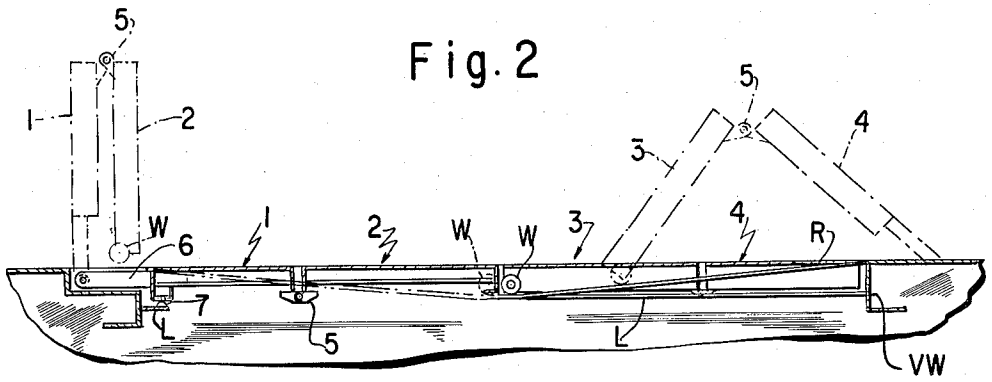
July 24, 1962 G. STRANSKY 3,045,632

HATCH COVER ARRANGEMENTS

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Fig. 2



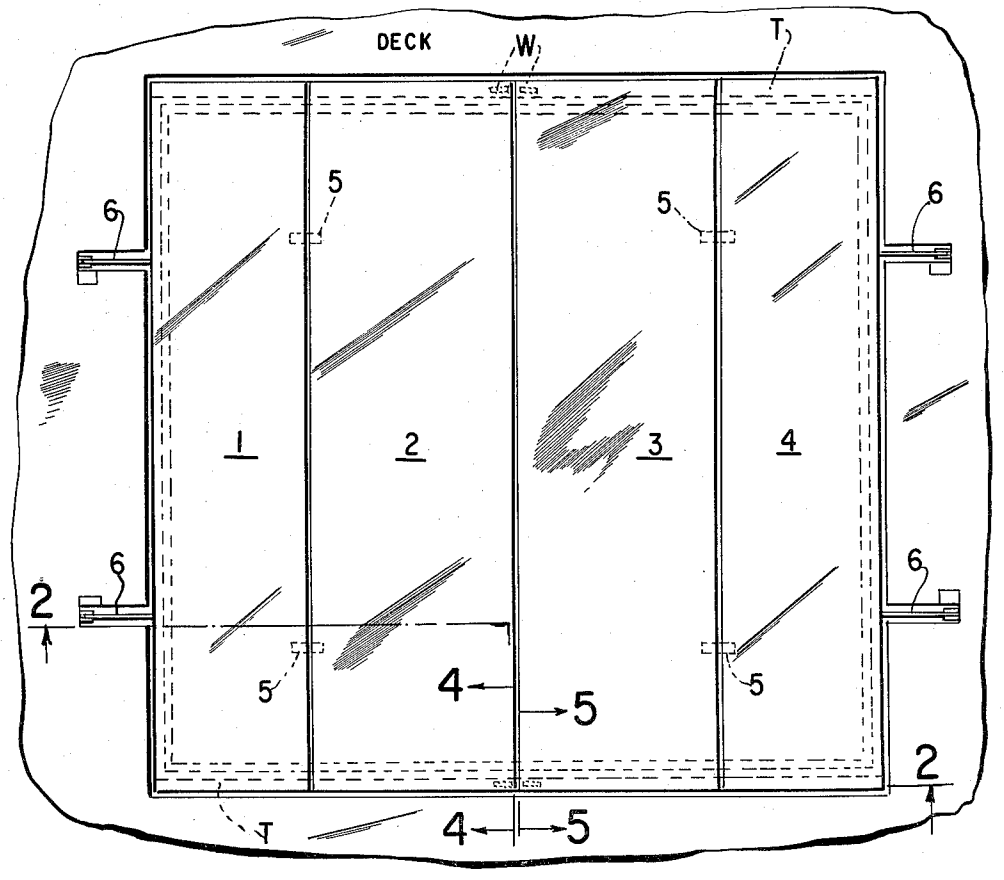


Fig. 1

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HATCH COVER ARRANGEMENTS

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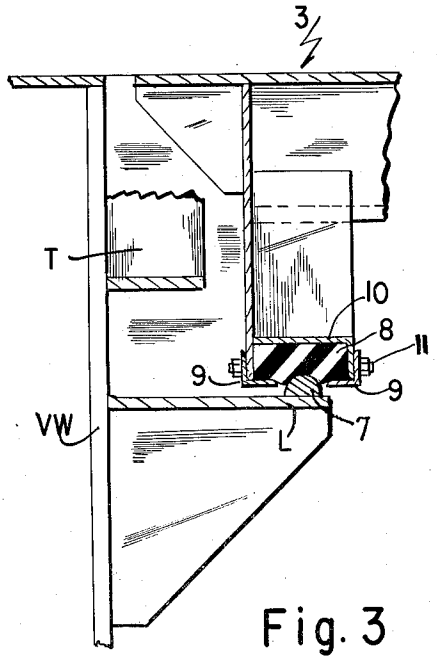


Fig. 3

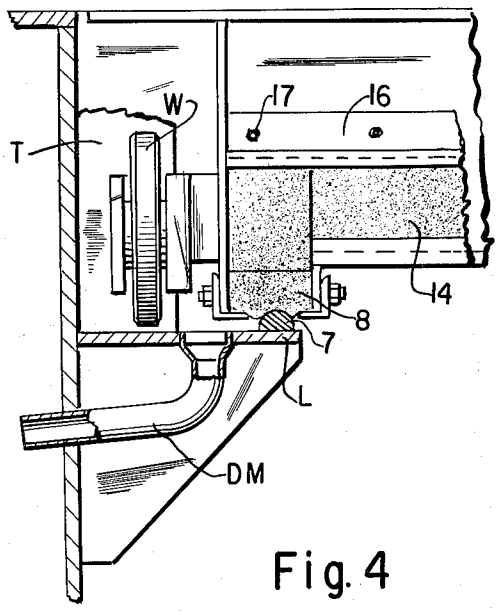


Fig. 4

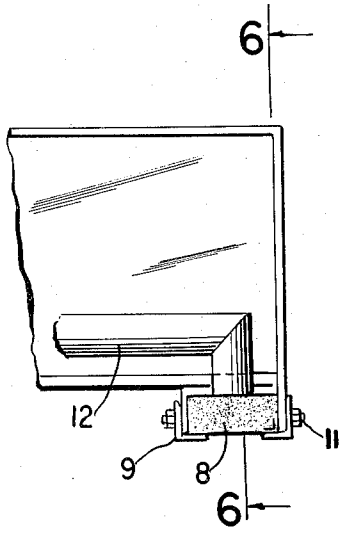


Fig. 5

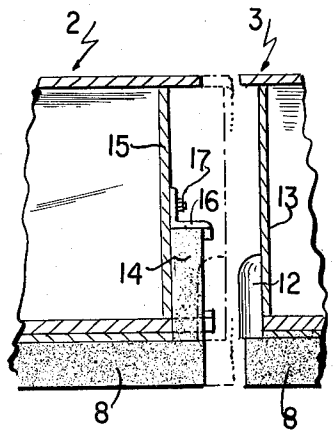


Fig. 6

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United States Patent Office 3,045,632 Patented July 24, 1962

3,045,632

HATCH COVER ARRANGEMENTS

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Filed Dec. 14, 1959, Ser. No. 859,177
5 Claims. (Cl. 114—202)

This invention relates to the art of ship-building with particular reference to improvements in hatch cover constructions of the flush-type and this application is a continuation-in-part of my prior filed application, Serial No. 449,368, filed August 12, 1954, now Patent 2,917,017, dated December 15, 1959 and entitled "Hatch Cover Arrangements."

As set forth in the said prior application and also in my Patent 2,869,501, dated January 20, 1959, and entitled "Water-Tight Hatch Covers," I have disclosed flush-type hatch cover arrangements in which a ledge extends around the inside of the vertical girder or wall means that delimit the opening in the deck and this ledge is so coordinated as to its depth relative to the vertical dimensions of the girder means and the vertical dimensions of the hatch cover, that the top of the hatch covers lie at least approximately flush with the surface that defines the top of the opening.

In the said prior applications, I have disclosed and claimed certain sealing relationships, that is, the combination of metal sealing components and gasket stripping extending around the periphery of the opening and transversely across the opening on adjacent ends of adjacent hatch covers, so that the hatch opening is sealed.

