Nov. 12, 1929. R. MacGREGOR 1,735,329

HATCH COVER

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Fig. 1.

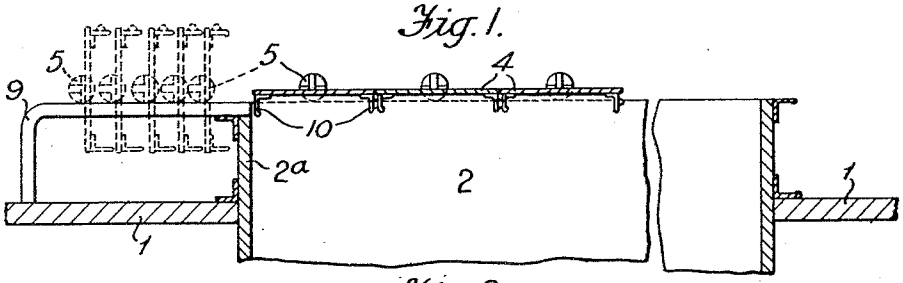


Fig. 2.

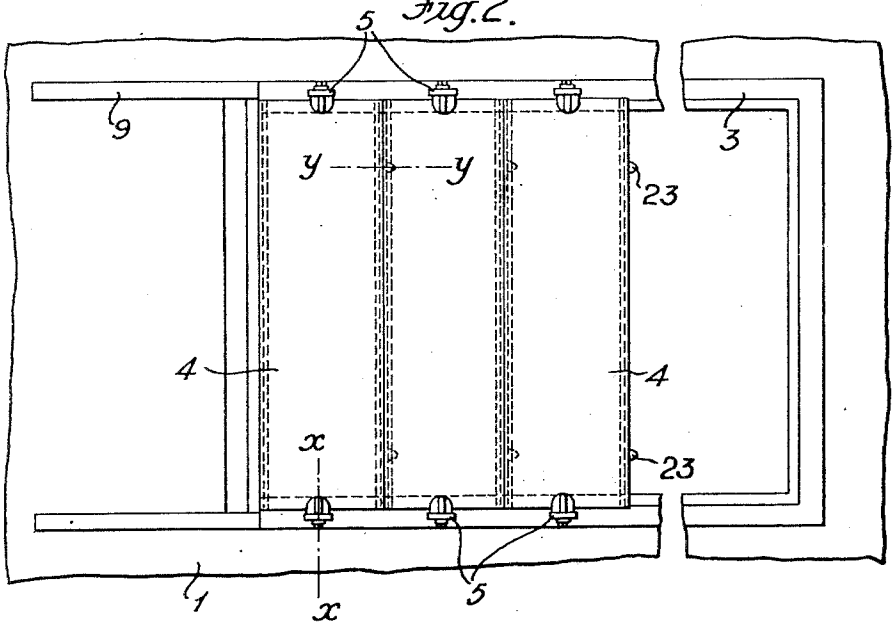
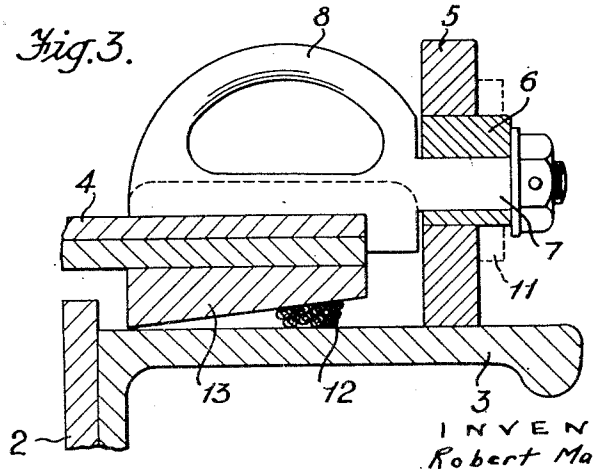


Fig. 3.



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Fig. 4.

