Oct. 7, 1958 E. M. GREER 2,855,038

HATCH COVER ASSEMBLY

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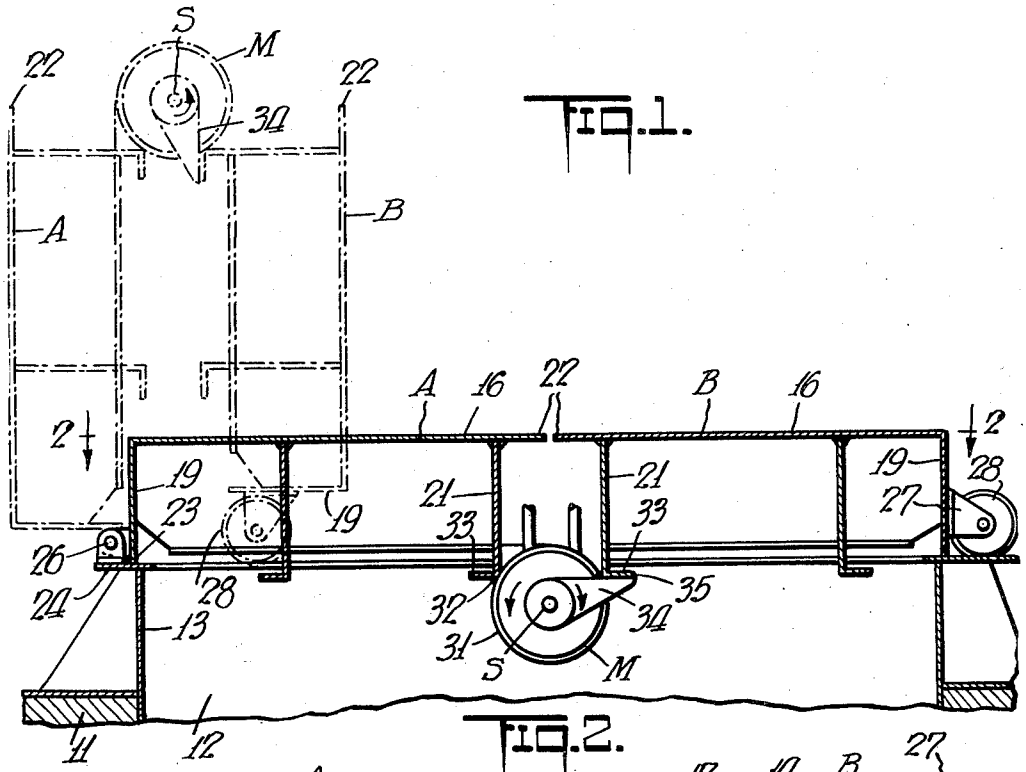
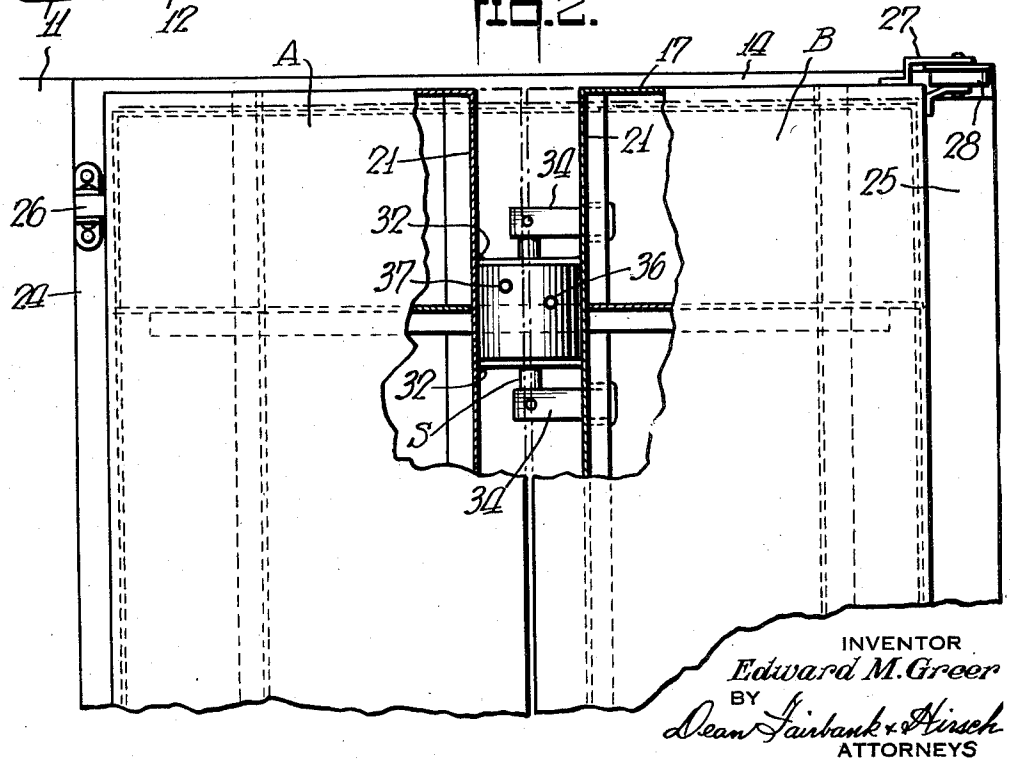