In prior application, Serial No. 449,368 I have disclosed an arrangement in which the peripheral seal around the opening is provided by gasket stripping carried by the cover adjacent the upper edge thereof and a cooperating metal sealing means is carried by the wall means that delimits the opening either at or adjacent the upper edge of the opening. That application further discloses, in combination with the immediately aforedescribed peripheral seal, the provision of a compression bar on the ledge that extends inwardly of the vertical wall means below the top thereof for cooperation with gasket stripping that extends along the sides of the cover sections and the ends thereof that are adjacent the respective ends of the opening.

Accordingly, the present invention has for an object to provide what can be termed a low level seal for the periphery of a flush-type hatch cover arrangement which incorporates a plurality of hatch cover sections.

Specifically, the invention has for an object to provide a flush-type hatch cover arrangement which includes in combination with vertical wall means delimiting a hatch opening, a horizontally disposed ledge extending inwardly from the sides and ends of the opening, this ledge being located at a depth below the top of the opening that is coordinated with the vertical dimensions of the hatch cover and the supporting wheels therefor such that in cover closing relation, the tops of the hatch cover sections lie either flush with the deck or flush with the top of the opening, and in which a compression bar is carried by the ledge and extends completely around the same and gasket stripping means are carried by the peripheral parts of the cover sections that overlie the ledge when the sections are closed, and in addition, transverse sealing means extend between the adjacent ends of the respective sections so as to provide a complete seal for the opening.

It is a still further specific object of the invention to provide a flush hatch cover relationship which includes in combination with vertical wall means delimiting an opening, a horizontal ledge extending along the sides and ends of the opening below the top thereof and inwardly of said vertical wall means, at least two pairs of hatch

cover sections, hinges connecting the respective outermost sections of each pair to the adjacent ends of the opening, intermediate hinges connecting the sections of the respective pairs together, whereby the pairs move from a horizontally closed position to a vertically open position and vice versa, gasket stripping carried by the sides of each section and the ends of each end section that are respectively adjacent the opposite ends of the opening, a continuous metal compression bar on the upper surface of the ledge for cooperation with said gasket stripping, additional gasket stripping and cooperating metallic compression bar means extending across the ends of the sections that are adjacent one another when the sections are closed, the gasket stripping extending along the sides of the sections projecting beyond the inner end of each section and meeting in abutting relation when the sections are closed, the gasket stripping that extends transversely of the opening overlying and being in sealing engagement with the projecting portions of the side gasket stripping on the respective covers, and the metal compression bar means extending transverse to the opening overlying and being in sealing engagement with the projecting portions of the side gasket stripping on the respective covers, and the metal compression bar means extending transverse to the opening overlying and being in sealing engagement with the projecting portions of the side gasket stripping on the respective covers.

Further and more specific objects will be apparent from the accompanying drawings in which:

FIGURE 1 is a diagrammatic top plan view of a hatch cover arrangement including two pairs of articulating cover sections,

FIGURE 2 is a diagrammatic vertical sectional view taken along line 2—2 of FIGURE 1 and illustrating in dotted lines one pair of cover sections in fully open position and the other pair in an intermediate position between closed and open,

FIGURE 3 is a vertical cross-sectional view on an enlarged scale taken along line 3—3 of FIGURE 1, and with parts broken away,

FIGURE 4 is a fragmentary view on an enlarged scale illustrating one edge of one cover section along the viewing line 4—4 of FIGURE 1 and showing the wheel supporting track and drain means,

FIGURE 5 is a similar view illustrating only the adjacent edge of the adjacent cover section as viewed along the viewing line of 5—5 of FIGURE 1, and

FIGURE 6 is a fragmentary view partly in side elevation and partly in section illustrating the adjacent ends of the center cover sections with the side plates removed and the sections spaced apart.

The invention as illustrated in the drawings includes a hatchway opening formed by vertical wall means VW that is adapted to be closed by four cover sections 1, 2, 3 and 4. Cover sections 1 and 2 are pivotally connected together by hinge means 5 and similar hinge means pivotally interconnect cover sections 3 and 4. The outermost sections of the respective pairs, namely, sections 1 and 4 are pivoted to the adjacent deck structure by hinge arms 6. The opening and closing movements of the illustrated hatch cover arrangement can be effected either by suitable conventional winch means, as is known in the art, or by various mechanical or hydraulic hatch cover moving mechanisms.

