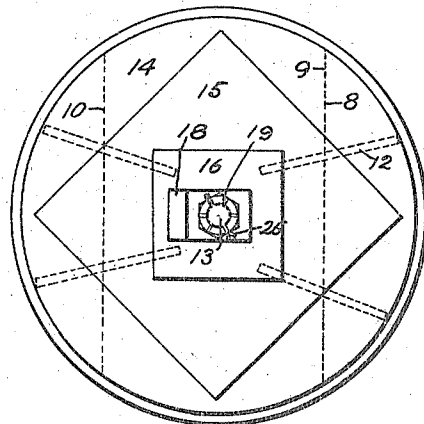
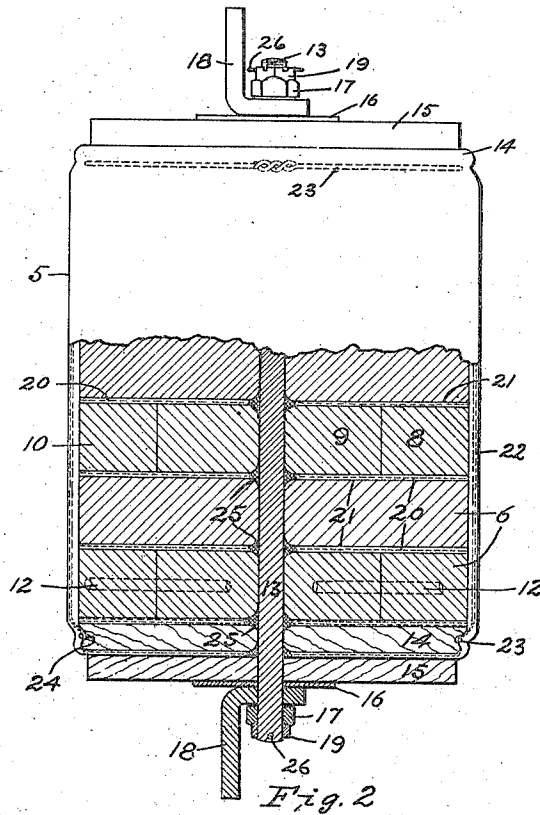


Fig. 1.

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To all whom it may concern:

Be it known that I, WILLIAM ANGUS CORLEY, a citizen of the United States, residing at Washington, District of Columbia, have invented new and useful Improvements in Buoys, of which the following is a specification.

This device relates to buoys, and more particularly to that type of buoys adapted for submerged use.

One of the objects of this invention, therefore, concerns a durable and reliable buoy particularly adapted for submerged use. A further object is to provide a simple and practical construction which may be subjected to water pressure when submerged without becoming water-logged. A further object is to provide a strong and substantial buoy adapted for submerged use which will withstand the rough usage to which it is to be subjected in operation without having its buoyancy effect materially diminished.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:—

Figure 1 shows a top plan view of my device, and Fig. 2 is a side view partly in section.

Buoys as heretofore used for submerged work have generally been of either hollow thin metal construction, or else made of wood or cork. The former was open to the disadvantage that floating wreckage, ice, etc., would frequently puncture the buoy so that it would fill up and sink. The ordinary buoys of wood or cork, as heretofore generally used, after being submerged for a certain period of time would become water-

logged and lose a large part of their buoyancy effect. To overcome these disadvantages, I have devised a buoy made up of a multiple of segments separated from each other by water-proofing means and protected by a suitable outer water-proofing coating. In use, should the outer water-proofing coating be punctured and any one of these sections become water-logged, the other sections would not be affected thereby, and the buoyancy effect of the entire buoy would not be greatly diminished.

The buoy 5 is preferably composed of a plurality of separate buoyant elements, or sections 6, which, when assembled, form a buoyant body. These elements are made up of any suitable light material that possesses a very high buoyant effect; balsa wood, for example, being very suitable for this purpose. In the buoy shown in the drawings, I have used six of such sections, but a greater or lesser number may be used as desired. The buoyant sections are preferably formed of a plurality of segments 8, 9, and 10, as best shown in Fig. 1 of the drawings, such segments being secured together by means of dowels 12. Each section may be water-proofed, as desired.

The separate buoyant sections composing the buoy are held together by any suitable means, such as a bolt 13 passing through each section and threaded at its ends. At each end of the buoy I provide suitable assembling means comprising disks or other suitably shaped members 14 and 15 made of some relatively hard material, as, for example, metal or hard wood, washer 16, nut 17, and locking nut 19, which locking nut after being threaded on the bolt is further secured in the customary manner by a cotter pin, or the like, 26, passing through an opening in the bolt and engaging slots in the outer face of the locking nut. Preferably disks 14 and 15 of hard wood are used and in such case I prefer that the grain of the blocks should run at right angles to each other to prevent warping thereof. To provide means for attaching the buoy to some other object, an angle iron, hook or eye, or other attaching means 18 is secured at one or both ends of the buoy, between the washer 16 and nut 17.