FIG. 1.

FIG. 2.



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FIG. 3.

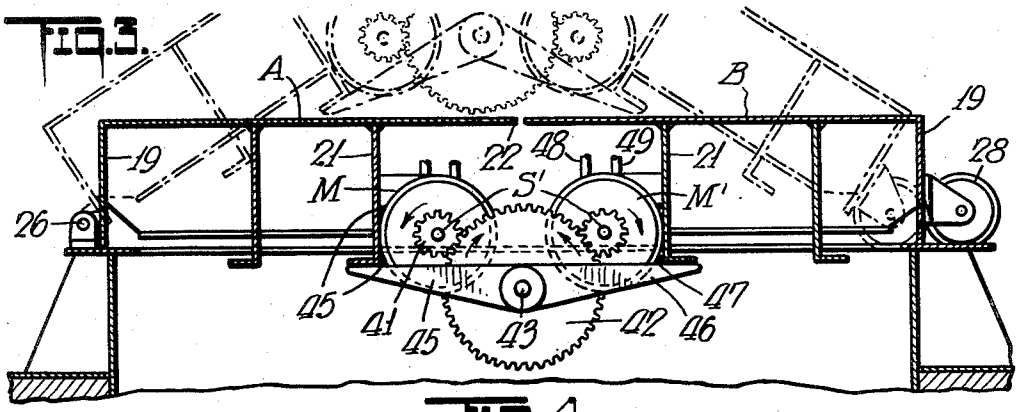


FIG. 4.

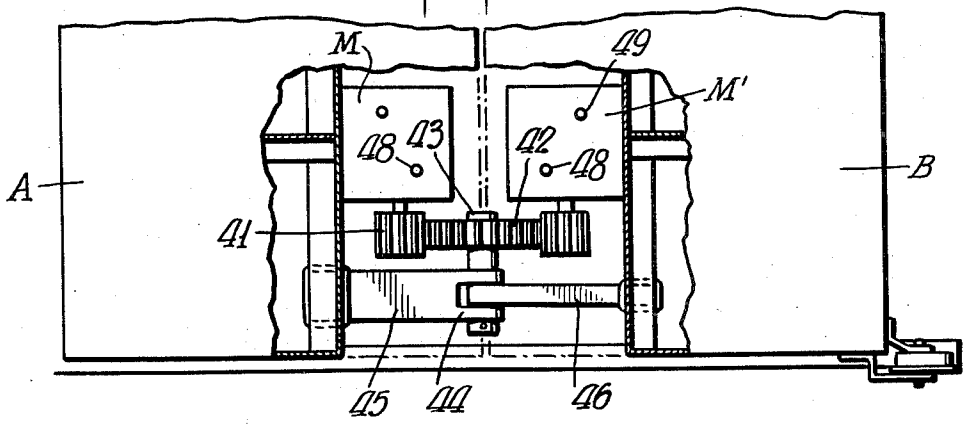
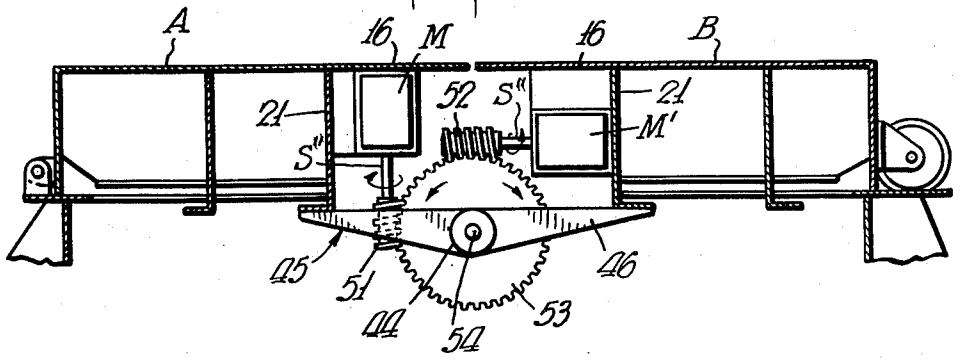


