Sept. 10, 1968 C. R. DE FOREST 3,400,683

POSITIVE LOCKING DRAIN PLUG

Filed July 6, 1967

Fig. 4.

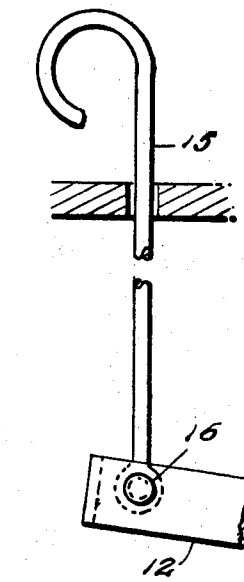


Fig. 1.

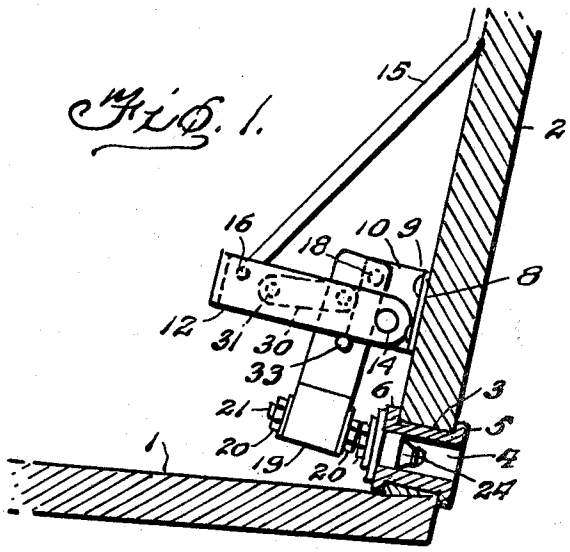


Fig. 2.

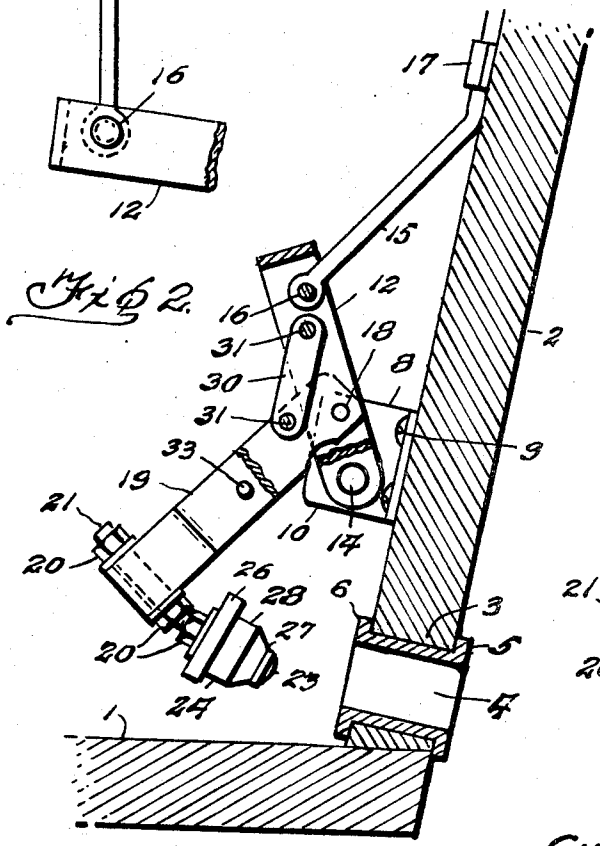
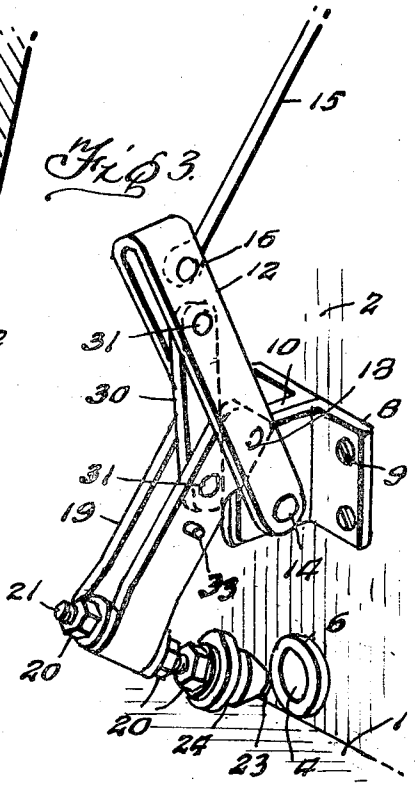


Fig. 3.



