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A. F. THORSTEN

CLAPPER VALVE

Filed April 18, 1922

Fig. 1.

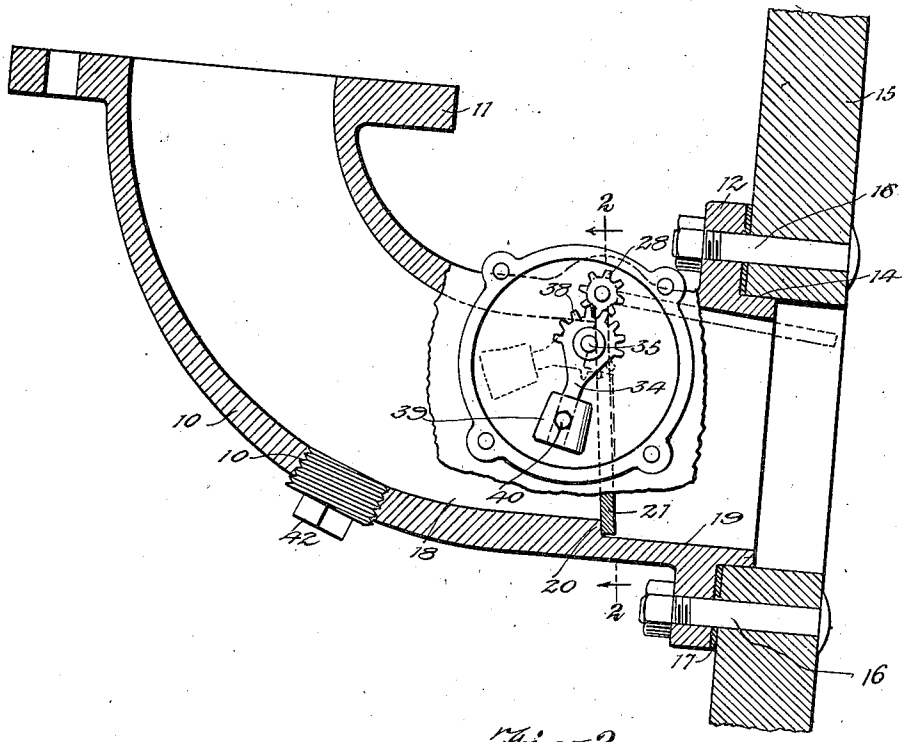
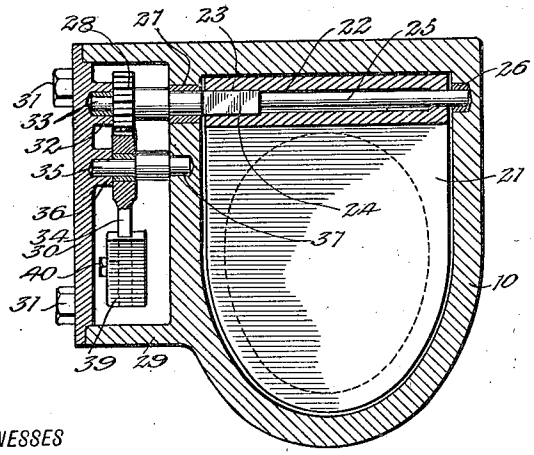


Fig. 2



WITNESSES

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UNITED STATES PATENT OFFICE.

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CLAPPER VALVE.

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To all whom it may concern:

Be it known that I, ALFRED F. THORSTEN, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Clapper Valve, of which the following is a full, clear, and exact description.

This invention has relation to valves and has particular reference to an improvement in clapper valves which are especially designed for outboard discharges of soil, waste, and scupper discharge pipes of ships.

When a valve of this character is to be connected on an angle at a ship's side, the practice now in vogue is to construct a special model so that the clapper or closing element will be placed in a vertical position when closed, thus necessitating the individual casting of each model in a foundry and the finishing of the same in a machine shop.

The present invention aims as an object to produce a clapper valve which is so constructed that it remains closed at any angle from the horizontal to the vertical.