FIG. 5.



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FIG. 6.

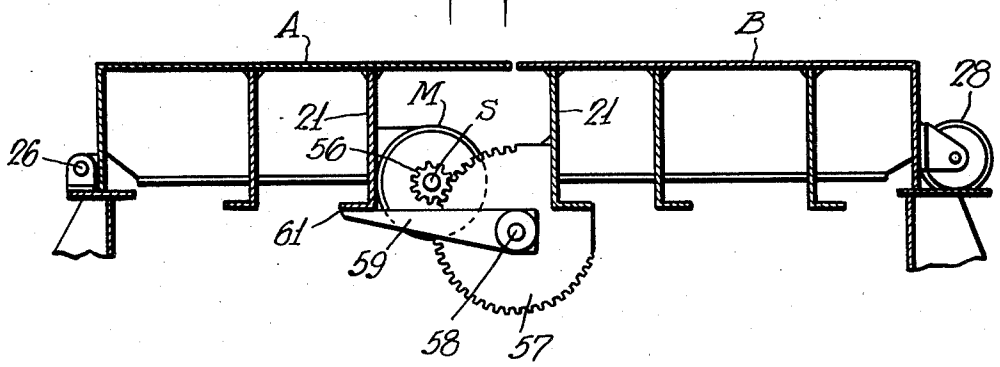
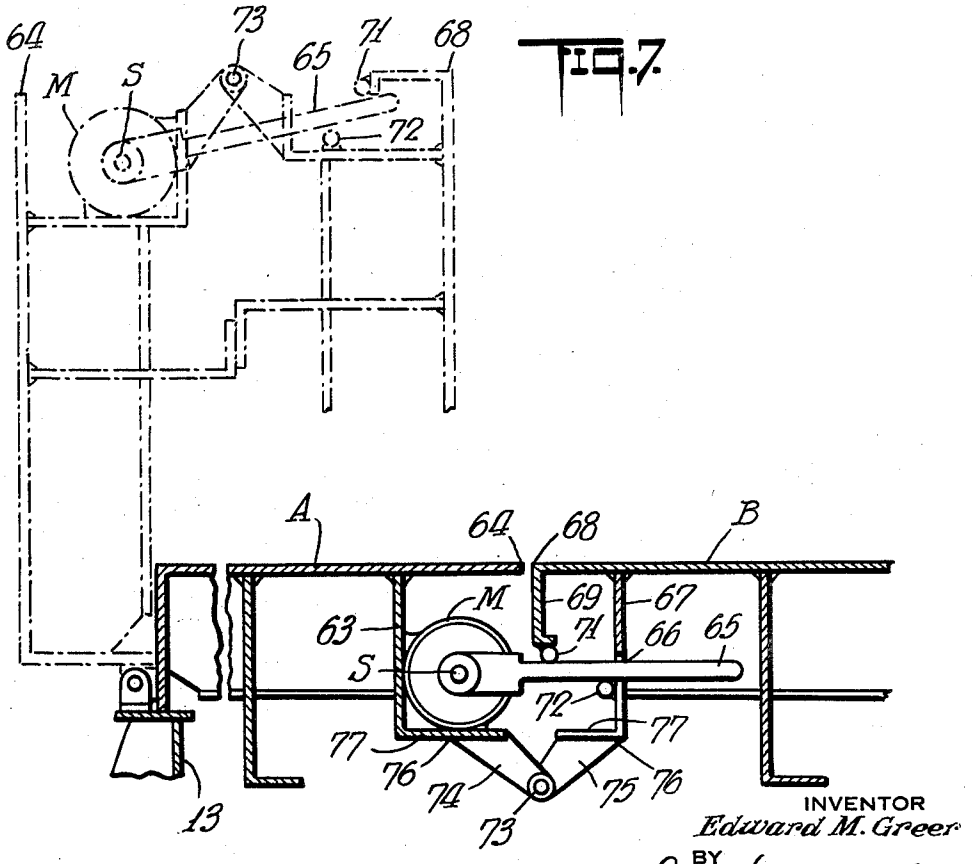