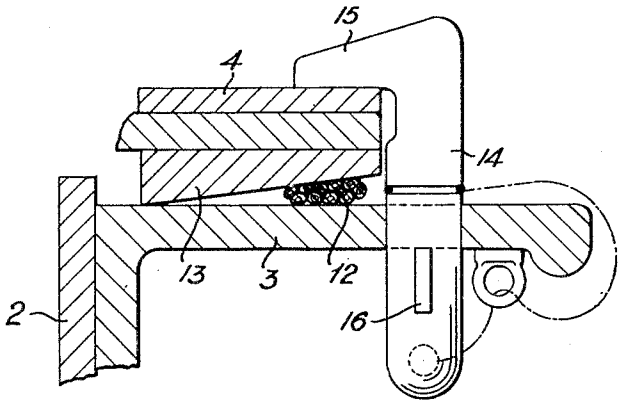


Fig. 5.

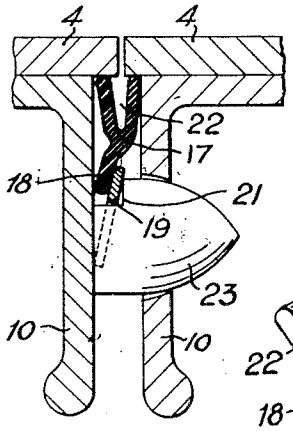
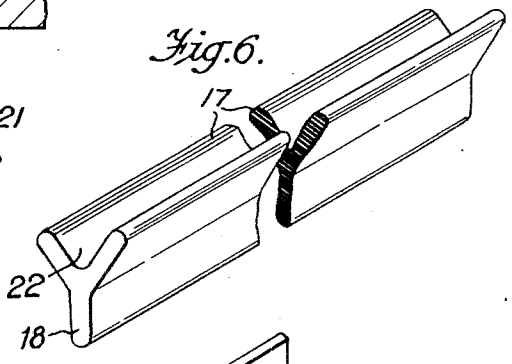


Fig. 6.



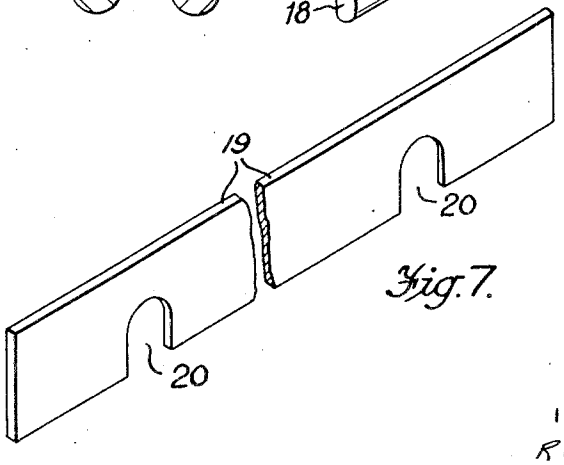


Fig. 7.

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Fig. 8.

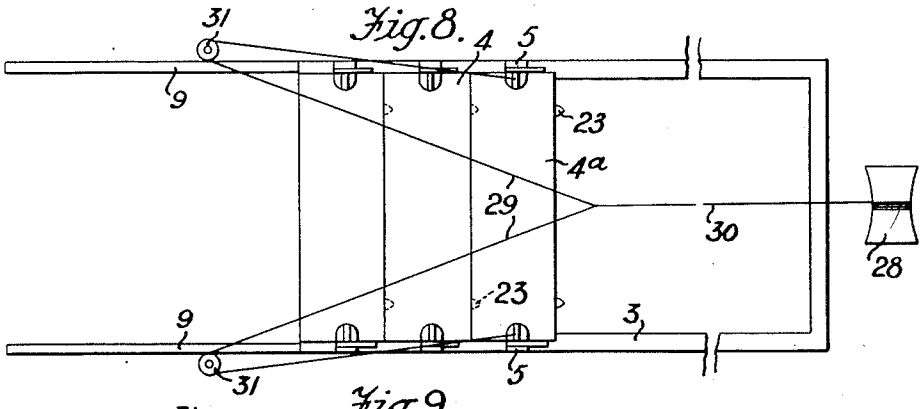


Fig. 9.