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POSITIVE LOCKING DRAIN PLUG

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ABSTRACT OF THE DISCLOSURE

The invention is directed primarily to a lever actuated toggle link pivotally positioning a drain plug selectively in open and closed positions, with a drain aperture in the transom of a boat, and retain the plug in locked open or closed positions.

This invention relates to positive marine drain plug and more particularly is directed to means for remotely operating a positive locking drain plug for boats in open and closed positions.

An object of this invention is to provide easy access to an operating lever to securely open and close a drain or sea-cock in the transom of a boat.

Another object of this invention is to provide a device of the class described for employment with all types of power operated boats, outboard, inboard, and inboard-outboard types as well as manually propelled boats, in which a drain aperture is provided in the transom near the bottom thereof and usually extremely difficult to reach for operation.

Another object of this invention is to provide means for remote operation of a marine drain plug of the class described for external operation of such plugs, when located in the transom near the bottom or floor, of the boat, under the engine, by providing a lever actuated toggle link pivotally acutating the drain plug in and out of the drain aperture.

Another object of this invention is to provide a device of the class decribed which will be simple and economical in construction and installation, and be efficient and durable in use.

The foregoing and other object and advantages of this invention will be more fully understood from the following specification, taking in conjunction with the drawings, forming a part thereof, wherein:

FIG. 1 is a side elevation of the device of this invention with the drain plug in closed position, parts shown in cross section for clarity;

FIG. 2 is a side elevation, similar to FIG. 1, with the drain plug in open position, part shown in cross section for clarity;

FIG. 3 is an angular view taken at approximately 45 degrees from the views of FIGS. 1 and 2 showing the drain plug midway between open and closed position; and,

FIG. 4 is a side elevation of a modification of the remote actuating lever positioned along the wall of a dry well.

Referring to the drawings, wherein like parts are given the same reference numeral, a boat bottom **1** has a transom **2** secured thereto, and near the joinder thereof the transom **2** has a drain hole or circular aperture **3**, therein. This basic type of construction is conventional for all types of powered craft, under 25 feet in length and is employed in some crafts over 25 feet in length, and is standard for inboard, outboard, inboard-outboard type vessels of metal, plastic, and wood, whether moulded, lapstake or marine plywood, or any combinations of these. The craft is usually delivered with a finished drain or aperture **3** having a brass ferrule **4** therein with a flange **5** formed external of the transom **2**, by grommet flanging methods and a flange **6** internal the transom **2**, sealing the ferrule

unit in water tight relationship with the transom **2**. The foregoing is standard and forms no part of this invention. Various means have been employed in the past for closing this aperture **3** when the boat is in use in the water. The prior devices lacked many convenient features supplied by this invention as well as positive locking remote operations.

The remote operation of the lever actuated toggle mechanism to selectively position the drain or closure plug in and out of the ferrule **4** forms the basis of this invention. A T-shaped bracket **8** is secured to the transom **2** in any suitable convenient manner, such as screws **9** with the flat head section of the T-shaped member adjacent and abutting the transom **2** and the leg **10** of this bracket extending inwardly into the boat. Pivotally mounted to the bracket leg **10** of the T-shaped bracket **8** is a U-shaped member **12** having the free ends thereof pivotally mounted to the bracket leg **10** with a pivot pin **14**. Near the closed end of this U-shaped member **12** is pivotally mounted an actuating rod or lever **15**, by a conventional pivot pin **16**. The lever or rod **15** has the terminal or pivotal end angularly displaced so that the greater length of the lever or rod **15** is slideably positioned adjacent the transom **2** for access and operation at the upper level of the transom or even above the transom. Suitable guide means, such as cylindrical guides **17** may be positioned along the transom for guiding the straight greater length of the rod or lever **15**; and the lever **15** may be mounted through the dry well, is illustrated in FIG. 4.

