

Jan. 10, 1950

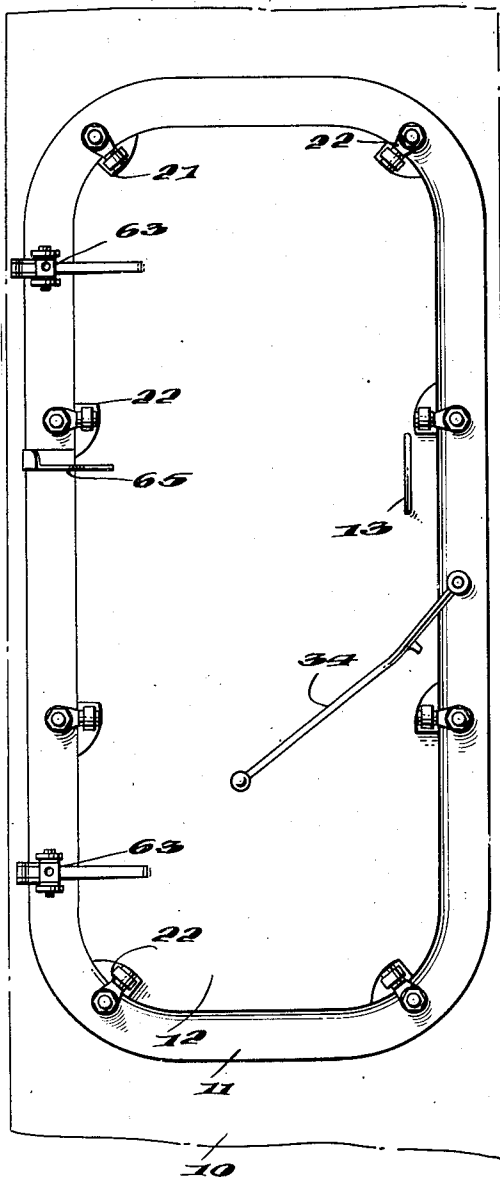
F. M. LAMBERT  
DOOR LATCH STRUCTURE

2,493,882

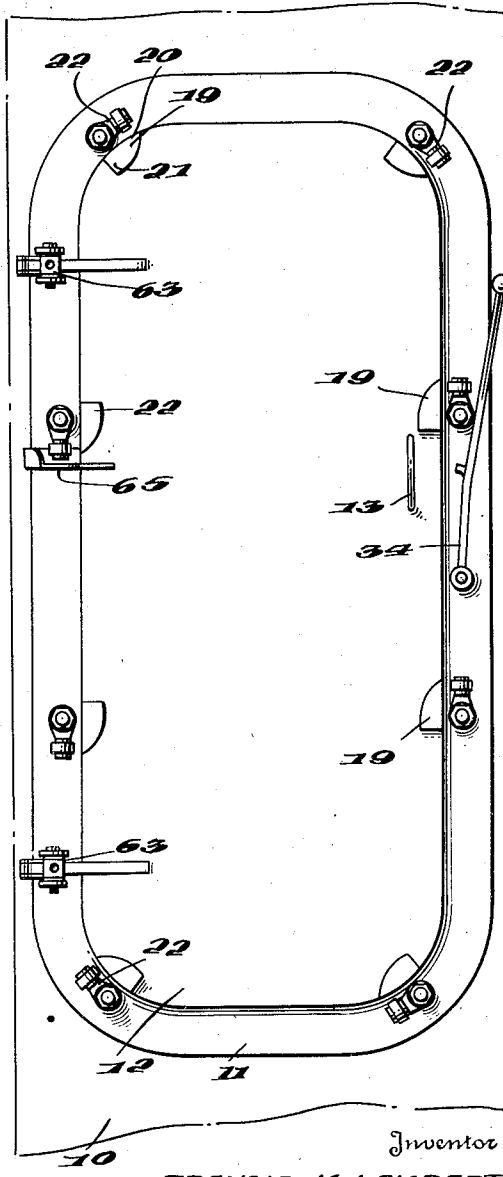
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*Fig. 1.*