Extending inwardly from the vertical wall means VW is a horizontal ledge means L. This ledge means extends completely around the opening and has on its upper surface near the inner edge thereof a compression bar 7. This bar may be either a half-round welded to the upper surface of the ledge L or it can be a metal strip extending above the ledge. The corners of the compression bar are beveled so that there is provided a continuous metal

surface lying in a common plane completely around the interior of the opening and above the level of the ledge. The portions of the ledge L that extend along the sides of the opening are wide enough to be surmounted by an inclined track means T, laterally outwards of the compression bar so as to permit the cover wheels W to descend to a level sufficient to effect a seal between the compression bar 7 and the gasket stripping 8 carried at the lower end of the side and end walls of the respective cover sections and inwards of said walls. These gasket strips 8 are replaceably held in place by angle irons 9 fastened to a gasket strip accommodating housing 10 by bolt means 11. If the compression bar is a half-round, the ledge L along the sides of the opening can be level at the central portion and cut out to accommodate the wheels and suitable jacking means such as disclosed in my prior application, Serial No. 449,368 or similar jacks can be utilized to jack up the wheels to the level of the ledge prior to moving the cover sections to open position via short inclined tracks adjacent the ends of the opening.

Between the respective sections of each pair and between the sections 2 and 3 there is a transverse seal which can be of the type shown in the drawings and which includes a compression bar 12 carried by the end wall 13 of cover section 3 that cooperates with a gasket strip 14 carried by the end wall of cover section 2. The gasket strip 14 is exchangeably held in place by angle-shaped fastening strip 16 fastened to the end wall 15 by bolt and nut means 17. Both the compression bar 12 and the gasket stripping 14 include vertical portions which, as shown in FIGURE 6, will cooperate when the sections 2 and 3 are brought together to provide a complete seal across the center joint between the cover sections 2 and 3. Thus, compression bar 12 extends beyond the axial extent of the gasket strip 8 that extends along the lower edge of cover section 2. Thus, when the sections 2 and 3 are brought together and tightened by suitable dogging means such as described and shown in my prior application, Serial No. 449,368, the vertical portions of compression bar 12 will seal against the facing vertical portion of gasket strip 14 and the butt ends of gasket strip 8 carried by cover section 2 and 3 will be forced together beneath the projecting portion of the undersurface of compression bar 12 and abut against the end of gasket strip 8 carried by cover section 3. Alternatively, the sealing relationship can be the same as disclosed and claimed in my prior filed application, Serial No. 506,274 filed May 5, 1955, and entitled "Hatch Cover Constructions."

The joint extending transversely of the opening between cover sections 1 and 2 and cover sections 3 and 4 is the same structure. In other words, between the adjacent end walls of adjacent sections is a similar transverse seal. The metal compression bar being carried by cover section 3 and the gasket stripping being carried by cover section 2 at the center joint. The metal compression bar is carried by the end wall of cover section 4 and the gasket stripping is carried by the adjacent end wall of cover section 3. A similar relationship exists between the mutually adjacent end walls of cover sections 1 and 2.

The invention is not to be limited to the precise center joint and intermediate joint seal structure shown in the drawing, since the transverse seal joint could be arranged at a different level relative to the vertical dimensions of the end walls of the cover sections and be of the type shown in my prior Patents 2,869,501 and 2,869,502 dated January 20, 1959.

The present invention, therefore, is directed to the provision of a combined peripheral and transerve seal between the hatch opening and the cover sections in which the peripheral seal is at a level below the top of the opening such that when the covers are closed, the tops of the covers are substantially flush with the opening. It will be

necessary to provide drainage means such as at DM around the periphery of the opening to drain the space between the interior of the wall VW and the facing surfaces of the side and end walls of cover sections.

While the invention has been illustrated with respect to an arrangement in which a compression bar extends upwardly from the ledge around the interior of the opening, the invention is not to be limited to this precise relationship. If a flush, low level seal is desired an alternative form would include a gasketing carried by the bottom flange of each cover section for sealing engagement directly on the ledge. While the gasketing is shown as being on the interior of the side walls of the cover section and held in by the single pieces 9, where the compression bar is eliminated the gasket strip is of T-shaped cross section and includes a projecting portion that extends beyond the facing inner edges of the respective angle retainers 9 for seating against the top surface of the ledge. Therefore, the invention contemplates gasket stripping carried by the vertical and end walls of the sections for sealing engagement relative to the ledge means to provide a peripheral seal. This sealing engagement can either be directly against the ledge or directly against a compression bar carried by the ledge.

If for any reason it is desired to provide a continuous seal without the use of the gasket retainers, a gasket stripping of rectangular cross section could be bonded directly to the bottom flange of the cover for sealing against the upper surface of the ledge.

