Aug. 29, 1961 A. MOELLER 2,997,975

BOAT DRAIN PLUG

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Fig. 1

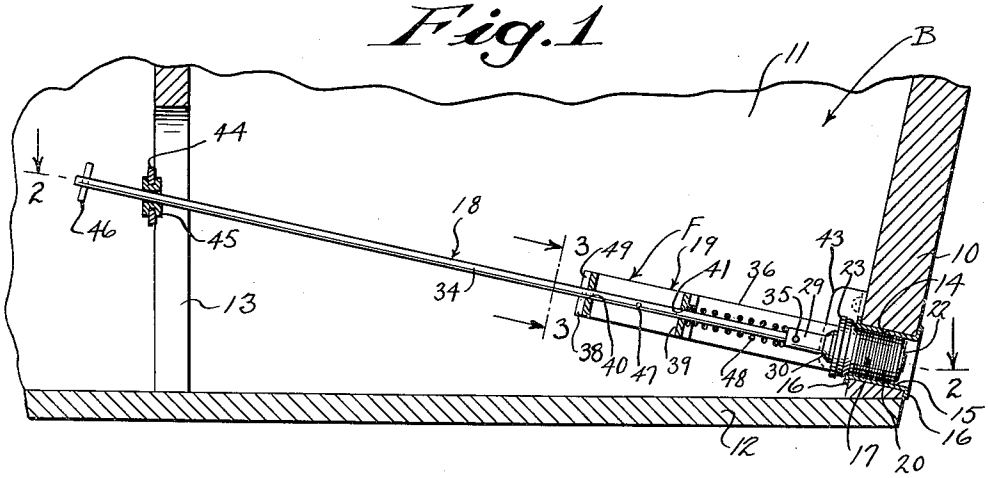
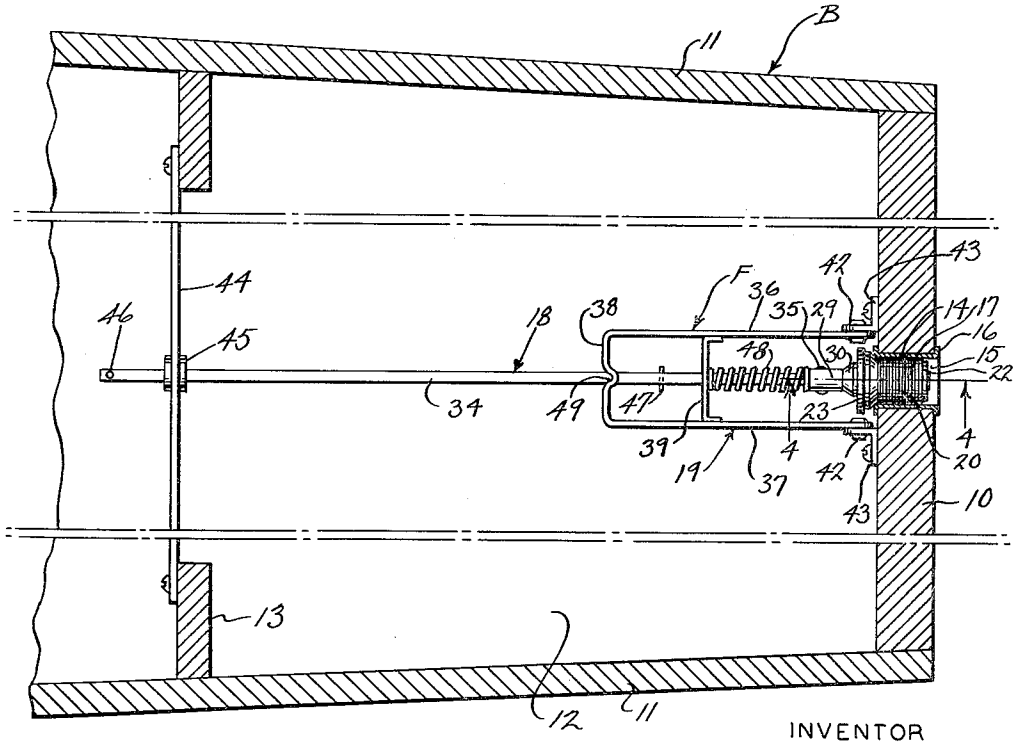


