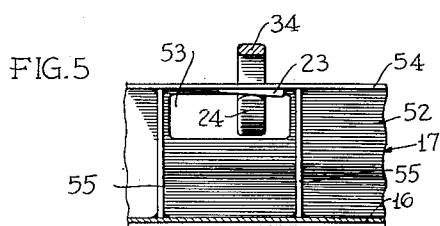
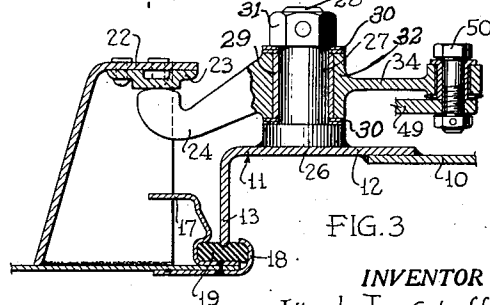
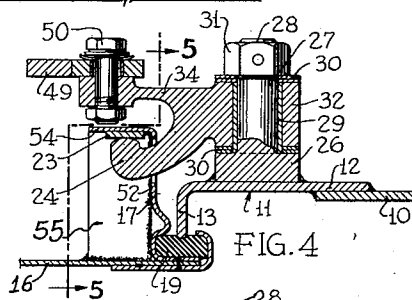
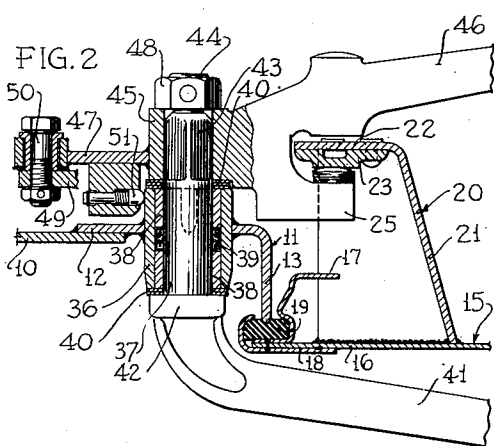
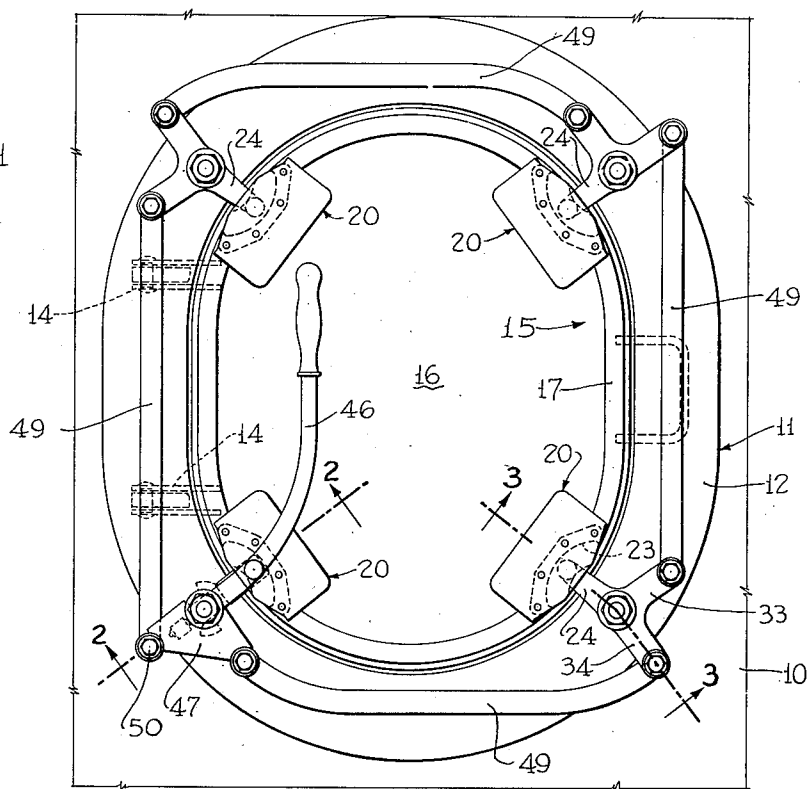


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BULKHEAD DOOR AND THE LIKE AND
FASTENING MEANS FOR SAME
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FIG. 1



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The invention relates to quick operating doors, hatches, scuttles or covers especially for closing fluid tightly the bulkheads, hatchways and the like of ships, airplanes and other structures.

More particularly, the invention relates in part to an improvement of the mechanism and the arrangement thereof forming the subject matter of the application Serial No. 621,322, of Ellis L. Jacob, filed October 9, 1945, for "Quick operating door."

The main object of the invention is a door, hatch or the like construction in which the entire or practically the entire operating and closing mechanism is carried by the stationary door frame and is under normal conditions removed from outside influence, such as weather, sand, dust and water.