In order to particularly adapt the buoy for submerged use, suitable water-proofing means are desirable. For this purpose I provide layers of water-proof cloth 20 be-

tween each of the sections 6, which water-proof cloth is then covered with some suitable water-proof cement 21, for which purpose a tar or pitch composition will, for example, be found suitable. Such water-proofing means is also applied between the outer sections and members 14, as well as between members 14 and 15. The outer surfaces of section 6 and disks 14 are also protected by successive layers of water-proof cloth and water-proof cement so as to form a complete water-proof casing 22 for the separate buoyant sections 6 of the buoy. This water-proofing and cushioning means 22 is preferably of greater thickness than that between the separate sections, so as to provide that such casing will not be punctured on contact with floating wreckage, etc., and for this reason is composed of several alternate layers of cloth and cement. Such outer water-proof casing 22 is further secured at each end of the buoy to the disks 14 by means of steel wires 23 passing through such water-proofing means and tensioned and applied during the assembling. In order to more securely retain the water-proof cover 22 at this point, an outer annular groove 24 is provided in each of the disks 14 so that the wire when tensioned will fit tightly around and in such grooves. To insure that no water may seep along the bolt and affect the buoyancy of the sections composing the buoy, I have provided a suitable packing 25, such as asbestos composition, to surround the bolt at various points, preferably at the juncture of the various elements of the buoy. Thus it may be seen that by reason of the packing between each of the sections, such sections are effectively isolated from each other, so water reaching any one section by a puncture of the outer casing can not pass on into another section.

In assembling the buoy, the nut 17 and locking nut 19 are first applied to one end of the bolt. Attaching means 18 are next fitted on the bolt, and washer 16 and hard wood disk 15 then applied, hard wood disk 15 having been previously treated by some suitable composition to protect it from the deteriorating effect of water. Segments 8, 9, and 10, composing the various sections of the buoy, have also been previously treated by some suitable means to render them more on less water-proof, as for example, by boiling in paraffin, and are then doweled together and coated on the outside with a layer of water-proof cement. A layer of cloth is then applied over the layer of water-proof cement, and another layer of cement is applied on top of that. Each of the successive elements are then fitted on the bolt, disk 14, and then the succeeding sections 6 following one after the other, the packing 25 having in regular order been in-

serted between the junctures of the various elements. After all of the elements have been assembled, the buoy is placed in a press and highly compressed, after which the opposite washer 16, angle iron 18, nut 17, and locking nut 19 are applied, and the separate elements thus secured together. The outer coating, or water-proof casing 22, is now to be laid on, which is done by applying successive layers of water-proof cement and cloth to the surface of the buoyant sections. Securing wire 23 is then attached at either end of the buoy to fasten the outer casing 22 at such points, after which a further coating of water-proof cement is applied, and the buoy is now ready for service.

In operation the buoy may be either used as a float buoy, in which case only one attaching means need be used or it may be used, for example, in sustaining one of the communicating chains in a mine field, which use would necessarily maintain it in a submerged position. Water pressure against the outer surface of the buoy would have no effect, as each of the buoyancy elements are protected by water-proofing means and such water cannot reach the sections, nor effect their buoyancy. Should, however, drifting timber or ice puncture the outer casing 22 at any point and water reach that particular section 6 of the buoy, the water-proofing solution previously applied to the section would prevent to a large degree any deterioration of such section and any amount of water which might be taken up by that particular section would not reach any adjacent section, so would not materially alter the buoyancy effect of the entire buoy. At stated intervals the buoys may be taken up and examined, and any particular sections which have become affected by exposure to the water through the puncturing of the outer casing 22 may be replaced by other sections, the major part of the buoy being retained for use over again.

It must be understood that where desired the buoy may be formed of a single buoyant section 6, but in all other ways similar to the buoy before described, in which case I will still obtain a buoy satisfactory for many purposes and possessing the advantages of certain features of this invention.

It may thus be seen that the buoy will not become water-logged, nor take up water in its normal use and can be depended upon to retain under working conditions an almost uniform buoyancy effect over long periods of time.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the

generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

I claim as follows:

1. In a device of the character described, in combination, a plurality of buoyant sections, water-proofing means for separating said sections, an outer water-proofing covering for said buoyant sections, means for securing said sections together and a water-proofing packing surrounding said last named means at different points.

2. In a device of the character described, in combination, a plurality of buoyancy sections, water-proofing means for isolating said sections from each other, a water-proofing covering for the outside of said buoyancy sections, said water-proofing comprising alternate layers of water-proof cloth and water-proof cement, a bolt passing through said buoyancy sections for securing them together, and water-proofing packing means surrounding said bolt between the junctures of said sections.

3. In a device of the character described, in combination, a plurality of sections of buoyant material, water-proofing means isolating said sections, water-proofing means covering the outside of said sections, hard wood disks at either end of the sections, and a bolt for uniting the entire organization.

4. In a device of the character described, in combination, a plurality of buoyant sec-

tions, a plurality of disks of relatively hard material at each end of said sections, said disks and said sections being each separated from the other by water-proofing means, an outer water-proofing covering for said sections and wires for securing said covering to certain of the disks.

5. In a device of the character described, in combination, a plurality of buoyant elements, a plurality of disks of relatively hard material at either end of such sections, water-proofing means between said disks and said sections, outer annular grooves in certain of said disks, wire coöperating with said grooves for securing said outer water-proofing covering, means for securing said disks and sections together, an asbestos water-proofing packing surrounding said securing means at the junctures of said disks and sections, and attaching means for the device secured by said securing means.

6. In a device of the character described, in combination, a multiple of buoyant sections placed side by side, hard wood disks at either end of the sections, a bolt passing through said sections and said disks for uniting them to form a buoy, water-proofing means separating said sections and said disks, and a water-proofing covering for said buoy secured at either end to said hard wood disks, said disks being formed of a plurality of parts.

Signed at Washington, District of Columbia, this 18th day of April, 1918.

WILLIAM ANGUS CORLEY.