*Fig. 2.*



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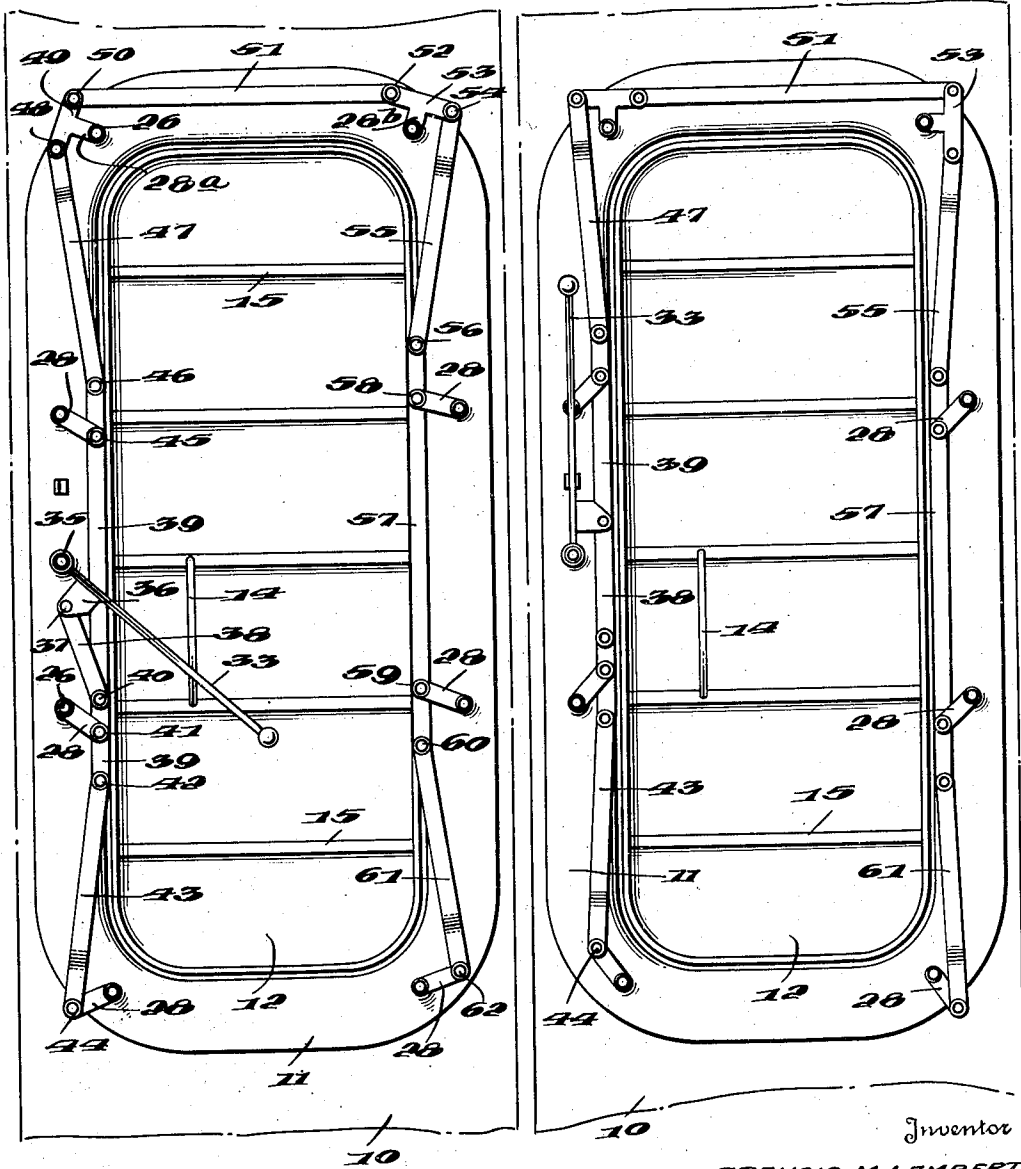
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*Fig. 3.*

