

Feb. 12, 1929.

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J. S. WOOD

HATCH COVER

Filed May 29, 1925

4 Sheets-Sheet 2

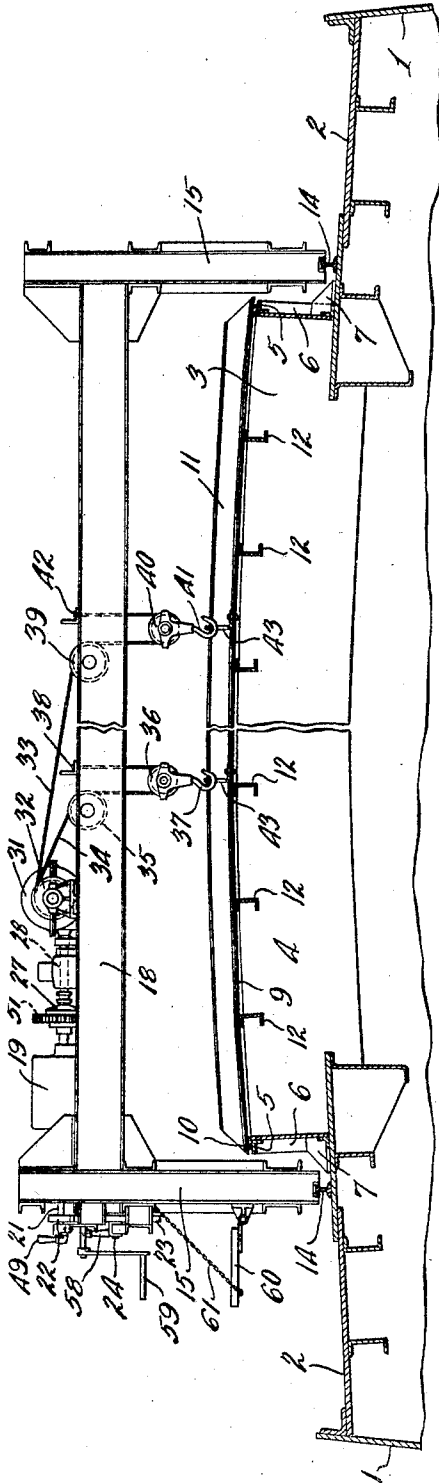


Fig. 3

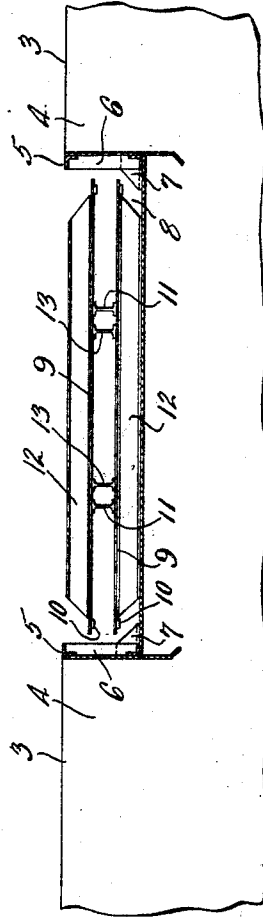


Fig. 4

Inventor

Joseph S. Wood

By Brockett, Hyde & Milburn
Attorneys

