Aug. 30, 1938. A. L. LAMBERT 2,128,305

RETAINING MEANS

Filed March 5, 1937

Fig. 1

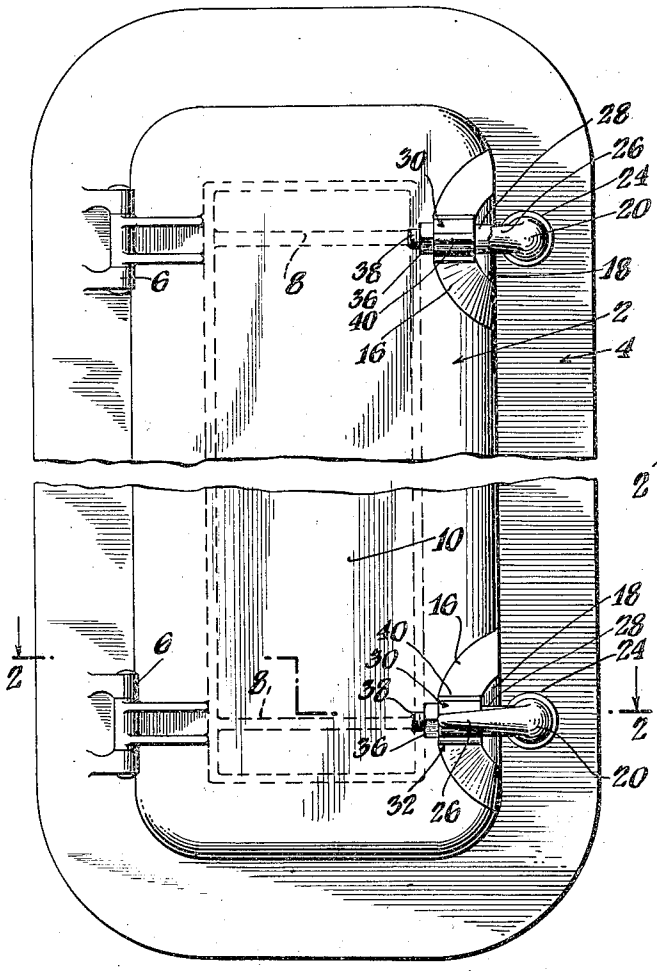


Fig. 3

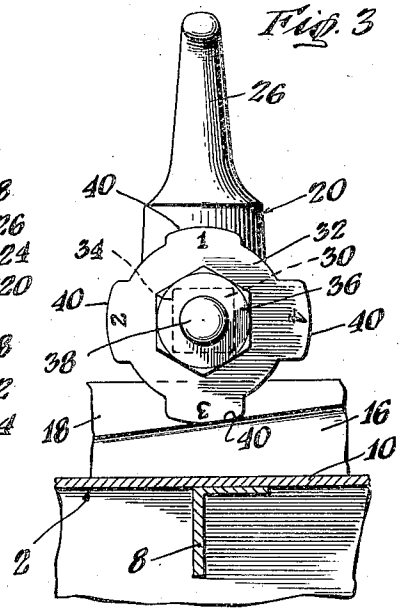


Fig. 4

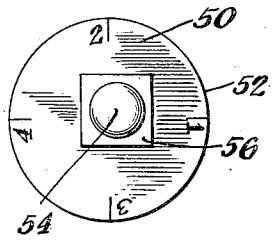
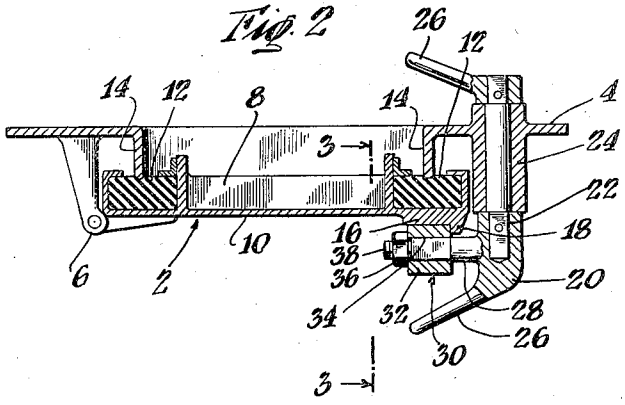