*Fig. 4.*



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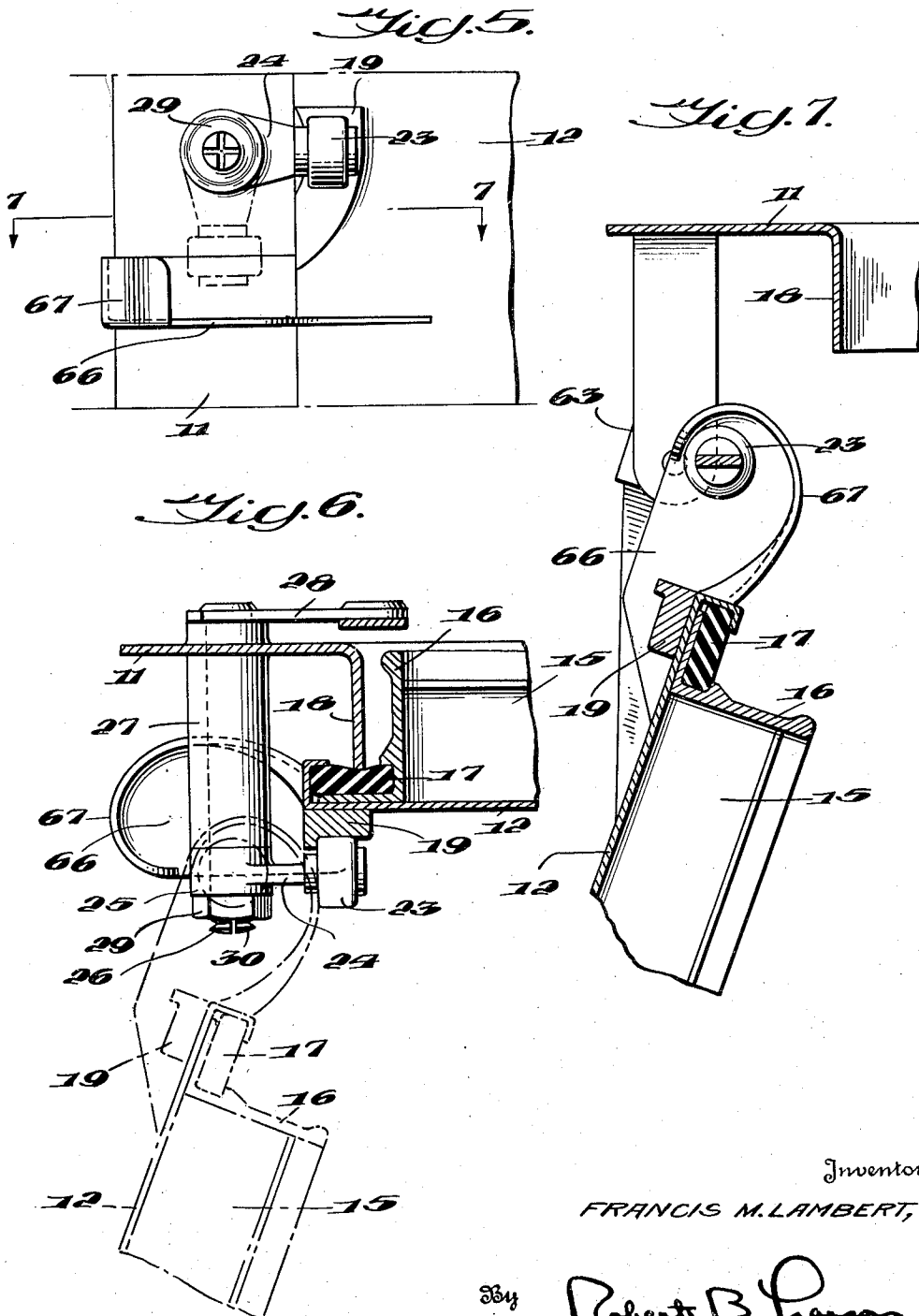
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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,493,882