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J. S. WOOD

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4 Sheets-Sheet 3

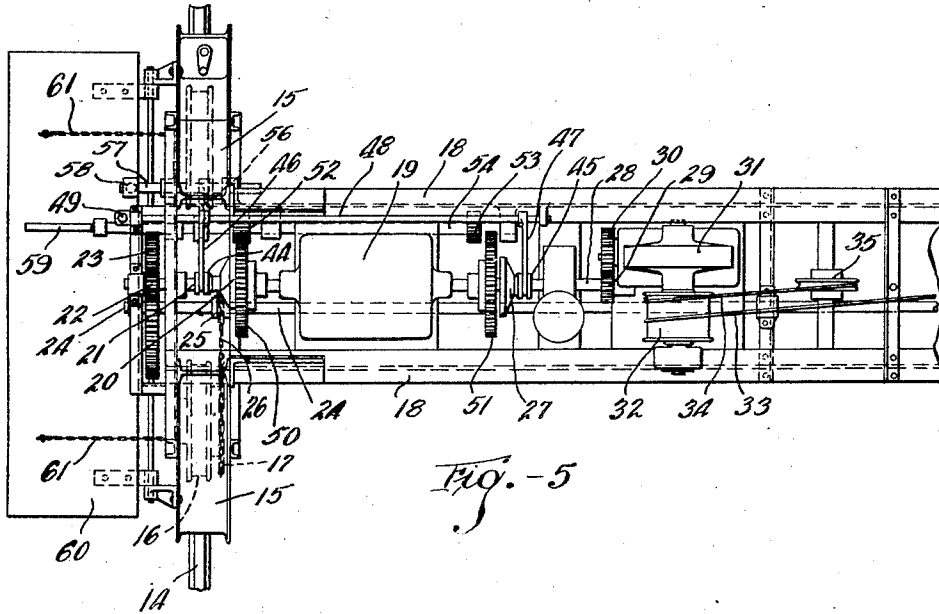


Fig. -5

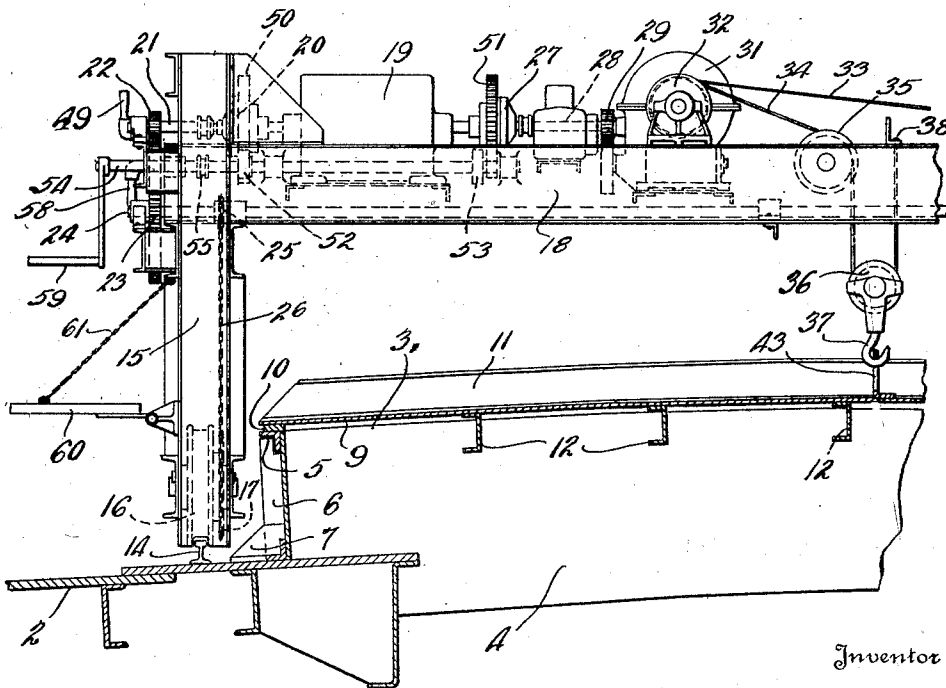


Fig. -6

Inventor

Joseph S. Wood

By Brockett, Hyde & Milburn

Attorneys

Feb. 12, 1929.

