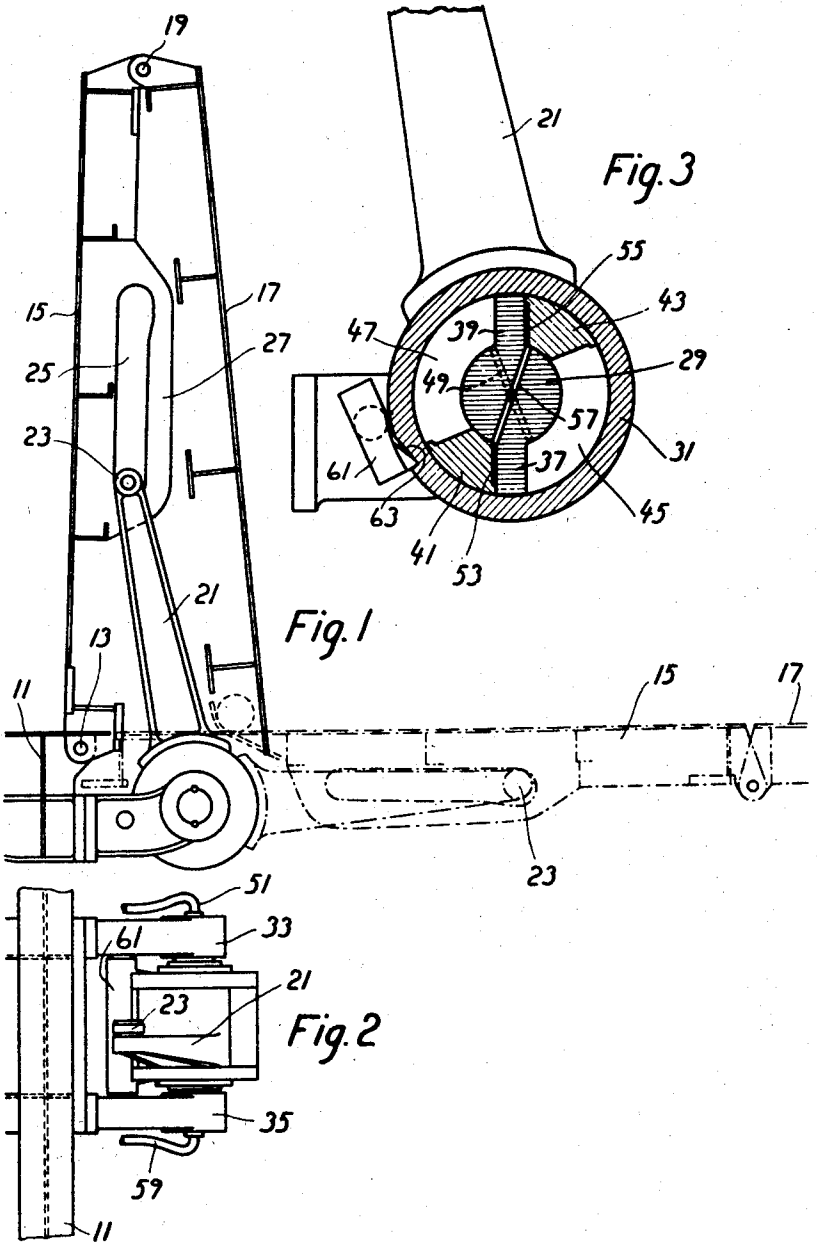
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HATCH OPERATING DEVICE

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HATCH OPERATING DEVICE

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This invention relates to an improved hatch operating device for raising and lowering the hatch of a cargo hold in a vessel of the kind where the hatch is pivotally attached to one side of a frame which surrounds the hatchway. The objects of the invention are to provide an operating device which causes comparatively small stresses only on the hatch itself and its hinges or other pivoting means, and which requires a small space only, and which does not obstruct, nor is subjected to risks of being damaged by the loading and unloading of the ship, and which is simple and reliable in operation. These objects are attained according to the invention by the operating device comprising a lever that is positioned below the hatch, and the pivoting means of which is attached to the frame of the hatchway, said lever extending in over the opening of the hatchway, and the outer or swinging end thereof being slidably connected to the lower side of the hatch.

A preferred constructional form of the operating device according to this invention is further described here below, reference being had to the attached drawing, in which Fig. 1 is an elevation, partly in section in a plane transverse to the axis of the pivots of the hatch, which shows in full-drawn lines a hatch for a cargo hold provided with an operating device according to the invention, in its raised or open position, and in dot-and-dash lines the hatch in its lowered or closed position. Fig. 2 shows the operating device viewed from above, and Fig. 3 shows a detail view of said device to an enlarged scale and partly in vertical section.

In the drawing, reference 11 denotes one side of a rectangular frame which surrounds a hatchway in the deck of a vessel. Articulated to said frame by means of joints or hinges 13 (one of which is shown) is a hatch which consists of two halves 15, 17 which are articulated to one another by means of joints or hinges 19 in such manner that the said halves can be raised from the closed position shown in dot-and-dash lines and can be folded against one another to the open position shown in full-drawn lines in Fig. 1. With this arrangement of the hatch, which is previously known per se, the operation of the hatch from one of the said positions to the other, is effected, according to the present invention, by the aid of a lever 21 which is pivotally attached to the frame 11 in such manner that it is capable of swinging in a vertical plane. The pivot of the lever is located at a slight distance below and inwards from the frame, that is, towards the centre of the hatchway, relatively to the joints or hinges 13 of the hatch. Due to this arrangement the lever 21 will occupy a position between the two halves 15, 17 of the hatch when the latter occupies its raised position. Consequently, the lever 21 is out of the way, so that it will not obstruct the loading and unloading, and it is also protected by the hatch from being damaged by the loads that are loaded or unloaded through the hatchway. The swinging outer end of the lever 21 carries a roller 23 which runs in a slot 25 in a guide attached to the lower side of the hatch, and which may be in the form of a vertical plate 27. When the hatch is

being raised or lowered the said roller 23 moves from the one end to the other of the said slot 25. The pivotal support of the lever 21 is attached to the side of the frame 11 approximately at the midpoint thereof so that the lever 21 will occupy a position in a plane approximately through the middle of the hatch and at right angles to the axis of turning thereof. It is easily understood that in place of a single lever it is possible to use two levers which occupy positions on either side of and at equal distances from the said middle plane and which are supported, for instance, in the vicinity of the corners of the frame of the hatchway.