Fig. 2



INVENTOR
AXEL MOELLER

BY

Young and Wright

ATTORNEYS

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Fig. 3

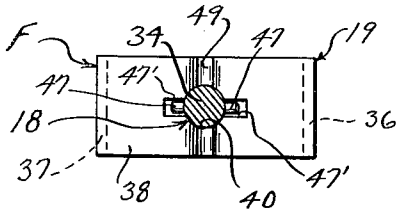


Fig. 4

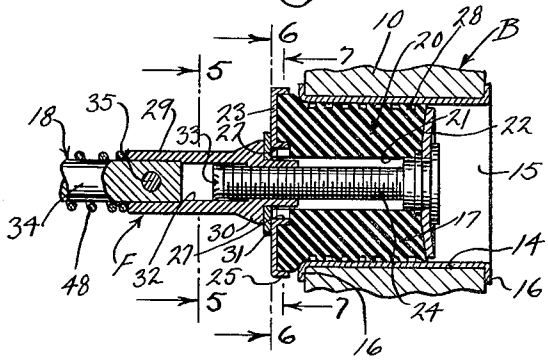


Fig. 5

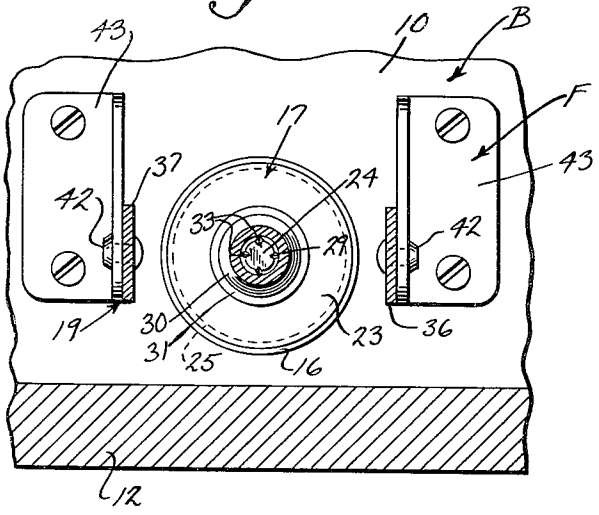


Fig. 6

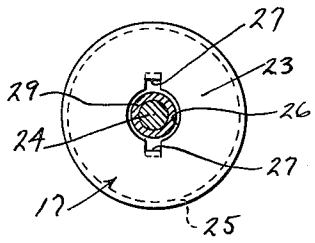
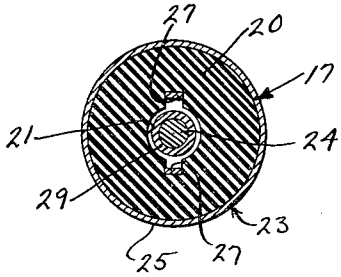


Fig. 7



INVENTOR
AXEL MOELLER

BY Young and Wright

ATTORNEYS

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2,997,975

BOAT DRAIN PLUG

Axel Moeller, Racine, Wis., assignor to Moeller Mfg. Co., Inc., Racine, Wis.

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6 Claims. (Cl. 114—183)

This invention appertains to boats and boat fittings, and more particularly to a novel plug or stopper for the water drain opening in the stern of a boat.

One of the primary objects of my invention is to provide an improved expansion stopper of the general type shown in my prior Patents Nos. 2,292,149; 2,315,538; 2,347,835; 2,685,380 and 2,729,353, issued respectively on August 4, 1942; April 6, 1943; May 2, 1944; August 3, 1954, and January 3, 1956, with a novel means for operating the stopper from a point distant from the drain opening.

In small boats, much difficulty is experienced in placing and removing the drain plug from the drain opening in the stern of the boat. Usually the opening is under and in back of the stern seat. This necessitates the bending down and groping for the plug and the tightening and loosening of the plug is uncertain.

It is therefore, another salient object of my invention to provide a novel and efficient means for operating the plug from the front of the stern seat, with a positive means for guiding the plug into and out of the drain opening.

A further important object of my invention is to provide means whereby the plug, its support and guiding means and its operating rod can be efficiently lined up with the drain opening after the boring of said opening, so that the easy installation of the device is insured, with correct operating results.