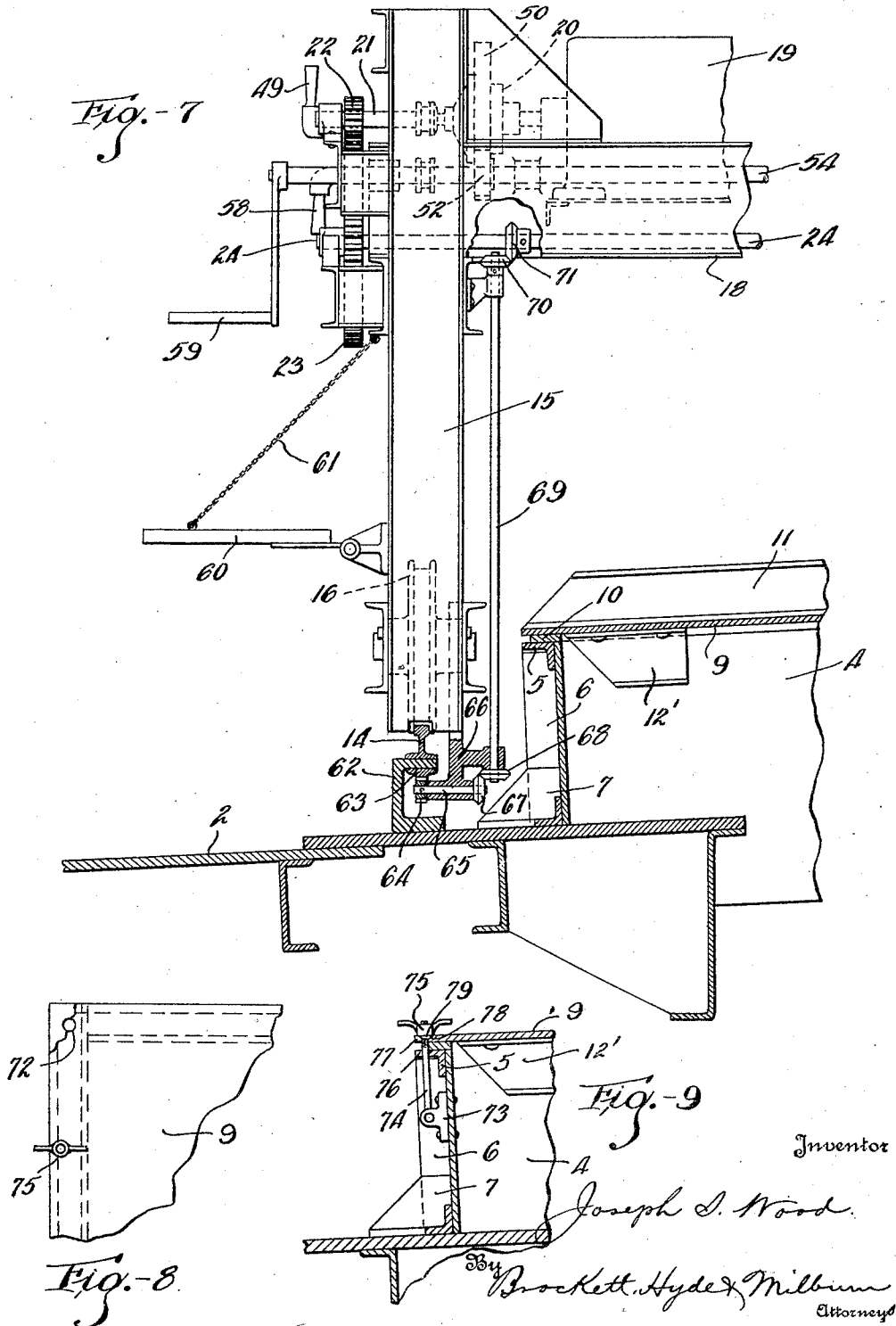
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J. S. WOOD

HATCH COVER

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE.

JOSEPH S. WOOD, OF CLEVELAND HEIGHTS, OHIO.

HATCH COVER.

Application filed May 29, 1925. Serial No. 33,741.

This invention relates to freight boat construction and particularly to the hatches, their covers and mechanism for handling the same.

5 The handling of ore or coal on the Great Lakes has developed many new principles of construction and operation of freighters. Among the various developments there is the one of loading and unloading through the
10 hatches. At various points on the lakes where ore and coal are loaded into the hatches the loading shoots as well as the unloading devices are installed on 24 foot centers so that for proper loading the hatches through the
15 decks for the various freight boats must be arranged on 24 foot centers in order for the boats to be universally capable of loading and unloading at the various docks. These
20 hatches are covered, when the boat is in transit from one dock to another, by various covering or closing devices, one very effective form of prior construction being the nesting sectional hatch cover which is made up of a plu-
25 rality of transverse sections arranged to slide one upon the other and nesting in a pile as it were, beyond the end of the hatch on suitable bars suitably arranged on the sides of the hatch coaming. All of these arrangements
30 take up room at the ends of the hatch or at the only points where there are through passages from one end of the boat to the other. It has become good practice to provide hatches with covers, provided with gaskets, which are arranged to be seated on the upper
35 edges of the hatch coaming to prevent the wash from getting into the hold of the vessel. When these covers are made in a single piece, it is extremely difficult to find storage room upon the deck when the hatches are given suf-
40 ficient opening and furthermore there has been no very good way of handling them.