Fig. 2



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Patented Aug. 30, 1938

2,128,305

UNITED STATES PATENT OFFICE

2,128,305

RETAINING MEANS

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Application March 5, 1937, Serial No. 129,125

9 Claims. (Cl. 292—241)

This invention relates to retaining means such as dogging devices for use on doors, hatches, and other closures, and while the invention is of general application it is particularly applicable to constructions such as water-tight bulkhead doors and other structures wherein it is desired to urge a closure against a seat to compress a gasket.

A conventional type of dogging means heretofore used for tightening doors and the like is formed with a wedge-shaped surface located on the door and positioned to be engaged by a camming surface or member carried by a dog pivotally mounted adjacent the edge of the door. When the dog is moved about its pivot the camming member engages the wedge to urge the door or closure against its seat, compressing the gasket.

On continued use of such constructions, the gasket tends to become compressed or grooved so that the door is not urged against the gasket or against its seat with the desired force. Furthermore, when several dogging means are located about the margin of a closure, warping of the closure may cause certain of the dogging means to be subjected to greater strain than others.

In accordance with the present invention, these disadvantages and objections to constructions of the prior art are overcome by the use of means adjustable to urge the door or closure against its seat with the desired pressure and under all conditions of use, either when the closure is first installed or after the gasket has become compressed or grooved or the door has become slightly warped. This result may be obtained in various ways but as hereinafter described and as shown in the figures of the accompanying drawing, this may be accomplished by providing the dog with adjustable camming means for engaging a wedge on the door or closure. The camming means may be adjusted as required to alter the position of that portion thereof engaging the wedge so as to space the wedge and dogging means different distances apart when the dogging member is moved to a predetermined position. In this way the pressure applied to the closure and gasket may be varied as necessary to insure sealing of the closure.

One of the objects of the present invention is to provide novel dogging means for a door or closure variable to insure proper sealing of a closure.

Another object of the invention is to provide a dogging member with adjustable means thereon for engaging a portion of a door or closure to retain the closure in engagement with its seat.

A further object of the invention is to provide a water-tight door with novel means for insuring firm engagement of the door with its seat to provide a water-tight joint therebetween.

Another object of the invention is to insure a tight joint between a gasket and means engaging the gasket both when the gasket is first installed and after it has been compressed or grooved.

These and other objects and features of the invention will appear from the following description thereof, in which reference is made to the accompanying figures of the drawing which illustrates typical embodiments of the invention as applied to water-tight closures.

In the drawing:

Fig. 1 is an elevation of a water-tight door having dogging means embodying the present invention;

Fig. 2 is a horizontal sectional view of the means illustrated in Fig. 1, taken on the line 2—2 thereof;

Fig. 3 is a view of the detail of the construction illustrated in Fig. 2, taken on the line 3—3 of Fig. 2; and

Fig. 4 is an end view of an alternative form of camming means embodying the present invention.

In that form of the invention chosen in order to illustrate a typical embodiment thereof, and shown in Figs. 1 to 4 of the drawing, a water-tight door 2 is mounted for movement relative to a bulkhead frame 4 for closing an opening therein. The door is pivotally mounted on hinges 6 and preferably is provided with stiffening ribs 8 for supporting a central panel 10, although obviously the door may be of any other desired or convenient construction preferred.

A gasket 12 is located between the marginal portion of the door and the frame and may be carried by the door so that when the door is closed and the gasket 12 engages an abutment 14 formed on the bulkhead frame a water-tight seal is provided between the door and the frame. The door may be provided with any desired number of arcuate wedge members 16 which, as shown in Fig. 3, are inclined with respect to the face of the door or closure by which they are carried, and are located adjacent the margin of the door on the opposite face thereof from the gasket 12. The members 16, may, if desired, be formed with projecting retaining means 18 adjacent the outer margins thereof for preventing the door from

springing inward when subjected to heavy pressure.