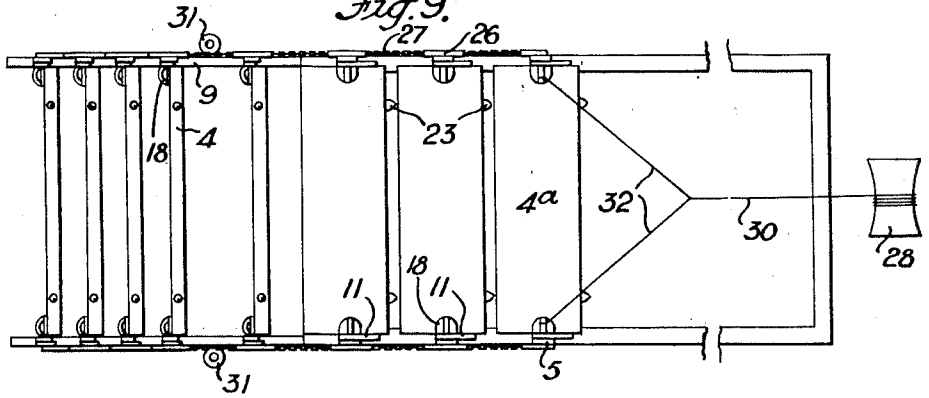


Fig. 10.

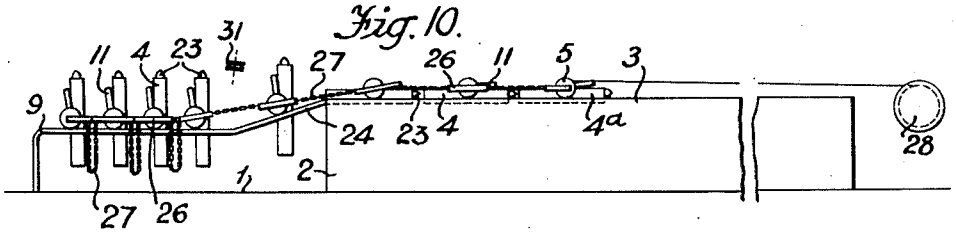
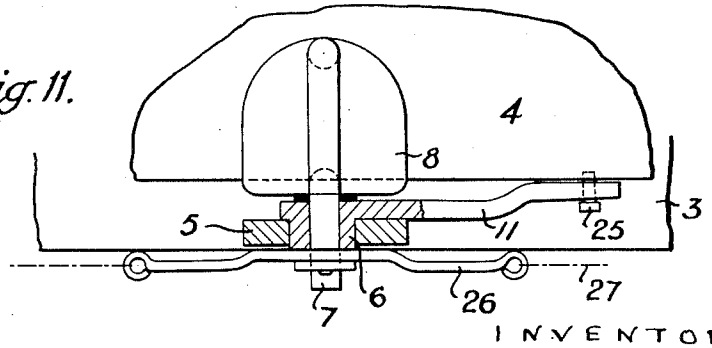


Fig. 11.



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UNITED STATES PATENT OFFICE

ROBERT MacGREGOR, OF LONDON, ENGLAND

HATCH COVER

Application filed August 21, 1928, Serial No. 301,113, and in Great Britain February 24, 1928.

This invention relates to ship's hatch covers of the kind comprising a plurality of cover plates adapted to assume co-planar covering positions over the hatch opening when in use and to be brought to collateral upstanding positions at the side of the hatch when not in use for covering purposes. The present invention is characterized in that a pair of rollers provided on each of the cover plates, one at each end each thereof, travel on the side coamings of the hatch, the construction being such that the plates are adapted to swing about the axes of the said rollers to vertical collateral non-covering positions. Further objects consist in providing means for mechanically moving the cover plates into and from their aforesaid covering and non-covering positions, and in constructing track rails or equivalent, on to which the cover plate rollers pass when said plates are moved into non-covering positions, with downwardly sloping portions which cause the cover plates to separate and become disengaged from one another by gravitating successively down the said sloping portions when moved along to non-covering positions.