It is to be noted further that with all of the covers heretofore utilized, it has been necessary to provide tarpaulin covers which are
45 spread over the hatch covers and brought down on the sides where they are batten down by ropes and wooden strips on the side of the coamings. These covers do not al-
50 ways prevent the sea from washing into the hatches and furthermore, they present considerable difficulty in handling at all times and especially in cold weather when they are covered with snow and ice. Furthermore
55 none of the covering devices heretofore used tend to strengthen or brace the deck portion of the vessel.

The present invention is designed to overcome many of the foregoing difficulties and to provide an arrangement of hatches and covers therefor together with suitable mechanism
60 for handling the covers so that a freighter moving into port may clear its hatches ready for unloading and without disturbing the normal deck clearances used for passage from one end to the other. The invention contem-
65 plates hatches of substantially 11 foot width arranged on 24 foot centers thereby leaving intervening hatch cover storage spaces of approximately 13 feet. It also contemplates the use of one-piece covers suitably braced to
70 maintain their shape and camber and provided with means whereby load hooks from a crane may be readily applied to a cover to raise the same, after which the crane is moved
75 along until the cover registers with the space between the hatches when it is lowered and the next cover removed in like manner. Since
80 it is customary to utilize as much of the hold as possible for ore and coal, it becomes necessary to provide as many hatches as possible, always maintaining the same center distance. This also presents the difficulty in this present
85 arrangement of taking care of the last hatch cover and to provide for this difficulty the last hatch cover has its parts, such as the strengthening ribs, arranged in staggered relation
90 with respect to the parts of the preceding cover so that two covers may be piled, one upon the other, avoiding the necessity of otherwise disposing of the cover at the end of the row.

The present invention also contemplates the rigid clamping of the hatches to the coamings for the purpose of drawing the cover tightly
95 down upon the gaskets used to prevent leakage and also for the purpose of strengthening and re-enforcing the entire deck of the vessel.

The invention may be further briefly summarized as consisting in the construction and arrangement of parts hereinafter set forth in
100 the drawings, description and claims.

In the drawings, Fig. 1 is a top plan view showing the deck of a freighter with some of the hatch covers in place and others removed
105 and arranged between hatches; Fig. 2 is an end view of the hoist frame; Fig. 3 is a transverse section through the deck showing the hatch and cover in section and showing the hoisting mechanism in side elevation taken
110 on line 3—3, Fig. 1; Fig. 4 is a sectional view upon the line 4—4, Fig. 1; Fig. 5 is a top plan view of a portion of the hoisting mechanism;

Fig. 6 is a side elevation of a portion of the hoisting mechanism; Fig. 7 is an enlarged sectional view of part of the frame with a modified form of drive for moving the crane along from one hatch to another; Fig. 8 is a detailed view in plan partly broken away showing aligning openings between the cover and coaming for aligning the covers; and Fig. 9 is a detailed view showing the clamping means for the cover.

In the drawings 1 represents the hull of a freighter provided with the usual steel plate deck 2 and having therein a plurality of transversely extending hatch openings 3 each provided with a coaming 4 of the usual vertically extending plate structure. The upper outer edge of this coaming 4 is re-enforced by an angle 5 extending around the outside of the upper margin. At intervals along the sides and ends the coaming itself, and especially the angles 5, are re-enforced by vertically extending braces 6 and gussets 7 rigidly secured in place. The arrangement of these strips 6 and gussets 7 is such that they support the coaming and also support the angles 5 from being broken down by the unloading buckets. These angles present a broad flat face for a gasket, as will appear. As stated, the hatches are on 24 foot centers with the hatch opening 11 feet in width so that intervening spaces 8 are provided for the covers and the bracing strips 6 are equal in width to the outwardly extending flanges of the angles 5 on the sides of the coamings so that the covers are directed to their proper space between the hatches and are prevented from engaging underneath the angles 5 when the hatch covers are raised from their storage spaces.