The aforesaid and other objects and advantages are achieved mainly by combining the arrangement of the dogs for clamping the door or the like shut and the lever-and-rod system for operating the dogs on the frame of the door or the like opening, the door or the like carrying only the wedges to be engaged by the dogs, and the arrangement of the lever-and-rod system for operating the dogs in the interior of the structure to be closed with the arrangement of the dogs likewise on the inside where they engage undercut portions, provided with the wedges, of the door or the like.

The invention and its advantages will be more easily understood from the embodiments illustrated in the attached drawing and described in the following:

In the drawing:

Figure 1 is a small-scale inside elevation of a hatch in closed position, of the surrounding frame and adjoining portion of a bulkhead or the like;

Figures 2 and 3 are fragmentary sections along lines 2—2 and 3—3 respectively of Figure 1 on a larger scale;

Figure 4 is a fragmentary section similar to Figure 3 illustrating diagrammatically another embodiment; and

Figure 5 is a fragmentary sectional view taken along line 5—5 of Figure 4.

A bulkhead or the like 10 of a ship or other structure has its margin around an opening reinforced by an angle-section frame 11 having its one wide arm 12 in overlapping relation with the margin of and welded to the wall 10 while the other arm 13 projects toward the outside. Supported on the frame 11 by hinges 14 is the door or hatch 15 which comprises a main panel 16 and marginal rails 17 and 18, the latter holding a

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sealing strip 19. When the door is closed, the outer margin of frame arm 13 presses against the inner surface of the sealing strip 19 and provides for fluid- and gas-tight seal.

Secured to the inside and near the margin of the hatch are, in Figures 1 to 3, housing- or box-like structures 20 having walls 21 adjoining and extending transversely to panel 16 and having an end wall 22 extending parallel to and at a distance from panel 16. The open side of each structure 20 faces outwardly away from the center of the hatch.

The members constituting the hatch consist of sheet metal, for instance, ordinary carbon sheet steel or high-tensile material such as chromium nickel stainless steel, and are preferably connected with each other by electric spot or seam welding in the regions of overlap and by fusion welding respectively, as indicated at different places in the drawing.

Wedges 23 are riveted, in Figures 1 to 3, to the end walls 22 in the interior of the box structures 20. One of these box structures and of the wedges is arranged at each of the four corners of the hatch, but more will be distributed at about equal distances from each other and from the corners along the sides of larger doors. For closing the hatch, the wedges 23 are engaged by dogs 24, 25 rotatably supported by the door frame

11. Opposite the location of all but one of the wedges 23 a bracket 26 is welded to the inside of arm 12 of the door frame 11 and is provided with a bearing pin or shaft 27 screw threaded on its inner end 28. Rotatably supported by the members 26, 27, a bushing and washers 29, 30, and a nut 31 screwed on the portion 28, is a hub 32 which is connected with operating levers 33, 34 and a dog 24. In the closed position, illustrated in Figures 1 to 3, the dog extends through the open side of the adjacent box structure 20 and engages the wedge 23 therein.

Opposite the location of the one remaining wedge 23, a hollow bushing or tube 36 extends through a hole in arm 12 of the door frame 11 and is welded in the hole. A shaft 37 is journaled in the bushing or sleeve 36 by means of bushings 38, a fluid seal 39, and washers 40. The outer end of the shaft 37 is permanently connected or forms one piece with an operating handle 41 provided with a shoulder 42 which rests against the outer washers 40, while the inner end of shaft 37 has a square-section portion 43 and a screw threaded portion 44 over which fits the interiorly correspondingly shaped portion 45 integral with

dog 25, inner operating handle 46, and lever 47. The unit 45 to 47 is held in place by a nut 48.

The ends of the levers 33, 34 and 47 are journalled to and interconnected by four rods or links 49 and by bolts, washers and nuts 50. The arrangement is such that upon movement of one or both of the operating handles 41, 46 about the axis of their shaft 37 all dogs 24, 25 will be swung by means of the rods 49 and the levers 33, 34, 37 either into the locking position in which they engage the wedges 23 and point toward the center of the door, that is, into the position shown in the drawing, or into the open position. In the open position not only the dogs but the entire lever-and-rod system is outside the confines of the door opening, as is clearly apparent.

For the purpose of holding the entire locking mechanism in the open position, the lever 47 is provided with a spring biased plunger 51 engaging the outer surface of the bushing 36 which is provided with a deep recess (not shown) into which the plunger 51 is pressed when the lever 47 has reached the open position and from which it can be removed only by applying a considerable amount of force on one or both of the levers 41, 46 in the closing direction.

It is obvious that the door can be opened or closed, respectively, by swinging one of the levers 41 or 46 about an angle of approximately 90° and that in the open position no member of the operating mechanism or of the door projects into the door opening. It is further obvious that the door can be extremely light because it does not have to carry the operating mechanism.