FIG. 7.



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2,855,038

HATCH COVER ASSEMBLY

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Application May 16, 1955, Serial No. 508,563

2 Claims. (Cl. 160—188)

This invention relates to the art of hatch covers and more particularly to the means for actuating such covers.

It is among the objects of the invention to provide actuating means for hatch covers that is dependable in operation and has few parts that may readily be mounted in a relatively compact space, that does not require conversion of longitudinal motion to rotary motion to pivot the hatch covers from closed to open position and has a minimum number of motion transmittal points that are subject to wear, thereby requiring a minimum of maintenance.

According to the invention, these objects are accomplished by the arrangement and combination of elements hereinafter described and particularly recited in the claims.

In the accompanying drawings in which are shown one or more of various possible embodiments of the several features of the invention,

Fig. 1 is a transverse sectional view of one embodiment of the hatch cover,

Fig. 2 is a fragmentary top plan view with parts broken away taken along the line 2—2 of Fig. 1,

Fig. 3 is a view similar to Fig. 1 of another embodiment of the hatch cover,

Fig. 4 is a fragmentary top plan view with parts broken away of the hatch cover shown in Fig. 3,

Figs. 5, 6 and 7 are views similar to Fig. 1 of other embodiments of the hatch cover.

Referring now to Figs. 1 and 2 of the drawings, the reference numeral **11** refers to the deck of a ship in which there is a substantially rectangular hatchway **12**. Rising from the deck **11** around the hatchway **12** is a substantially rectangular coaming **13** which serves to support the hatch covers in the manner to be described.

Extending longitudinally of the coaming **13** on each side thereof are elongated flanges **14** which also define tracks. Although the flanges **14** may be mounted in any suitable manner, in the illustrative embodiment shown they are affixed to the side walls of the coaming **13** and extend laterally outward therefrom aligned with the upper edge of the coaming.

As shown in Figs. 1 and 2, the hatchway is designed to be closed by a hatch cover which comprises a pair of substantially rectangular panels A and B. Although the panels may be made in any suitable manner, as illustratively shown, each has a top wall **16**, end walls **17** and side walls **19** and **21** extending transversely across the coaming **13**, the walls **21** being positioned inwardly of the associated longitudinal edges **22** of panels A and B.

The panels A and B are of sufficient length as to extend transversely across the hatchway with the lower edges of their end walls **17** resting on the flanges **14** on opposed sides of the coaming. The width of the panels is such that in the closed position shown, the lower edges **23** of their side walls **19** will rest on lateral flanges **24**, **25** at each end of the hatchway and also aligned with upper edge of the coaming.

The side wall **19** of panel A is desirably connected near its lower edge **23** by hinges **26** to flange **24**. Affixed to each of the end walls **17** of panel B adjacent its side wall **19** is an arm **27** which extends beyond said wall **19** and mounts a roller **28** at its free end which rides on the associated flange **14**.