## DOOR LATCH STRUCTURE

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Application December 4, 1946, Serial No. 713,974  
In Great Britain December 5, 1945

4 Claims. (Cl. 292—12)

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This invention relates to door structures and more particularly to dogging means for such structures. The arrangement of parts to be described is particularly applicable to ship-board use but, of course, may be applied to other types of doors.

In door dogging arrangements as disclosed by the prior art, the dogs and the inter-connecting linkage by which the dogs are operated from a single point on the door are generally mounted on the door itself. This type of arrangement has the disadvantage that the dogging mechanism which extends a substantial distance on one or both sides of the door surface lies, to some extent, in the passageway in which the door is positioned and extends past the inner edge of the door frame so as to obstruct somewhat movement through the passageway. Another disadvantage of the door-carried mechanisms is that a person desiring to close the door from the inside will have to reach through the opening in the door frame to grasp the operating handle or other element for pulling the door shut.

Another common disadvantage of prior art door dogging structures is that there is no provision for maintaining the dogs in their undogged positions when the door is open so that many times it is necessary when it is desired to close the door, to operate the dog-controlling mechanism to swing the dogs to their undogged position clear of the doorway in order that the door may be closed. On ship-board, where the immediate closing of a water-tight door may mean the difference between life and death, any small advantage which can be gained is, of course, of great importance.

With a view toward overcoming the above disadvantages of the prior art and providing in addition other advantages I have provided the structure to be described hereinbelow.

It is an object of the invention to provide a dogging construction for doors in which all of the movable parts of the dog operating mechanism are mounted on the door frame and are operable from a single point. The construction provided has the further advantage that when the mechanism is in the undogged position all of the parts thereof are clear of the doorway and hence can in no way obstruct passage there-through.

It is another object of the invention to provide a dogging construction which dogs the door at a plurality of spaced positions about the periphery of the door, and which is operable from either side of the door.

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Still another object of the invention is to provide a simple arrangement for retaining the dogs in their undogged positions clear of the doorway as long as the door is open.

These and other objects of the invention will be apparent from the following specification and the accompanying drawings, in which:

Figure 1 is a front elevation taken from the outside of a door and frame in a preferred embodiment of the invention with the dogs in their dogged positions;

Figure 2 is a view similar to Figure 1 but with the dogs in their undogged positions;

Figure 3 is a view similar to Figure 1 but taken from the inside of the door;

Figure 4 is a view similar to Figure 2 but taken from the inside of the door;

Figure 5 is a detail front elevational view of one of the dogs shown in Figures 1 and 2 and showing the manner of cooperation of the dog with the means for retaining the dogs in their undogged positions when the door is open, the door being shut in the figure.

Figure 6 is a detail cross sectional view taken through a portion of the door and the door frame looking down on the structure shown in Figure 5, the door being shown in open position in broken lines, and;

Figure 7 is a cross sectional view taken on line 7—7 of Figure 5.

In the preferred embodiment of the invention shown in the drawings the novel structure is shown as reduced to practice for use with ships' doors of the water-tight type.

In the drawings there is shown a bulkhead 10 in which is mounted by welding or other appropriate means a door frame 11 having a central doorway or opening which is adapted to be closed by a door 12.

Door 12 has an outer hand grip 13 and an inner hand grip 14, and on its inner side has a plurality of horizontally extending bracing members 15 which terminate at their ends at a flange 16 which extends a short distance from the inner surface of the door in a direction perpendicular to the plane of the door about the entire periphery of the door. The main flat portion of door 12 when viewed from the front is slightly larger than the opening in the door frame and a gasket 17 is provided about the entire periphery of the door on its inner side for cooperation with an outwardly extending portion 18 of the door frame so as to provide a water-tight seal when the door is shut tightly.