Furthermore the invention contemplates a clapper valve which, irrespective of the rolling or plunging of a ship in severe weather, remains closed to overcome the tendency of the clapper or closing element of valves now in use, to open and close with the rolling motion of the ship and the resultant discomforts and disadvantages incident thereto.

As a further object the invention contemplates in a valve of the character described a clapper or closing element which requires a minimum amount of water to effect its opening.

As a still further object the invention contemplates in a valve of the character set forth a clapper or closing element which is disposed wholly within the ship's side at all times to eliminate the breakage of the same when the ship is docking.

As a further object the invention includes a clean-out which permits of the clearing of a possible stoppage irrespective or whether the valve is above or below the water line to eliminate the necessity of lowering a man over the ship's side for this purpose as is now the custom.

The invention furthermore contemplates a self-cleaning valve due to the fact that the parts for actuating the valve are arranged exterior and out of the passage or waterway.

The invention furthermore contemplates a device of the character described which is simple in its construction, inexpensive to manufacture, and which is strong and durable.

With the above recited and other objects in view, the invention resides in the novel construction set forth in the following specification, particularly pointed out in the appended claims and illustrated in the accompany drawings, it being understood that the right is reserved to embodiments other than those actually illustrated herein to the full extent indicated by the general meaning of the terms in which the claims are expressed.

In the drawing—

Figure 1 is a longitudinal sectional view through a clapper valve constructed in accordance with the invention, parts being shown in side elevation.

Fig. 2 is a transverse sectional view therethrough taken approximately on the line 2—2 of Fig. 1.

Referring to the drawings by characters of reference, 10 designates the body of the valve which is here illustrated as a tubular elbow constructed preferably of cast iron or any other suitable material. The inner end of the valve body is provided with an enlarged flange 11 for uniting the pipe to the fixtures with which it is to be associated. The valve is formed adjacent its outer end with a flange 12 which is spaced from said outer end to provide beyond the flange a substantially annular projecting boss 13 which is designed to be received by an opening 14 in the side of the hull 15 of the ship. Bolts 16 are passed through the flange and the ship's side and preferably a sealing gasket 17 is interposed between the flange and the side of the ship to prevent leakage. The outer end of the bore 18 is rabbeted or enlarged as at 19 to provide at the juncture with the bore 18 an internal shoulder 20 which is preferably inclined or canted from the vertical. The clapper or closing element 21 is of an appropriate size and configuration to snugly fit and operate in the enlarged or rabbeted portion 19 of the bore and the same is formed adjacent its upper end with a transverse opening 22 which is preferably squared as at 23 to receive the squared portion 24 of a shaft 25. The outer free end of the shaft 25 is journaled in a bearing 26 in the side wall of the body 10. The opposite end of the shaft extends

through a bearing bushing 27 in the opposite wall of the body 10 and has secured thereon a pinion 28. The side of the valve body at which the pinion 28 is arranged is formed with a circular housing 29 which is cast or otherwise formed thereon and said housing is closed by a cover plate 30 which is secured in covering relation thereto by the bolts or screws 31. The cover plate is formed with a bearing boss 32 within which the outer extremity 33 of the shaft 25 is journaled. A weighted arm 34 is secured to a stub shaft 35 which is transversely arranged in the housing 29 with its outer extremity journaled in a bearing boss 36 on the cover plate and its inner extremity journaled in a bearing opening 37 in the outer surface of the side wall of the body 10. The bearing arm is provided with an arcuate series of rack teeth 38 concentric to its shaft 35, which rack teeth mesh with the teeth of the pinion 28. The outer free extremity of the arm 34 has mounted thereon an adjustable and detachable weight 39 secured in place by a set screw 40. The weighted end of the arm 34 is disposed in a normal position to effect, through the engagement of the rack teeth 38 with the pinion 28, a normal seating of the clapper or closing element 21 against the shoulder 20 irrespective of the rolling or pitching of the ship and the angle at which the valve is disposed. The valve body is provided with a threaded opening 41 which receives a threaded closure plug 42 to afford, when the closure plug is removed, a clean-out for removing stoppages or obstructions lodging within the valve body.