To move the hatch covers from the closed position shown in Fig. 1 to the open position shown in dot and dash lines, a hydraulic motor M is provided which may be of the type shown in Patent No. 1,974,775, dated September 25, 1934. The motor M has a casing **31** which is affixed as by welding at **32** to the lower edge **33** of wall **21** of panel A so that the shaft S of the motor, which desirably protrudes beyond both ends of the casing, extends parallel to said wall **21**. Affixed at one end to each of the protruding ends of shaft S is an arm **34**, the free end of which is affixed as by welding as at **35** to the lowed edge **33** of wall **21** of panel B.

In the operation of the unit shown in Figs. 1 and 2, fluid under pressure is applied to port **36**, for example, of motor M so that torque is applied by shaft S to attempt to rotate arms **34** in a clockwise direction. As the shaft S is connected by arms **34** to panel B, by reason of the weight of such panel, torque will also be applied to the casing **31** to attempt to rotate the latter in a counterclockwise direction. As the panels are restrained from downward movement by reason of the hinge connections **26** to flange **24** and the rollers **28** which ride on flanges **14**, such combined torque will create an upward component of force which will pivot the panel A in a counterclockwise direction about its hinge **26**, and the panel B in a clockwise direction about its rollers **28** which will ride along the tracks **14** to the open position shown in broken lines in Fig. 1.

To close the hatch covers, fluid is applied to the port **37** so that torque is applied to shaft S to rotate the latter in a counterclockwise direction. This will cause the panel B to pivot in a counterclockwise direction with respect to the axis of motor M, and as the weight of panel B will retain rollers **28** thereof on the associated flanges **14**, the panels A and B will move to the closed position shown.

In the embodiment shown in Figs. 3 and 4, the side walls **21** of panels A and B are positioned further inwardly of the edges **22** than in the embodiment shown in Figs. 1 and 2. Hydraulic motors M and M′ are affixed as by welding to the outer surface of each of the walls **21**, each of the shafts S′ of said motors mounting a pinion **41**. The pinions **41** mesh with a gear **42** rotatably mounted at the end of a stud shaft **43** which extends through the arms of a yoke **44** at the end of an arm **45** affixed as by welding at its other end as at **45′** to the lower end of wall **21** of panel A. A second arm **46** is affixed at one end as by welding as at **47** to the lower end of wall **21** of panel B, the free end of arm **46** being positioned between the arms of yoke **44** and having an opening through which the stud shaft **43** extends.

In the operation of the embodiment shown in Figs. 3 and 4, fluid under pressure is applied to the ports **48**, for example, of each of the motors M and M′ to effect rotation of their shafts S′ and the pinions **41** thereon in a counterclockwise and clockwise direction respectively. As the result of the rotation of the pinions in opposed directions, an upward component of force will be applied to the gear **42** thereby causing the panels A and B to pivot in a counterclockwise and clockwise direction respectively about their hinge **26** and rollers **28**.

To close the panels it is merely necessary to apply fluid under pressure to the ports **49** of the motors M and M′ to effect rotation of their shafts S′ and pinions thereon in the reverse direction. As a result, a downward component of force will be exerted against the gear **42**

to cause the panels to move to the closed position shown in full lines.

In the embodiment shown in Fig. 5, the panels are substantially identical to those shown in Fig. 3. A hydraulic motor M is affixed to the wall **21** of panel A so that its shaft S'' extends at right angles to the top wall thereof and a second hydraulic motor M' is affixed to the wall **21** of panel B so that its shaft S'' extends parallel to the top wall **16** thereof.

Affixed to the ends of each of the shafts S'' are worms **51** and **52** respectively which mesh with a worm gear **53** mounted on a stud shaft **54** which extends through the arms of a yoke **44** at one end of an arm **45** identical to the arm **45** of Figs. 3 and 4 and affixed as by welding at its other end to the lower end of wall **21** of panel A. A second arm **46** identical to arm **46** of Fig. 4 is affixed at one end as by welding to the lower end of wall **21** of panel B, the free end of arm **46** being positioned between the arms of yoke **44** and having an opening through which the stud shaft **54** extends.