Dogging members **20** are provided for urging the door or closure against the abutment **14** to compress the gasket **12** and provide a tight seal capable of preventing the passage of water between the gasket and the abutment. Any desired number of dogging members may be employed and these may be located at spaced points about the margins of the door as desired, to insure firm engagement of the rubber gasket with the abutment. As shown in Fig. 2, each dogging member is provided with a shaft **22** which extends through a sleeve **24** fixed in the bulkhead frame. The shaft **22** may be suitably packed or otherwise formed to prevent the passage of water through the sleeve and about the shaft as is usual in such constructions, and operating handles **26** may be secured to the dogging members so that they may be manipulated from either side of the door.

The dogging member **20** is provided with a projecting cam support **28** which extends inward over the wedge-shaped members on the door and is provided with a polygonal shank portion **30**, which, as illustrated, may have four sides, although it will be apparent that it may be in the form of any other desired polygon. The camming means or member **32** is formed with a central opening **34** similar in shape to that of the shank portion **30** so that the camming means when positioned on the shank is held against rotation. A nut **36**, or other suitable retaining means, secured to the threaded end **38** of the shank serves to prevent longitudinal displacement of the camming member.

The camming member **32** is formed with a plurality of camming surfaces **40** which are located unequal distances from the axis of shank **28**. Preferably the camming means is provided with one camming surface **40** for each side of the polygonal portion **30** of the shank and each of these surfaces may be positioned to engage the adjacent surface of a wedge **16**. When the camming member is in the position illustrated in Fig. 3 one of the engaging portions identified as "3" will engage the wedge **16** to urge the door into its closed position and to force gasket **12** against the abutment **14**. The bearing surface of the engaging portions identified as "1" and "2" are located at progressively shorter distances from the axis of the shank whereas the surface of the portion "4" lies at a greater distance from the axis of the shank than does the portion "3".

In the event the gasket becomes compressed or grooved it is possible, when using the construction described, to effect the desired compression of the gasket to secure a tight seal between the door and frame by removing the nut **36** and turning the camming member **28** through an angle of 90°. The camming surfaces designated "4" then may be placed in position to bear against the wedge **16** and since the radial distance of the surface "4" from the axis of the shank is greater than the radial distance of the surface "3" the camming means will urge the wedge **16** further from the dogging member and the door and gasket will be urged further toward the abutment **14** on rotation of the dogging member into a predetermined position. Similarly, the camming surfaces designated "1" and "2" may be positioned to engage the wedge **16** if it is desirable to apply less compression to the gasket or to relieve strain on the dogging means.

Preferably, the dogging members **20** and wedges **16** are located adjacent the strengthening members **8** on the door so as to apply the dogging force to an inflexible portion of the construction, avoiding any tendencies to distort the marginal rim of the door due to the action of the dogging members thereon. However, it will be evident that the dogging means may be located in other positions and wherever necessary or desirable to insure the desired sealing of the closure.

It will also be evident that the camming means may be formed as desired for applying selectively variable pressure to the door and gasket. As illustrated in Fig. 4, a circular camming member **50** may be used and may present an outer surface **52** eccentric to the axis **54** of the shank **56**. The portions designated "1", "2", "3" and "4" of the surface of the camming means **50** are located at progressively increasing distances from the axis of the shank and may be selectively positioned to engage a wedge-shaped surface for applying the desired force to a closure on movement of the dogging means to a predetermined position.

Other forms of camming means and dogging members and other types of wedge-shaped members than those described obviously may be employed in applying the invention to other constructions and in adapting the same to other uses. It should therefore be understood that the forms of the invention herein shown and described are intended to be illustrative of typical embodiments thereof and are not intended to limit the scope of the invention.

I claim:

1. Dogging means for closures or the like comprising a movable dogging member having a projecting shank, camming means mounted on said shank and positioned to engage an inclined surface on the closure on movement of said dogging member to a predetermined position, said camming means having a camming surface eccentric to said shank and cooperating means on said camming means and shank for adjusting said camming means in selected positions on said shank to vary the distance of that portion of the camming surface engaging the inclined surface on the closure from the projecting shank.