The lever 21 is operated by means of a rotary motion producing hydraulic servomotor which is assembled with the pivoting means of the lever to form a unit therewith. The servomotor comprises a stationary shaft 29 and a housing 31 rotatable about said shaft. The shaft 29 is non-rotatably supported by two short brackets 33, 35 which are secured to the frame 11 of the hatchway. The housing 31 has a cylindrical portion or shell which has a larger inside diameter than the outside diameter of the shaft 29, and two end covers or shields which are journalled on and sealed against the shaft 29. In the space thus formed between the shaft 29 and the housing 31 there are provided radial blocks which divide the space into four separate chambers. The blocks 37, 39 are preferably made integral with the shaft 29 and have a sliding fit providing a seal against the cylindrical inner surface of the housing and against its end covers. The blocks 41, 43 are provided on the cylindrical shell of the housing, or on its end covers, and have a sliding fit providing a seal against the shaft 29 when the housing turns on the shaft. The chambers 45, 47 communicate through bores 49 in the shaft with a conduit 51, Fig. 2, for oil under pressure, which is attached to one end of the shaft 29, and the chambers 53, 55 (which have a relatively small volume in the extreme position shown in Fig. 3) communicate through bores 57 with a conduit 59, Fig. 2, for oil under pressure, attached to the opposite end of the shaft 29. By means of a hydraulic maneuvering system (not illustrated in the drawing) the conduits 51, 59 can be connected at will with the pressure side of a pump, so that oil or other pressure medium is supplied through the conduits to the chambers in the hydraulic servomotor, or so that the chambers are put under atmospheric pressure for the purpose of discharging the pressure medium from the same. In the position illustrated in Fig. 3 the chambers 53, 55 and the conduit 59 are under atmospheric pressure, while the chambers 45, 47 and the conduit 51 are connected to the pressure side of the pump and are under a hydraulic overpressure. The blocks 41, 43 attached to the housing 31 are thus forced against the stationary blocks 37, 39 and therefore, the lever 21 attached to the said housing securely maintains the hatch in the elevated position illustrated in Fig. 1. In order to further secure the said position and to render it possible, if desired, to shut off the pump when the hatch has been raised, a pivoted pawl 61 is provided which, in the said position of the hatch, engages a recess 63 in the outer surface of the housing 31. When it is desired to close the hatch the said pawl is first disengaged from the recess, after which the conduit 59 is put under pressure, while the conduit 51 is allowed to remain pressureless, or the pressure is removed therefrom. The chambers 53, 55 are thus filled with oil under pressure, and the blocks 41, 43 and the lever 21 which is attached to the housing 31 and thus to the said blocks, are turned clockwise in Figs. 1 and 3, while any oil remaining in the chambers 45, 47 is forced out therefrom.

It will be understood that the constructional form above described may be modified in respect to its details. For instance, the housing of the servomotor may be sta-

tionary, while the lever 21 may be attached to the shaft 29 which is then made rotatable, and in such case the pawl can be arranged to act upon the shaft or upon the lever.

I claim:

1. In an articulated hatch cover having pivotally connected inner and outer halves for closing a hatchway in the deck structure of a vessel, wherein said outer half, when said cover is opened, provides an upwardly projecting hatch wall, the outer edge of said outer half extending downwardly into said hatchway, the combination of hinge means pivotally attaching the inner edge of said inner half to the coaming of said hatchway, means for operating said hatch cover comprising a rotary vane type oscillating hydraulic servomotor located to one side of the axis of said hinge means and below the level of said hatch cover when in its closed position, said servomotor including a rotating operating arm movable in a vertical plane which is perpendicular to said inner half and extending, when said hatch cover is in closed position, in a substantially horizontal direction parallel to and beneath said inner half, the outer end of said operating lever slidably engaging the lower surface of said inner half to apply an upwardly directed lifting force to said inner half of said hatch cover, and bracket means mounting said servomotor on said coaming in a position such that when said cover is opened, said operating arm extends

substantially vertically between said halves and said servomotor is disposed between said outer edge of said outer half and said coaming, whereby the hatch wall provided by said outer half protects said servomotor and said operating arm from contact with goods being loaded through said hatchway.

2. An articulated hatch cover as claimed in claim 1 including a roller carried by said outer end of said operating arm, and a guide secured to said lower surface of said inner half and having a slot forming a track for said roller.

3. An articulated hatch cover as claimed in claim 1 in which said servomotor is provided with a rotatable housing, said operating arm projecting outwardly from said housing, a recess formed in said housing, and a pawl pivotally mounted on said bracket means for cooperation with said recess in order to lock said operating arm in its vertical position.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 24,238	Greer et al.	Nov. 13, 1956
2,256,087	Hay	Sept. 16, 1941
2,707,928	Farrell	May 10, 1955
2,820,515	Aarvold	Jan. 21, 1958
2,855,038	Greer	Oct. 7, 1958