At a plurality of spaced points about the pe-

riphery of the door, the door is provided with cams 19 which have low portions 20 adjacent the edge of the door and which increase in height to raised portions 21. A plurality of roller-type dogs 22 are provided on the door frame for co-operation with cams 19 so that as the dogs move to the higher portions of cams 19, the door will be urged more tightly shut, and the tighter will be the seal about the outer edge of the door.

Each dog 22 comprises a roller 23 (Figure 6) rotatably mounted on an arm 24 extending radially from a hub 25. Hub 25 is keyed to a spindle 26 journaled in a suitable watertight manner within a cylinder 27 extending on both sides of the door frame 11 and welded thereto. An arm 28 of the dog operating linkage is welded to the inner end of spindle 26 and abuts against the inner end of cylinder 27. Hub 25 abuts against the outer end of cylinder 27 and is retained thereon by a nut 29 which is positioned on a threaded outer end portion 30 of the spindle 26. Suitable means are provided for assuring that nut 29 does not become unscrewed, as for instance, the extreme end portion 30 of spindle 26 may be provided with one or more diametrically disposed slots.

By rotary movement of arm 28 about the axis of spindle 26, it will be apparent that spindle 26 is rotated and arm 24 carrying dog roller 23 will rotate therewith about the axis of spindle 26. The type of movement of which arm 24 partakes is shown in Figure 5 and will also be apparent from a study of Figures 1 and 2.

From Figures 1 and 2 it will be apparent that eight dogs are used with each door in the preferred embodiment described herein. The door is rectangular in shape with rounded corners, and four of the dogs are located on the door frame adjacent each rounded corner. Other dogs are located on the left and right sides, as viewed in Figures 1 and 2, of the door frame approximately one-third of the way up from the bottom of the door and approximately one-third of the way down from the top of the door.

Referring now to Figures 3 and 4 it will be seen that the dogs are arranged to be operated by either of two operating handles 33 and 34 located on the inside and outside of the door, respectively. Handles 33 and 34 are attached to the same spindle 35 journaled in the door frame in a suitable water-tight manner so that rotation of either of the handles 33, 34 will operate the linkage mechanism attached to handle 33.

Handle 33 is provided near its point of attachment to spindle 35 with a short arm 36 to which is pivoted at 37 a short downwardly extending link bar 38. Link 38 is pivoted at its lower end to a bar 39 which is substantially longer than the distance between the two centrally positioned dogs carried by the vertically extending portions of the door frame. The point of pivotal attachment of the lower end of link 38 to bar 39 is at 40, a short distance above the lower end of bar 39. Operating arm 28 of the dog located immediately below spindle 35 is attached at one of its ends to its spindle 26 and at its other end is pivoted to bar 39 at a point 41 located between pivot point 40 and the lower end of bar 39. At its extreme lower end, bar 39 is pivoted at 42 to a somewhat shorter link bar 43 which is pivoted at its lower end 44 to the operating arm 28 of the lower left-hand dog as viewed from the inside of the door.

The arm 28 of the dog immediately above spindle 35 is pivotally attached at its free end to the

bar 39 at a point 45 spaced a short distance below the upper end of bar 39. A pivot 46 at the extreme upper end of bar 39 provides a point of attachment to the lower end of a link 47 which extends upwardly for pivotal attachment at 48 to one end of the cross arm 49 of the T-shaped arm 28a which is fixed to the spindle 26 of the upper left hand corner dog as viewed in Figure 3. The other end of cross arm 49 of member 28a is pivotally connected at 50 to a horizontal linkage member 51 which extends across the upper portion of the door frame to the right hand side of the frame where it is pivoted at 52 to one end of the cross arm 53 of a T-shaped member 28b which operates the upper right hand corner dog as viewed in Figure 3.