Pivotally mounted by a conventional pivot pin **18**, intermediate the aforesaid pivots **14** and **16**, are the open ends of a U-shaped plug lever **19**. Removably mounted, by compression of threaded engagement of nuts **20** positioned on each side of the U-shaped drain plug lever **19**, is a rod **21** having threaded end portions to receive the nuts **20** for compression mounting one end of the rod **21** to the plug lever **19** and for mounting the drain plug on the other end thereof. The drain plug **24** may be secured to the free end of the drain plug rod **21** in any suitable convenient manner, such as using nuts **20**, to compress the plug **24** therebetween; also, the free end of the rod **21** may be tapped to receive a stud bolt **23** on the free end thereof for securing the plug **24** to the rod **21** and abutting a nut **20** thereon.

Any drain plug **24** may be used, but the preferred plug **24** is of a particular configuration, being provided with a flange **26** to abut the internally positioned flange **6** of the ferrule **4**. The outwardly extending extremity **27** of the plug **24** is provided with a tapering surface for ease in inserting into the ferrule **4** with the central portion **28** is of a slightly outwardly tapering design.

The positive locking feature of the actuating mechanism is a toggle link **30** having one end thereof pivotally connected by a pivot pin **31** to the U-shaped member **12**, intermediate the pivot points **14** and **16** therein; and, the other end of the toggle link **30** is pivotally connected by a similar pivot pin **31** to the U-shaped plug lever **19**. The toggle link **30** is of such a length and so positioned that when the actuating rod or lever **15** is depressed or pushed down, pivoting the pivotally interconnected parts, the longitduinal axis of the toggle link **30** is angularly disposed with respect to the axis of pivots **14** and **16** in the U-shaped member **12**, and the pivot **31** in said member **12** is below said axis of pivots **14** and **16**, urging the drain plug **24** into the ferrule **4**. A stop pin **31** is inserted in the drain plug lever **19** to abut the U-shaped member **12**, when the mechanism is pivoted to position the drain plug in closed position, to limit movement of the toggle link **30** urging the plug further than necessary to effect closed position in the ferrule **4**. When the actuating rod or lever **15** is lifted or raised, pivoting the

interconnected members, the pivot link **30** is pivoted so that it is urging the drain plug **24** and drain plug lever **19** away from the ferrule **4**, when the actuating rod or lever **15** has been raised sufficiently to pivot the longitudinal axis of the toggle link **30** passed mid-point or angularly disposed above the axis of the pivots **14** and **16**. The length of the toggle link **30** and the positioning of the pivot points **31** thereof will determine the length or distance that the actuating rod or lever **15** must be moved to make the pivoted toggle link **30** effective to lock the drain plug **24** in closed position with respect to the ferrule **4**, and to lock the drain plug **24** in open position with respect to the ferrule **4**.

The invention has been described in great detail for a specific application with specific parts. It is understood however that the invention is not so limited as it can be used in other types of boat construction, in other positions, and many modifications and changes can be made in the specific operative mechanism without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described the invention what is claimed, and is desired to secure by the grant of United States Letters Patent is:

1. In combination with a boat having a drain aperture, a remote controlled positive locking drain plug, comprising a plug adapted to close the drain aperture, a bracket, a pair of overlapping elongated lever members pivotally connected to said bracket, a rod connecting one of said lever members and said plug, an actuating lever pivotally

connected to the other said lever member, and a toggle link pivotally connected to each of said pair of lever members and so positioned that the longitudinal axis said toggle link is angularly disposed with respect to the axis of the pivot point of the lever member having the actuating lever pivoted thereto when the actuating lever is moved in a direction to position the plug in the said aperture.

2. The device of claim **1** wherein said plug connected to one of the lever members is connected by means of a rod having an arcuate portion.

3. The device of claim **1** wherein said pair of elongated lever members are U-shaped.

4. The device of claim **1** provided with a stop pin positioned on one of said pair of lever members, to abut the other of said lever members when the drain plug is engaged in said aperture.

5. The device of claim **1** wherein said toggle link is such length and so positioned as to urge the said plug towards said aperture when the actuating lever is moved in one direction, and to urge the said plug away from said aperture when said actuating lever is moved in the opposite direction.

References Cited

UNITED STATES PATENTS

3,217,685 11/1965 Mueller ---------- 114—183

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