Each hatch coaming is adapted to receive a cover and each cover consists of a cover plate structure 9 arranged to fit over the upper margin of the hatch coaming and provided with a gasket 10 of rubber or other similar sealing medium. Since it is the practice in the construction of freighters to have a camber in the deck, the hatch coamings at their sides are provided with a camber or arch so that their covers must have the same arch or camber and to maintain this configuration each cover except the last one is provided on its upper surface with longitudinally extending I-beams 11, preferably two in number, suitably distributed across the width of the cover. These I-beams are given the proper curvature to maintain the camber of the cover. Each cover is also strengthened transversely by cross channels 12 arranged on its underside. These cross channels are mitered at their ends and extend to the coaming when the cover is in place and therefore form guides to center the cover as it moves to its seat. The ends of the cover on the underside are provided with guiding members 12', Fig. 7, mitered at the end for centering the cover longitudinally. In the case of the special

cover where the cross braces are on the top the sides of the cover on the underside are provided with a suitable number of guiding members 12' to center this particular cover. In the case of the last cover, which must be stacked upon its preceding cover, the longitudinal I-beams 13 corresponding to the I-beams 11 are arranged upon the underside and its transverse bracing channels 12 are arranged upon the upper side, the longitudinal bracing strips being out of registration with the bracing beams 11, as shown clearly in Fig. 4.

It will be seen from the foregoing construction and arrangement that since the covers extend over the margins of the hatches they may be removed and stored between hatches except in the case of the last one wherein the last cover, by reason of its peculiar construction, may be stacked upon the one preceding. In this way the maximum deck clearance is provided and the passage ways along the ends of the hatches are not obstructed by any means for supporting or storing the hatches when not in place upon the hatch coamings.

In order to properly handle the hatch covers, suitable hoisting and conveying means, common to all hatches, is provided and the arrangement contemplates the use of rails 14 extending fore and aft and along ends of the hatches. Mounted upon these rails is a travelling crane or hoist and it comprises A-shaped end frame members 15, each provided with a pair of supporting wheels 16 one of which is provided with a sprocket 17. These two A-frame members are secured together by suitable sills or cross members 18 properly braced to provide a rigid substantial travelling crane extending over the hatches and arranged to travel from one end of the boat to the other throughout the region of the hatch openings. Arranged upon the frame work thus provided is an electric or other motor means 19 connected by a clutch mechanism, generally indicated at 20 and of any preferred construction, to the shaft 21. This shaft 21 through a pinion 22 drives a gear 23, arranged upon a shaft 24 extending from one end of the frame to the other and provided with two sprockets 25 each provided with a chain 26 engaging the corresponding sprocket 17 upon one of the driving wheels. The opposite end of the motor shaft is provided with a clutch generally indicated at 27, which connects the motor shaft to a hoist driving shaft 28 provided with a pinion 29 meshing with a gear 30 upon the shaft of a worm drive generally indicated at 31 and adapted to drive a drum 32 for receiving a pair of cables 33 and 34. The cable 34 extends over a suitable guide sheave 35 and under a sheave 36 of a load hook 37 and thence upward where it is dead-ended at 38 in the frame. The other cable 33 extends over a sheave 39 thence downward under a sheave

40 of another load hook structure 41 and is thence extended upward and dead-ended in the frame at 42. The two load hooks are adapted to be engaged in suitable loops or
 5 eyes 43 secured to the upper surface of the hatch covers at suitable points to balance and handle the load of the cover. In order to manipulate the clutches 20 and 27 their operating members 44 and 45 are engaged by arms
 10 46 and 47 respectively. These arms are rigidly mounted upon a shifting rod 48 which extends out at the left end of the frame, as shown in Fig. 5, and is there provided with an operating handle 49 which may be moved
 15 back and forth to shift one or the other of the clutches, according to whether the crane is to lift or to travel, as is readily obvious. It may be necessary for one reason or the other to drive the crane by hand in which case
 20 the clutches 20 and 27 are both provided with gear wheels 50 and 51 which are adapted to mesh with pinions 52 and 53 respectively, these pinions being arranged upon a shaft 54 in such spaced relation that when one is in
 25 engagement with one of the gear wheels, the other is out of engagement. Their arrangement is also such that they may both be moved out of mesh. To produce this movement the shaft 54 is provided with a collar 55 engaged
 30 by an arm 56 secured to a shifting rod 57 and provided with a handle 58 at the left or operating end of the crane. The shaft 54 is provided with a hand crank 59 which may be used to rotate the shaft 54 and operate the
 35 crane for travel or for lifting purposes. The left hand end of the crane is the operating end, as has been indicated above, and a suitably hinged platform 60 is provided and it is supported in lowered position by chains 61
 40 secured to the frame.