In order to make the invention readily understood, reference is directed to the following description to be read in conjunction with the accompanying drawings, of which latter:—

Figure 1 is a fragmentary longitudinal section through the hatch constructed in accordance with the invention,

Figure 2 is a plan view of Figure 1,

Figure 3 is an enlarged section on line x—x in Figure 2,

Figure 4 is a fragmentary sectional view through a cover plate and hatch coaming, showing means that may be employed for exerting a closing pressure on the cover plates,

Figure 5 is a section on line y—y of Figure 2,

Figure 6 is a perspective view of a flexible weather strip that may be provided at the joints between plates,

Figure 7 is a perspective view of a rigid bar employed for retaining said weather strip in position,

Figure 8 is a plan view of the hatch illustrating the mode of moving the cover plates to non-covering positions,

Figure 9 is a plan view of the hatch illustrating the mode of moving the cover plates back to covering positions,

Figure 10 is a vertical longitudinal section through the hatch in a construction having sloping track rails, and

Figure 11 is an enlarged horizontal section on the axis of the rollers of one of the cover plates employed in the construction shown in Figures 8, 9 and 10.

In the drawings, reference 1 represents the ship's deck, 2 the hatch coaming and 3 external flanges of the hatch coaming, which can be either integrally formed with said coaming or consist of angle-section bars affixed thereto.

Each of the cover plates 4 is furnished with a pair of rollers 5 arranged one at each end of the plate and positioned centrally of its width, each of said rollers being mounted to rotate about a bush 6 eccentrically bored to take an axle 7 which is formed integrally with an eye plate 8 attached rigidly upon the cover plate 4 as shown in Figure 3. The said rollers are adapted to roll along the flanges 3 at the top of the side coamings of the hatchway, and enable the plates to be moved along the hatch from their normal co-planar covering positions in which they are shown in full lines in Figure 1 to their vertical uncovering positions (as shown dotted) in which they are clear of the area of the hatch opening. In thus moving from the one position to the other, the rollers after rolling along the flanges 3 pass off of the same and roll on to track rails 9 arranged at one end of the hatch with their upper surfaces as flush continuations of the upper surfaces of the flanges 3 of the hatch side coamings. The said track rails 9 may consist of integral extensions of the said side coamings but preferably consist of separate bars supported from the deck 1.

In moving the cover plates from their covering to out-of-use positions they are moved horizontally along until clear of the hatch opening, when they are swung about the axles 7 to their vertical positions. The end wall 2^a of the hatch is reduced in height in order to allow downwardly depending walls 10 of the

plates to pass when the plates are being moved along. The projecting portions of the eccentric bushes 6 are of hexagonal form and adapted to receive a spanner 11 (Figure 3) by operating which the cover plate may be raised or lowered with respect to the axis of the roller 5; thus, after bringing the cover plate to the required covering position it may be lowered by partially rotating the bush 6 in order to cause it to take a firm bearing on the top of the hatch coaming.

In order to form a watertight joint around the contour of the composite hatch cover, suitable packing such as a rope 12 can be interposed between the plates 4 and the flanges 3 of the hatch coaming after bringing the plates to required positions and before lowering same, and a taper—or wedge—section bar 13 affixed to the underneath of the overlapping part of each cover plate, comes to bear on such packing when said cover plate is lowered as above described. If necessary said wedge-section bar 13 may be longitudinally grooved in order to prevent the packing 12 moving laterally out of position.

In order to ensure of a firm seating of the cover plate a number of pins 14 (Figure 4) may be swivelly mounted in the coaming flanges 3 in suitable positions, having lateral heads 15 adapted to bear on the upper surfaces of the various cover plates, and being slotted in order to receive tapering cotters 16 adapted to bear against the undersurfaces of the coaming flanges, by means of which the plates 4 are firmly pressed down into place. The said pins 14 are adapted to be turned about the axes of their stem portions from the cover-plate-engaging positions shown, to an alternative position in which their lateral heads 15 are clear of the plates, so as to allow the latter to be raised and moved as required. Conveniently the said pins may be so positioned that the head of each is adapted to bear upon two adjacent plates, that is to say by arranging said pins in line with the positions assumed by the meeting edges of adjacent plates. The heads 15 may be splayed out if necessary.

In order to ensure of correct positioning and engagement of the adjacent cover plates 4 with one another when in covering positions, downwardly-extending walls 10 on the cover plates 4 disposed adjacent and parallel to their abutting edges, have a stud and hole engagement with one another. That is to say at each joint between adjacent plates, the adjacent wall 10 of one plate is furnished with two or more projecting studs 23, which may have pointed or rounded noses, each of said studs taking into an aperture in the adjacent wall 10 of the next plate, as shown in Figure 5.