The other end of cross arm 53 of T-shaped member 28b is connected at 54 to the upper end of a link 55 which is similar to link 47. Link 55 is pivoted at 56 to the upper end of a central vertical link member 57 which operates the arm 28 of the upper central right hand dog by pivotal attachment at 58 to the free end of the last-mentioned arm 28 at a point near the upper end of link 57. A similarly positioned pivotal connection 59 near the lower end of link 57 operates the arm 28 of the lower central right-hand dog. Finally, the link 57 is pivoted at its lower end at 60 to a linkage member 61 similar to member 43, the link 61 being pivoted at its lower end at 62 to the arm 28 which operates the lower right hand corner dog.

It will be noted that certain of the arms 28, 28a, 28b point inwardly toward the opening in the door frame while others point outwardly, the arrangement shown being highly efficient in accomplishing the desired results.

As shown in Figure 4, when operating handle 33 is in the vertical position link 38 and link 39 are parallel and are positioned at the extreme of their upward movement so that the afore-described linkage mechanism moves the dogs to the positions shown in Figure 2 in which all of the dogs are swung clear of the door and permit swinging of the door on hinges 63 to an open position. While many types of hinges may be used with the invention described herein, the hinges 63 shown in the drawings are similar to the one described in and claimed in my co-pending application, Serial No. 614,841, filed September 7, 1945, now Patent No. 2,482,983 dated September 27, 1949, and such hinges are particularly convenient for use with this type of door construction.

It will be noted by referring to Figure 4 that when the dogs are in their undogged positions, the entire linkage arrangement is positioned outside of the confines of the doorway opening through the door frame 11 so that there is no obstruction of the passageway.

When it is desired to dog the door shut, either operating handle 33 or 34 is moved from the vertical position in a direction toward the opposite side of the door frame causing link 38 to move link 39 downwardly and thereby to move the parts of the linkage on the handle side of the door frame downwardly and the parts on the other side of the door frame upwardly so as to rotate the dogs to dogging positions as shown in Figure 1. In their dogged positions, the rollers 23 of the dogs are in contact with the surfaces of cams 19 and continued downward movement of operating handle 33 or 34 causes the dog rollers 23 to move to higher portions of the cams 19, causing the door to be urged more tightly against the edge of portion 18 of the frame 11.

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Because of the fact that it would be possible, with the door open, to move the dogs to their dogged positions thus causing operating handles 33 and 34 and the dogs 22 to thus block the passageway through the door frame, I have provided means for preventing such movement of the dog and link mechanism as long as the door is open.

This arrangement is represented generally by the numeral 65 and as shown in detail in Figures 5 through 7 comprises a piece of sheet metal 66 welded to the front surface of the door so as to be disposed horizontally and to extend well beyond the edge of the door to which the hinges 63 are attached. Sheet metal member 66 is positioned close to one of the dogs mounted on the hinge carrying side of the door but a sufficient distance below the dog to permit the dog to swing to its undogged position without the end of the roller carrying arm 24 contacting the piece 66.

Member 66 is provided with an upwardly extending flange or wall 67 which extends about the edge of sheet metal member 66 from a point near the forward edge of member 66 remote from the edge of the door around the rear edge of member 66 (the right edge as viewed in Figure 7) to a point where flange 67 contacts the edge of the door. Flange 67 extends upwardly a sufficient distance to extend into the arc of movement of the cooperating dog roller 23 when the door is in its open position as shown in Figure 7 and as shown in Figure 6 in dotted lines.

When the door is in its closed position the unflanged portion of member 66 lies below the arc of movement of the dog so that the dog can be swung from its downwardly extending undogged position to the dogged position as shown in solid lines in Figure 5. The dog can also be swung back to its undogged position without any interference from member 66.