A still further important object of the invention is to provide means for preventing accidental separation of the plug body from the operating rod, so that loss of the body is prevented, with means for lubricating the threads of the operating nut and adjusting screw for the plug body.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described and claimed, and illustrated in the accompanying drawings, in which drawings,

FIGURE 1 is a fragmentary longitudinal sectional view through the stern of a boat showing my novel device incorporated therewith;

FIGURE 2 is a horizontal sectional view through the stern of a boat showing my improved device incorporated therewith, the section being taken on the line 2—2 of FIGURE 1, looking in the direction of the arrows;

FIGURE 3 is a detail transverse sectional view taken through my device on the line 3—3 of FIGURE 1, looking in the direction of the arrows, and illustrating more particularly the means employed for holding the plug and its operating rod in a retracted position for permitting the draining of the boat;

FIGURE 4 is a fragmentary longitudinal sectional view taken on the line 4—4 of FIGURE 2, looking in the direction of the arrows, the view illustrating more particularly the structure of the plug;

FIGURE 5 is a transverse sectional view through the device taken on the line 5—5 of FIGURE 4, looking in the direction of the arrows and illustrating more particularly the adjustment of the guiding and supporting means for the plug and operating rod;

FIGURE 6 is a detail transverse sectional view taken on the line 6—6 of FIGURE 4, looking in the direction of the arrows, and illustrating more particularly the connection of the outer compression plate of the stopper

with the body of the stopper to prevent turning of these parts relative to one another, and

FIGURE 7 is a transverse sectional view through the stopper portion of the device, the section being taken on the line 7—7 of FIGURE 4, looking in the direction of the arrows, the view also showing the means for interconnecting the outer compression plate with the stopper or plug body.

Referring more particularly to the drawings, wherein similar reference characters designate corresponding parts throughout the several views, the letter F generally indicates my novel fitting for a boat B.

The boat B forms no part of the present invention and can be of any desired type or make. As illustrated, the same includes a stern board **10**, sides **11** and a bottom **12**. The boat can be provided with a stern seat (not shown), and the seat can be supported at its forward end by a transversely extending seat brace board **13**. In accordance with my invention, the stern board **10** has bored therein, at an angle, adjacent to the bottom **12** of the boat, a drain opening **14**. The drain opening **14** has fitted therein a metal thimble or sleeve **15** and the opposite ends of the sleeve or thimble are upset, as at **16**, against the opposite faces of the stern board. The sleeve or thimble **15** is desirable so that swelling or contraction of the stern board **10** will not alter the size or interior diameter of the opening.

My novel fitting F includes a plug **17** for sealing the drain opening, an operating mechanism **18** therefor and a support and guide means **19** for the operating means **18** and the plug **17**.

The plug **17**, as stated, can be of the general type shown in my mentioned patents, and the plug includes a resilient compressible stopper body **20**. This body is provided with an axial bore **21** and the body is confined between inner and outer compression plates **22** and **23**. Rigidly secured to the inner compression plate **22** is a threaded stem **24** which extends entirely through and beyond the body **20**.

The outer compression plate **23** is provided with an annular skirt **25** which receives and confines the outer end of the stopper body. The axial center of the compression plate **23** is provided with an opening **26** through the threaded stem extends. The plate **23** on each side of the opening **26** is provided with struck in ears **27** which firmly grip the plug body **20** so that independent rotation of the stopper body and the compression plate **23** will be prevented. As shown in certain of my prior patents, the outer surface of the body **20** is provided with annular compression rings **28**.

Threaded on the stem **24** is an elongated adjusting sleeve nut **29** and this sleeve nut at its inner end is preferably provided with a bearing head **30** for rotatably engaging the outer compression plate **23**. If desired, a bearing washer **31** can be interposed between the plate **23** and the bearing head **30**. It is to be noted that a part of the nut **29** extends through the bearing washer **31** and into the plug body. The interior of the elongated sleeve nut **29** beyond the threaded portion thereof is enlarged to provide a chamber **32** which can be packed with grease so that during the threading of the nut **29** on the stem **24** the threads of the stem and the nut will be lubricated. The forward end of the stem is upset, as at **33**, and hence this end is of a slightly greater diameter than the diameter of the threaded portion of the nut. Hence, accidental unthreading of the nut from the stem is prevented. This eliminates the possibility of separation of the plug from the remaining portions of the fitting. The forward end of the chamber **32** is closed by an elongated operating rod **34** and the rod can be secured to the nut by means of a cross-pin **35**. Thus, turning movement of the rod **34** can be imparted to the sleeve nut.

The rod 34 constitutes the main part of the operating portion 18 of the fitting.

The guiding and supporting means 19 for the fitting includes a main supporting and guide bracket 36. This bracket is of a U-shape in plan and includes spaced parallel longitudinally extending legs 37 and a forward connecting bight or strap 38. The legs 37 are connected and braced by a transversely extending strap 39 arranged in spaced relation to the front strap 38. The straps 38 and 39 are provided respectively with aligned guide openings 40 and 41. The operating rod 34 slidably and rotatably extends through these openings. The rear ends of the legs 37 are pivotally connected by rivets or the like 42 with angle brackets 43, which are in turn secured to the inner face of the stern board 10 by suitable fastening elements, such as screws. The extreme forward end of the rod is supported and guided by a cross-brace 44 which is secured to the seat brace 13. The cross-brace 44 is provided with a bearing sleeve 45 or the like for receiving the rod. A suitable handle 46 is connected with the extreme forward end of the rod 34 and this handle is arranged in front of the seat brace 13 and hence is easily accessible.