The operation of the unit shown in Fig. 5 is substantially identical to the operation of the device shown in Figs. 3 and 4, that is, fluid under pressure is applied to the motors M and M' to rotate the shafts S'' thereof in such direction that the worms **51** and **52** will tend to drive the worm gear **53** in opposite directions thereby causing an upward component of force that will effect movement of the panels to open position.

In the embodiment shown in Fig. 6, the hydraulic motor M is affixed to the wall **21** of panel A and the shaft S of said motor carries a pinion **56** which meshes with a gear segment **57** affixed to the wall **21** of panel B and extending at right angles therefrom. The gear segment **57** has a stud shaft **58** which rotatably mounts one end of an arm **59**, the other end of said arm being affixed as by welding as at **61** to the lower edge of wall **21** of panel A.

In the operation of the unit shown in Fig. 6, when the pinion is rotated in a counterclockwise direction it will tend to urge the gear segment **57** in a clockwise direction. However, as such gear segment is affixed to panel B, an upward component of force will be created which will rotate the panel A in a counterclockwise direction about its hinge **26** and the panel B in a clockwise direction about its rollers **28** thereby effecting opening of said cover.

In the embodiment shown in Fig. 7, a hydraulic motor M is affixed to a wall **63** adjacent the edge **64** of panel A. The motor M has a shaft S to which is affixed an elongated arm **65** which extends through an opening **66** in wall **67** of panel B. The edge **68** of panel B has a depending flange **69** which carries a rigid abutment member **71** at its lower edge and the wall **67** also mounts an abutment member **72**, the rod **65** extending between said abutment members.

The panels A and B are hinged together as at **73** at the adjacent ends of a pair of complementary arms **74** and **75** affixed at their other end as at **76** to lateral flanges **77** carried by walls **63**, **67**.

In the operation of the unit shown in Fig. 7, when fluid under pressure is applied to the hydraulic motor M to rotate the shaft S thereof in a clockwise direction, as the panel B is restrained from movement by reason of the fact that it rests on the coaming **13**, the resultant torque will provide an upward component of force which will pivot panels A and B in a counterclockwise and clockwise direction respectively to lift the panels toward open position. As this occurs, the rod **65** will slide from the opening **66** in wall **69** until it reaches the position shown in dot and dash lines in Fig. 7.

To close the panel shown in Fig. 7, it is merely necessary to rotate the shaft S of motor M in the opposite direction, i. e., in a counterclockwise direction. This will cause the panel B to pivot in a counterclockwise direction about its hinge **73** and by reason of the weight of such panel, the rollers thereof (not shown) will be retained on the associated track and the two panels will move to closed position.

With the constructions above described, there is no need for the complicated space consuming linkage for converting longitudinal motion from a hydraulic jack, for example, into rotary motion necessary for pivoting the hatch covers from closed position and by reason of the elimination of such linkage the number of motion transmittal points is reduced to a minimum and the equipment may be operated for long periods with a minimum of maintenance.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. Equipment for controlling access to a hatchway, comprising a pair of panels adapted to lie in substantially a horizontal plane over the hatchway when in closed position with the adjacent inner edges of said panels in juxtaposition, the outer edge of at least one of said panels being free to move in a horizontal plane, a hydraulic motor affixed to one of said panels adjacent its inner edge, said motor having a shaft extending parallel to said inner edge, said panels being pivotally connected adjacent their inner edges, an elongated driving member affixed at one end to said shaft extending at right angles therefrom and affixed at its other end to said other panel adjacent its inner edge, the shaft of said motor defining the pivotal connection between said panels, whereby upon rotation of the shaft of said hydraulic motor an upward component of force will be provided with respect to said pivotal connection to move the panels toward each other to open position with respect to said hatchway.

2. The combination set forth in claim 1 in which a track is provided on each side of said hatchway and the panel whose outer edge is free to move in a horizontal plane mounts a roller at each of its ends adjacent said outer edge, said rollers riding on an associated track and the outer edge of the other of said panels is hingedly mounted with respect to the hatchway.

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