2. Dogging means for urging a door provided with an inclined bearing surface toward its frame, comprising a pivotally movable dogging member, camming means movable with said dogging member and engageable with said bearing surface on movement of said dogging member to a predetermined position, said camming means and dogging member having cooperating parts thereon selectively engageable to position said camming means with respect to said dogging member and said camming means having a plurality of camming surfaces for engaging said bearing surface to position said door selected distances from said dogging means when said dogging means is moved to said predetermined position.

3. Dogging means for urging a door toward a frame comprising means defining an arcuate inclined bearing surface, a dogging member pivotally mounted and movable over said bearing surface, camming means presenting a plurality of camming surfaces, and positioning means on said dogging member for supporting said camming means, said camming means and positioning means having cooperating elements for retaining said camming means on said dogging member in selected positions with selected camming surfaces engaging said bearing surface.

4. Dogging means for urging a door toward a frame comprising, a wedge-shaped member, a dogging member pivotally mounted and movable

over said wedge-shaped member, cam supporting means on said dogging member presenting a polygonal surface, camming means having a plurality of camming surfaces thereon and having a polygonal opening located eccentric to said camming surfaces and formed to receive the polygonal portion of said cam supporting means to position said camming means with a selected camming surface positioned to engage said wedge-shaped member on movement of said dogging member to a predetermined position.

5. Dogging means for urging the door toward a frame comprising, a wedge-shaped member, a dogging member pivotally mounted and movable over said wedge-shaped member, cam supporting means on said dogging member presenting a polygonal surface, camming means having a cylindrical camming surface and formed with a polygonal opening therethrough located eccentric to said cylindrical surface and formed to receive the polygonal portion of said cam supporting means to locate a selected portion of said cylindrical surface in position to engage said wedge-shaped member on movement of said dogging member to a predetermined position.

6. In combination with a water-tight door or hatch and a frame therefor having a gasket therebetween, a pivoted dogging member adapted to be moved into pressure applying position to urge said door toward said frame and to compress said gasket, operating means for said dogging member adapted to be actuated from either side of said door, a shaft extending in a water-tight sealing relation through said frame between said operating means and dogging member, camming means, a support for said camming means carried by said dogging member, said camming means presenting a camming surface eccentric to said support and movable into selected positions with respect to said dogging means to urge said door a selected distance toward said frame on predetermined operation of said operating means and when said camming means is in any selected position.

7. In combination with a water-tight door or hatch having a frame and a gasket between said door and frame, means adjustable to urge said door toward said frame to subject said gasket to a predetermined pressure to insure sealing of said door, comprising pivoted dogging members and complementary wedging means carried by said door and frame, a shaft mounted in water-tight sealing relation through said frame for actuating said dogging means, and having the opposite ends thereof projecting from opposite sides of said door to permit operation of said dogging member from either side of said door, a polygonal cam support on the dogging member, and a camming element having a complementary polygonal opening therein located eccentrically therein whereby said element may be secured to said support in any one of a plurality of positions with respect to said dogging means, said camming means having a camming surface thereon for engaging said wedging means to urge said door different selected distances toward said frame on predetermined movement of said operating means.

8. A bulkhead having a door frame, a door with an inclined surface adjacent an edge thereof and a gasket between said door and frame; in combination, an adjustable dogging member engageable with the inclined surface of said door for applying closing pressure, comprising a cam support, a cam member having an opening for mounting the cam on said support, said cam being formed with a plurality of camming surfaces eccentrically spaced from the center line of said opening, and positioning means for retaining said cam member on said support in any one of a plurality of positions for the engagement of a selected camming surface with the inclined surface of said door.

9. Dogging means adapted to urge a door or hatch in compression against a gasket for sealing an opening through a bulkhead or the like, comprising a dogging member adapted to be moved into pressure-applying engagement with said door and operable from either side of said door, a shaft extending in a water-tight sealing relation through said bulkhead and supporting said dogging member, and camming means carried by said dogging member and presenting camming surfaces movable into selected positions spaced at different distances from said dogging member, whereby the pressure applied in sealing said door may be varied without disturbing the water-tight sealing relation of said shaft.

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