In practice as the freighter is reaching its destination or port the crane is moved above the hatch No. 1 and its load hooks engage with the eyes on the hatch cover. The operator then lifts the cover and moves the crane to the adjacent intervening space between
 45 No. 1 and No. 2 hatches where the cover may be stored or deposited out of the way. This operation is continued down through the series of hatches until the last hatch is reached when its cover, by its peculiar arrangement, is moved back over the cover of the preceding hatch and stored upon it.

The reverse operation is repeated for returning the covers to their various hatch coamings.

In the arrangement shown in Fig. 7 the A-frame members 15 are supported on the wheels 16 as in the other construction, except
 60 that none of these wheels drive the crane but merely travel upon the rails 14 which are supported upon channels or channel shaped brackets 62 arranged upon the deck at the ends of the hatches with the opening of the channel toward hatch coaming, as shown in

Fig. 7. On the underside of these channels or channel shaped brackets, and on each end of the hatches and just below the rails there is a longitudinal rack 63 adapted to be engaged by a pinion 64 carried by a shaft 65
 70 arranged in a hanger or bracket 66 secured to the corresponding A-frame. This shaft 65 is driven through bevel gears 67 and 68 by vertical shaft 69 which through bevel gears 70 and 71 is driven by shaft 24. It is to be
 75 understood that there is a like mechanism in connection with the other A-frame so that both A-frames are moved in unison and at the same rate along the deck. This arrangement ensures the hoisting mechanism being normal to the line of its travel whereby the covers are raised and lowered in perfect alignment with the hatch coamings and the storage spaces between the hatches.

To ensure the maximum of alinement of
 85 the covers with their coamings each cover at its four corners is provided with an opening 72 adapted to be alined with a corresponding opening in the flange of the coaming so that a bar of suitable size may be used by the operators in properly alining the covers. These openings are outside of the gasket. This arrangement is shown in Fig. 8.

The cover may be held down by any suitable means but I prefer to provide a different
 95 clamping mechanism which in the present instance comprises blocks or brackets 73 spaced at intervals around each hatch coaming, and each pivotally supporting a clamping bolt 24 provided with a wing nut 75. These bolts
 100 pass through slots 76 in the flange of the coaming and through slots 77 in the edge of the cover. The material of the cover within the slot is recessed to provide a seat 78 for the rounded portion 79 of the nut.

It will be seen from the foregoing that when the cover is in place the operators apply the clamping bolts and screw them down against the gasket 10 which results in a tight joint and causes the entire deck to be
 110 strengthened by the cover structures.

What I claim is:

1. The combination of a boat having a plurality of similar hatch openings spaced from each other a distance greater than the width
 115 of a hatch, covers for said hatches, said covers being of a width less than the space between hatches whereby said covers are capable of storage between hatches, and guiding members carried by the hatches for guiding the
 120 covers into the spaces therebetween.

2. The combination of a boat having a plurality of similar hatch openings spaced from each other a distance greater than the width
 125 of a hatch, a coaming for each of the hatches, flanges carried by the upper edges of said coaming, covers for the hatches adapted to be stored in the spaces between hatches, and vertical guiding means on the sides of the hatch coamings to guide the covers into place and to
 130

prevent their engaging the flanges at the edges of the coamings.

3. The combination of a boat having a pair of spaced hatches, a cover for each of said hatches, the space between said hatches being of sufficient extent to receive both of said hatch covers when the same are arranged one upon the other, each of said hatch covers being provided with a pair of spaced re-inforcing strips, one of said hatch covers having its strips arranged on its under surface, while the other hatch cover has its re-inforcing strips arranged on its upper surface, and means for removing said hatch covers from their hatches and storing them one upon the other in the space between said hatches.

4. The combination of a boat having a pair of spaced hatches, a cover for each of said hatches, the space between said hatches being of sufficient extent to receive both of said

hatch covers when the same are arranged one upon the other, each of said hatch covers being provided with a pair of spaced re-inforcing strips, one of said hatch covers having its strips arranged on its under surface, while the other hatch cover has its re-inforcing strips arranged on its upper surface, and means for removing said hatch covers from their hatches and storing them one upon the other between said hatches, the re-inforcing strips of one of said hatch covers being differently spaced from the re-inforcing strips of the other hatch cover, so that said hatch covers may be stored in the space between the hatches one upon the other with their re-inforcing strips toward each other in staggered relation.

In testimony whereof I hereby affix my signature.

JOSEPH S. WOOD.