Coiled about the rod 34 is an expansion spring 48 and this spring is confined between the inner cross-brace 39 and the sleeve nut 29 and normally functions to urge the plug 17 into the sleeve 15. Upon loosening of the plug, as will be later set forth, the same can be pulled out of the sleeve by grasping and pulling forward on the rod 34. In order to hold the plug 17 out of the sleeve, the rod 34 is provided with a cross-pin 47. The front cross-strap 38 of the bracket 36 on each side of the guide opening 40 is provided with a slot 47' and hence the pin 47 can be pulled through the slot 47' and in front of the bracket 36. The front of the brace 38 on each side of the opening 40 is provided with a seat 49 and when the pin 47 is pulled through the slots 47' the rod 34 can be turned so that the pin 48 will fit in the seats 49 and thus retain the rod 34 in a forward position with the plug out of the sleeve 15.

In the installation of my fitting, the opening 14 is bored at a downward and inclined angle and the sleeve 15 is placed in the opening. The bracket 36 with the rod 34 and the plug 17 is now placed in position and the angle brackets 43 are secured to the stern board on each side of the sleeve. The bracket 36 can be swung on its pivots 42 until the rod and plug are aligned exactly with the axial center of the sleeve, at which time the supporting brace 44 is secured in proper position on the seat brace 13. By this arrangement, the device can be easily installed on a boat and all parts properly aligned.

In use of my fitting and considering that the plug is out of the sleeve, then the rod 34 is turned so as to align its cross-pin 47 with the slots 47' at which time the spring 48 will urge the plug into the sleeve. The rod 34 can be forcibly pushed toward the stern board so as to insure the proper seating of the plug within the sleeve. The rod can now be turned so as to thread the nut 29 on the stem 24. This will bring the compression plates 22 and 23 toward one another to compress the body 20 longitudinally and this will deform the body circumferentially and into firm sealing contact with the wall of the sleeve 15.

When it is desired to pull the plug from the sleeve to drain the boat, it is merely necessary to turn the rod 34 in a reverse direction to feed the nut 29 toward the forward end of the stem, so as to loosen the plug in the sleeve. The rod can now be pulled forwardly and the plug will slide out of the sleeve and the plug can be held out of the sleeve by the means just previously described.

Various changes in details may be made without departing from the spirit or the scope of this invention but what I claim as new is:

1. In a boat having a stern board provided with a drain opening and a seat brace in spaced relationship to the stern board, an expansion plug for movement into and out of the opening including a compressible body, inner and outer compression plates engaging the opposite ends of the body, a threaded stem carried by the inner compression plate extending through the body, a sleeve nut threaded on the stem and bearing against the outer face of the outer compression plate for moving said plates toward and away from each other for compressing and releasing the body, a forwardly extending operating rod rigidly secured to the nut for rotating said nut and for moving the plug into and out of the opening, a U-shaped guide bracket slidably and rotatably supporting the rear end of the rod, a support for the guide bracket secured to the inner face of the stern board on each side of the opening, and a front guide and support brace rotatably and slidably supporting the front end of the rod carried by the seat brace whereby said rod is slidably and rotatably carried and supported in said guide bracket and said supporting brace, whereby turning of said rod will expand and compress said compressible body and sliding of the rod will move said body into and out of the opening.

2. In a boat as set forth in claim 1 and said guide bracket being pivotally secured to its support, whereby the bracket can be swung to a desired angle relative to the stern board and to the angle of the opening.

3. In a boat as set forth in claim 1, and spring means normally urging the rod and plug toward the opening.

4. In a boat as defined in claim 3, and cooperating means on said rod and said guide bracket for holding said rod in an adjusted forward position against the tension of the spring with the plug out of the opening.

5. In a boat as defined in claim 4, and said last named means including a cross-pin on the rod and a seat on the guide bracket for receiving said pin when the rod and pin are moved forward.

6. In a boat as defined in claim 1 and said nut having an interior chamber of greater diameter than the threaded stem and threaded portion of said nut, and the inner end of said stem being upset to a greater diameter than the threaded portion of the nut to prevent displacement of the nut off of the stem.

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