For the embodiment diagrammatically illustrated in Figures 4 and 5 the same reference numerals are used for corresponding parts. In this embodiment, the door rail 17 has a wide web 52 provided adjacent the inner arm with a slot 53 at the location of each dog 24. The wedges 23 are secured to the underside of the rail arm 54. The slot 53 is of sufficient width and length to permit the free movement of the dog 24 into and out of engagement with the wedge 23. On both sides of the location of each wedge and the appertaining opening 53 the door structure is advantageously reinforced by webs 55 welded or otherwise secured to the web 52 and flange 22 of the door rail 17 and to the adjoining portion of the door panel 16.

While for the second embodiment only the construction at the location of one of the dogs is illustrated, it is obvious that it will be connected with other dogs, operating handles, etc., in similar manner as shown in Figures 1 to 3.

In both embodiments, the inner operating handle may be connected with the inner dog, but at this location the dog may also be located on the outside and engage a wedge secured to the outside of the door, as disclosed in the aforementioned application because penetration of the wall by the operating shaft connected to the outer handle is necessary anyhow.

Only the main elements of the door which have a bearing on the present invention are illustrated in detail in the drawing and described in the foregoing. It is obvious, however, that the door will be provided with such accessories as are customary or may be desired.

The invention is not restricted to the illustrated embodiments but is susceptible to modifications which will occur to those skilled in the art and are covered by the spirit and the language of the attached claims.

What is claimed is:

1. A closure structure comprising: a wall such as a bulkhead, said wall defining an opening; and a cover such as a hatch for the opening adapted for movement toward and into overlapping engagement with the one side of said wall; a plurality of movable dogs and common operating means for same arranged on and supported by the other side of said wall; said cover having a main panel and an angle-section marginal rail on the side of the cover engaging the wall, said rail having one arm extending transversely to and a second arm spaced from and generally parallel to said main panel, the surface of said second arm facing the main panel being arranged and constructed for engagement by said dogs to releasably hold the cover against said wall.

2. In a closure structure comprising a wall such as a bulkhead around an opening, a cover such as a hatch adapted for closing said opening by movement toward and into overlapping engagement with the one side of said wall, a plurality of movable dogs and of common operating means for same secured to and arranged on the other side of said wall, said cover having a main panel and an angle-section marginal rail connected with said panel on the side of said cover engaging the wall, said rail having one arm extending transversely to and a second arm spaced from and generally parallel to said main panel, said second arm extending from said first arm in the direction of the center of the cover, openings in said first arm opposite the location of said dogs permitting movement of the latter therethrough into and out of engagement with means provided on the surface of said second arm facing the main panel to releasably hold the cover against said wall.

3. In a closure structure comprising a wall such as a bulkhead around an opening, a cover such as a hatch for the opening adapted for movement into overlapping engagement with the one side of said wall, a plurality of movable dogs, and supports therefor and common operating means for said dogs arranged on the other side of said wall, said cover having a main panel, means for engagement with said dogs at the location of said dogs on said cover on the side engaging the wall, said last means having a web extending transversely and secured to said main panel and having an arm on said web spaced from and generally parallel to said main panel, said web having an opening for movement of the respective dog therethrough into engagement with the surface of said arm facing the main panel to releasably hold the cover against said wall.

4. In a closure structure comprising a wall around an opening and a cover for the latter marginally overlapping the one side of said wall, a plurality of movable dogs mounted on the other side of said wall and means on said cover on the side engaging the wall arranged and constructed for engagement by said dogs to releasably hold the cover against said wall.

5. A cover for a bulkhead opening provided on one side with peripheral means formed for engagement with margins of said opening, said cover having a main panel and an angle section rail paralleling the periphery of the cover and being spaced from said periphery by said engaging peripheral means, said rail having one arm extending transversely to and a second arm spaced from and generally parallel to said main panel, the surface of said second arm which faces

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the main panel being provided at a plurality of locations distributed over the periphery of the door with means for the engagement by fastening dogs carried by a bulkhead for releasably holding the cover with its peripheral means against the margins of said bulkhead opening.

6. A cover for a bulkhead opening provided on one side with peripheral means formed for engagement with margins of said opening, said cover having a main panel and an angle section rail paralleling the periphery of the cover and being spaced from said periphery by said engaging peripheral means, said rail having one arm extending transversely to and a second arm spaced from and generally parallel to said main panel, said second arm extending from said first arm toward the center of the cover, the surface of said second arm which faces the main panel being provided at a plurality of locations distributed over the periphery of the door with means for the engagement by fastening dogs carried by a bulkhead for releasably holding the cover with its peripheral means against the margins of said bulkhead opening, and said first arm being provided at the same locations with openings permitting movement of said dogs there-through.

7. A cover for a bulkhead opening provided on

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one side with peripheral means formed for engagement with the margins of such opening, said cover having a main panel and a plurality of second means at locations near and located at spaced points along the periphery of the cover, said second means having a web extending transversely and secured to said main panel and having an arm on said web spaced from and generally parallel to said main panel, said web providing for an opening permitting therethrough the movement of fastening dogs carried by a bulkhead and the dogs' engagement with the surface of said second arm facing the main panel to releasably hold said cover with its peripheral means against the margins of the bulkhead opening.

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