However, when the door is swung from its closed position, flange 67 blocks movement of the dog to its dogged position, and due to the fact that the single dog which cooperates with member 65 cannot move to its dogged position, the remaining dogs are also prevented from so moving because of their linkage connection with the particular dog which cooperates with member 65.

In this way it is assured that as long as door 12 is in an open position, the operating handles 33 and 34 cannot be moved into a passage-obstructing position. As pointed out previously herein, the delay which would be entailed in moving the obstructing parts out of the open passageway in case of emergency might spell the difference between life and death on ship-board so that the retention of the dogs in the undogged position when the door is not closed is highly important.

I wish it to be understood that I have shown and described only a preferred embodiment of the invention in accordance with the patent statutes and I fully realize that the invention is susceptible of numerous modifications without departing from the inventive concept. The invention is not to be limited to the preferred embodiment but is intended to cover all modifications of the invention falling within the scope of the appended claims.

I claim:

1. In a door construction having a door hinged to a door frame, the combination of a plurality of dogs mounted on said frame for movement

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between dogging positions in which they retain the door in closed position and undogging positions in which they lie completely clear of the doorway and door, a linkage mechanism interconnecting all of said dogs for operation from a single point, and detent means cooperating with one of said dogs to retain said dog and thereby all of said dogs in their undogged positions clear of said door and doorway when said door is in other than its closed position, said last named means including a member carried by the hinged edge of the door in proximity to one of said dogs and having a wall extending along a portion thereof, said member being so constructed that said wall lies out of the path of movement of said last-mentioned dog when said door is shut thereby permitting free movement of the dog and thereby all of the dogs to and from their dogged positions, and said wall obstructs movement of said dog and thereby all of the dogs from their undogged positions when said door is in other than its closed position.

2. In a door construction in which a door is hinged for swinging movement to a door frame, the combination of a plurality of dogs mounted in spaced positions on said door frame for movement between dogged and undogged positions, a linkage system interconnecting said dogs to cause all of the dogs to move to and from said positions together, and a retainer member attached to and projecting beyond the hinged edge of the door for swinging movement therewith, said retainer comprising a flat element disposed in a plane substantially perpendicular to the pivot axis of the door, and a wall attached to said flat element and extending along a portion thereof and out of the plane of said element, said wall extending partly about one of the dogs when the dog is in undogged position but out of path of movement of said dog when said door is closed permitting movement of said dog to and from said dogged and undogged positions, said flat element and wall being moved upon opening of said door to a position in which said wall obstructs movement of said dog and thereby all of said dogs to their dogged positions until said door is again closed.

3. In a door construction in which a door is hinged to a door frame for swinging movement, the combination of at least one dog mounted on the door frame and pivotable between a dogged position and an undogged position, an operating member for moving said dog between said positions, linkage means operably connecting said member and said dog, and detent means carried by the door and cooperating with said dog, said detent means having an inoperative position in which it permits free movement of said dog between said dogged and undogged positions and an operative position in which it retains said dog against movement from its undogged position, said detent means being in said inoperative position when said door is closed, and being in said operative position when said door is in other than its closed position.

4. A device for use with a closure arrangement including frame means, closure means cooperating with said frame means and pivotably mounted along one edge for swinging movement between open and closed positions with respect to said frame means, and at least one dog member pivotably mounted on said frame means in proximity to the pivoted edge of the closure means, said dog having a dogging position in

which it overlaps the closure means to hold said means in closed position, and a non-dogging position in which it lies clear of the closure means; comprising a member mountable on the closure means in proximity to said dog, said member having a wall extending along a portion thereof, said member being mountable so that said wall lies out of the path of movement of said dog when said closure means is in closed position and lies in the path of movement of the dog when the closure means is in other than its closed position, thereby preventing movement of the dog from its non-dogging position except when the closure is in closed position.

FRANCIS M. LAMBERT.

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