In use and operation the weight 39 serves to gravitationally maintain the clapper or closing member 21 seated against the shoulder or seat 20 due to the interengagement of the rack teeth 38 with the pinion 28 whereby the shaft 25 is maintained against rotation. The discharge of soil, waste or the like through the bore 18 of the valve serves to effect relative swinging movement of the clapper or closing element away from its seat to permit of the exit of the same from the ship's side. The weight is sufficient to slightly overbalance and effect the normal seating of the clapper whereby a minimum amount of pressure only is required to open the same from the inside, while external pressure against the outer side of the clapper serves to resist the possible entrance of water to the bore 18 or the fixtures and pipes connected to the inner end of the valve body. Under this arrangement and construction the valve may be attached to dispose the clapper at any angle between the horizontal and vertical, while the gravitational closing mechanism functions to retain the clapper in closed position. This eliminates the necessity under the present practice of the requirement of special castings conforming to the various angles of the hulls of each ship with which the valve is associated whereby the clapper or closing element is maintained vertical.

I claim:

1. A clapper valve for the outboard discharge of soil, waste, or the like, from ships, comprising a valve casing having an inner restricted bore and an outer relatively enlarged bore forming at their juncture an internal shoulder constituting a seat, a clapper swingingly mounted within the enlarged bore adjacent said seat for inward swinging movement thereagainst to a closed position, a shaft connected to said clapper and extending through one of the side walls of the casing for swingingly mounting said clapper therein, a weighted element mounted for swinging movement exteriorly of the casing and adjacent the protruding extremity of the shaft, interengageable means on the protruding extremity of said shaft and said weighted element for gravitationally rotating the shaft to normally effect the closing of the clapper against its seat, and a housing provided on the side of said casing for housing the exteriorly disposed elements.

2. A clapper valve for the outboard discharge of soil, waste, or the like, from ships, comprising a valve casing having an inner restricted bore and an outer relatively enlarged bore forming at their juncture an internal shoulder constituting a seat, a clapper swingingly mounted within the enlarged bore adjacent said seat for inward swinging movement thereagainst to a closed position, a shaft connected to said clapper and extending through one of the side walls of the casing for swingingly mounting said clapper therein, a weighted element mounted for swinging movement exteriorly of the casing and adjacent the protruding extremity of the shaft, interengageable means on the protruding extremity of said shaft and said weighted element for gravitationally rotating the shaft to normally effect the closing of the clapper against its seat, and a housing provided on the side of said casing for housing the exteriorly disposed elements, said housing having a removable cover plate.

3. A clapper valve for the outboard discharge of soil, waste, or the like, from ships, comprising a valve casing having an inner restricted bore and an outer relatively enlarged bore forming at their juncture an internal shoulder constituting a seat, a clapper swingingly mounted within the enlarged bore adjacent said seat for inward swinging movement thereagainst to a closed position, a shaft connected to said clapper and extending through one of the side walls of the casing for swingingly mounting said clapper therein, a pinion secured to the protruding extremity of said shaft, an arm pivoted ex-

teriorly of said casing and adjacent said pinion, an arcuate series of concentric rack teeth carried by said arm and meshing with said pinion, and a weight detachably and adjustably associated with the free extremity of said arm, as and for the purpose specified.

4. A clapper valve for the outboard discharge of soil, waste, or the like, from ships, comprising a valve casing having an inner restricted bore and an outer relatively enlarged bore forming at their juncture an internal shoulder constituting a seat, a clapper swingingly mounted within the enlarged bore adjacent said seat for inward swinging movement thereagainst to a closed position, a shaft connected to said clapper and extending through one of the side walls of the casing for swingingly mounting said clapper therein, a pinion secured to the protruding extremity of said shaft, an arm pivoted exteriorly of said casing and adjacent said pinion, an arcuate series of concentric rack teeth carried by said arm and meshing with said pinion, a weight detachably and adjustably associated with the free extremity of said arm, a housing formed on the side of said valve casing, a removable cover plate attached thereover, and a bearing boss at the inner side of said cover plate for receiving the outer extremity of the shaft and said pinion.

ALFRED F. THORSTEN.