The said downwardly-extending walls 10 of the plates 4 may be formed integrally therewith but preferably are constituted by portions of bulb angle-section or other suitable section stiffening bars attached to the undersides of said plates 4, and the disposition of the said walls 10 is such that when adjacent plates abut, a space exists between their respective adjacent walls 10. Within the said space is accommodated a channel section flexible rubber strip 17 having a lower extension 18, adapted to be clamped against the wall 10 having the studs 23, by means of a rigid metal, wooden or other strip 19 having lateral slots 20 adapted to engage over the studs 23, the studs being undercut as shown at 21 to provide a shoulder against which the rigid strip 19 bears.

The channel 22 of the flexible rubber strip 17 is upwardly directed and is located immediately below the abutting edges of the adjacent cover plates. The said channel 22 may if desired be filled with tallow or any other suitable waterproofing substance of a plastic nature, and the action of moving adjacent plates together causes compression of the channel 22 between the approaching walls 10 of the adjacent plates, whereby the tallow or the like is forced up into the joint between the adjacent plates, thus forming a watertight joint. The channel strip 17 may be modified from the particular construction shown; for instance it could consist simply of a longitudinally split rubber tube with its opening uppermost, mounted on a rigid bar supported horizontally on the studs by being affixed thereto or lying in the undercut recesses thereof, or a plain rubber strip could be used adapted to be forced up against the joint by its compression.

It is convenient to use a tarpaulin sheet as a waterproof cover for the composite cover, the edges of which may be clamped under the edges of the cover plates which overlap the hatch coaming flanges.

Instead of the studs 23, any equivalent projections may be provided.

If desired the stud-and-hole engaged walls 10 formed by bulb angle-section stiffening bars or otherwise, may project upwardly above the cover plates instead of projecting downwardly therefrom.

A similar device to that shown in Figure 4 may be used for locking in position a vertical channel bar for closing the space between the hatch coaming and cover plates at the end of the hatch where covers are intended to slide off.

In the construction shown in Figure 10, track rails 9 on to which the rollers pass when the covers are clear of the hatch-way, are each formed with a downward sloping portion 24. When the rollers 5 of a cover plate being moved to non-covering position reach the downwardly sloping portions 24 of the track rails 9 the plate automatically gravitates down said rails, and in so doing the studs 23 furnished on said plate for cor-

rectly positioning same, with respect to an adjacent plate, become disengaged from said adjacent plate due to the plates separating. After thus gravitating the plate automatically swings to vertical position, due to the fact that, in practice, the rollers 5 are positioned slightly to one side of the longitudinal centre line of the plate so that there is unequal distribution of the weight of said plate about the rollers, that is to say, more weight on one side of the roller axis than on the other side.

As shown in Figures 10 and 11 each of the rollers is mounted to rotate about a bush 6 eccentrically bored to take an axle 7 formed integrally with an eye-plate 8 attached rigidly upon the cover plate 4. Partial rotation of the said bush 6 causes the plate 4 to rise or fall according to the direction of rotation, as above described and the said bush 6 is formed with an integral lever extension 11 to facilitate manipulation of said bush, and a pin 25 adapted to be passed through said lever and into the end of the cover plate may be provided for retaining the lever in set position.

A metal link 26 also is mounted on the axle 7, and lengths of chain wire-rope or equivalent 27 connect the link 26 of one plate with the corresponding link of the next plate throughout the series of plates, their lengths being sufficient to allow of adjacent plates separating such a distance as to disengage from one another.

Movement of the plates to and from covering and non-covering positions is effected by means of a winch 28 located at the end of the hatchway remote from that end at which the plates are accommodated when in non-covering positions.

As shown in Figure 8, in order to move the plates to non-covering positions the two portions of a bridle 29 connected to a rope or equivalent 30 being wound on the winch are passed around sheaves 31 suitably supported from the rails 9 or deck 1 and the doubled-back portions of the bridle 29 are attached to the eyes of the eye-plates of the endmost plate 4^a. It will follow that when the winch operates the plate 4^a is moved in a direction towards the hatch end at which the plates are accommodated when clear of the hatch, and such movement of the said plate 4^a pushes the other plates successively on to the track rails 9, and when their rollers reach the inclined portions 24 of said track rails, said plates become successively disengaged from one another and swing to vertical positions. Referring to Figure 9, in order to replace the plates to covering positions, a bridle 32 connected to the winch rope 30 is attached at its ends to the eye plates of the plate 4^a and the rope 30 being wound on the winch obtains a direct pull on the plate 4^a so as to pull same to covering position. The chains 27 which couple the cover plates together cause the remaining plates to be drawn along, and the final closing together of the plates can be effected by hand.

If desired the levers 11 of the adjacent plates may be coupled by lengths of chain or the like or other suitable connection means so as to provide for actuating all the said levers simultaneously.

I claim:

1. A hatch cover for ships' hatches comprising a plurality of cover plates adapted to assume co-planar covering positions over the hatch opening, a pair of rollers on each cover plate arranged one at each end thereof and adapted to travel on the hatch side coamings, and a mounting for each roller consisting of an eccentric bush adapted to be partially rotated in order to raise and lower the cover plates when in covering positions, the plates being adapted to swing about the axes of the rollers to vertical collateral non-covering positions.

2. A hatch cover for ships' hatches comprising a plurality of cover plates adapted to assume co-planar covering positions over the hatch opening, ribs on said cover plates disposed near the meeting edges thereof so that at each joint between plates, a space exists between the adjacent ribs of adjacent plates, studs on some of said ribs and apertures in the remaining ribs for the reception of said studs, and channel-section flexible strips one for each joint between the plates, said flexible strips being carried by the studs and each being arranged with its channel upwardly directed so that said channel is located immediately below the abutting edges of adjacent plates.

3. A hatch cover for ships' hatches comprising a plurality of cover plates adapted to assume co-planar covering positions over the hatch opening, a pair of rollers on each cover plate arranged one at each end thereof in such a manner as to afford unequal distribution of the weight of the plate and adapted to travel on the hatch side coamings, each plate being adapted to swing about the axes of its rollers, track rails in continuation of the upper surfaces of the hatch side coamings, a downwardly sloping portion to each track rail arranged to cause the cover plates to separate by gravitating successively down the said sloping portions, and to swing to vertical positions owing to their unequal weight distribution, and means for mechanically moving the cover plates to co-planar covering positions and alternatively on to the track rails.

4. A hatch cover for ships' hatches comprising a plurality of cover plates adapted to assume co-planar cover positions over the hatch opening, a pair of rollers on each cover plate arranged one at each end thereof in such a manner as to afford unequal distribution of the weight of the plate and adapted to

travel on the hatch side coamings, each plate being adapted to swing about the axes of its rollers, positioning studs projecting from ribs on the cover plates disposed near the meeting edges of said plates, apertures in other ribs of said plates for receiving said studs so that there is a stud engagement in the case of each two adjacent plates, means for coupling the plates together arranged to allow sufficient separation of the plates to permit disengagement of the positioning studs, track rails in continuation of the upper surfaces of the hatch side coamings, a downwardly sloping portion to each track rail arranged to cause the cover plates to separate and effect stud disengagement by gravitating successively down said sloping portions and to swing to vertical positions owing to their unequal weight distribution, and means for mechanically moving the cover plates to co-planar covering positions and alternatively on to the track rails.

5. A hatch cover for ships' hatches comprising a plurality of cover plates adapted to assume co-planar covering positions over the hatch opening, a pair of rollers on each plate arranged one at each end thereof and adapted to travel on the hatch side coamings, a mounting for each roller consisting of an eccentric bush adapted to be partially rotated in order to raise and lower the cover plates when in covering positions, the plates being adapted to swing about the axes of the rollers to non-covering positions, means whereby the plates are caused to engage together, means for coupling together the plates in such a manner as to afford sufficient separation thereof to allow of disengagement of their inter-engaging means, actuating levers formed integral with the eccentric bushes for manipulating same, and means for coupling together said actuating levers so as to provide for simultaneous actuation of the various eccentric bushes.

In testimony whereof, I have signed my name to this specification at London, England this 27th day of July, 1928.

ROBERT MacGREGOR.