Likewise, the invention is not to be limited to relationships in which the gasket stripping is on the interior of the side and end walls of the cover sections, since the housing and angle members that retain the gasket stripping could be on the outside of the side and end walls or directly beneath the side and end walls.

The invention is also not to be limited to the precise gasket to compression bar transverse seal, since any transverse seal between the respective sections that includes end portions that cooperate with the peripheral seal can be utilized, for instance, gasket to gasket transverse seals.

What is claimed is:

1. In a hatch cover arrangement including vertical wall means delimiting a hatch opening and at least two cover sections for closing the opening, means mounting the sections for folding movement relative to the opening for exposing and closing the same, a ledge means extending laterally inwards of said vertical wall means and completely around the interior of the opening, the ledge means extending along the sides of the opening having sufficient width to provide a rolling space between the sections and the adjacent vertical wall means each cover section including vertical side and end walls and a top including a projecting portion extending laterally of the side walls of each section so as to overlie said rolling space, wheels by and on the exterior of at least one section for rolling on said ledge means, gasket stripping carried by the vertical side and end walls of the sections that overlie said ledge means for sealing engagement relative to said ledge means to provide a peripheral seal, inclined track means surmounting the ledge means outwardly of said gasket stripping and in said rolling space on which said wheels may roll, the level of said ledge means being so coordinated with the vertical extent of the side and end walls of the sections and the vertical extent of the gasket stripping that the tops of the sections are flush with the top of said vertical wall means, and a transverse seal between the sections including a compression bar and a cooperable gasket stripping carried by the respectively adjacent end walls of the respective sections at a level adjacent said ledge means.

2. A hatch cover arrangement as claimed in claim 1, in which the gasket stripping carried by the vertical side walls of the cover sections is disposed on the interior of the sections at the lower ends of said walls.

3. A hatch cover arrangement as claimed in claim 2

and oppositely facing angle shaped means removably connected to the side walls of the cover sections, each including a web portion underlying a portion of the undersurface of the gasket stripping for exchangeably supporting and retaining said gasket stripping in place.

4. In a hatch cover arrangement including vertical wall means delimiting a hatch opening and terminating in a top, two pairs of cover sections each having vertical side and end walls, means pivotally connecting the sections of each pair together, hinge means connecting one section of one pair for swinging movement relative to one end of the opening, hinge means pivotally connecting the remote section of the other pair for swinging movement relative to the other end of the opening whereby the covers can be jackknifed to open and closed position relative to the opening, ledge means extending laterally inwards of the vertical wall means and completely around the interior of the opening, said ledge means being located at a level below the top of the opening so coordinated with the vertical extent of the side and end walls of the sections that the tops of the sections lie flush with the top of the opening of the vertical wall means when the sections are in closed condition, the ledge means extending along the sides of the opening having sufficient width to accommodate a rolling space between the side walls of the sections and the vertical means delimiting the opening, wheels carried by at least one section of each pair for supporting the same for rolling movement relative to said ledge means between cover open and closed conditions, inclined track means surmounting the ledge means directly adjacent the vertical means delimiting the opening and extending downwardly from opposite ends of the opening and in said rolling space on which said wheels may roll, gasket stripping carried by the lower ends of the vertical side and end walls that overlie the ledge means for sealing engagement relative to said ledge means to provide a peripheral seal and a transverse seal between the end walls of the respective sections of each pair and the end walls of the end sections of each pair including cooperating compression bar and gasket stripping means carried by the respectively mutually adjacent end walls of the sections and having end portions in sealing engagement with the gasket stripping carried by the side walls of the respective sections at a level adjacent said ledge means.

5. In a hatch cover arrangement including vertical wall means delimiting a hatch opening and terminating in a top, two pairs of cover sections each having vertical side and end walls, means pivotally connecting the sections of each pair together, hinge means connecting one section of one pair for swinging movement relative to one end of the opening, hinge means pivotally connecting the remote section of the other pair for swinging movement relative to the other end of the opening whereby the covers can be jackknifed to open and closed position relative to the opening, ledge means extending laterally inwards of the vertical wall means and completely around the interior of the opening, said ledge means being located at a level below the top of the opening so coordinated with the vertical extent of the side and end walls of the sections that the tops of the sections lie flush with the top of the opening of the vertical wall means when the sections are in closed condition, the ledge means extending along the sides of the opening having sufficient width to accommodate a rolling space between the side walls of the sections and the vertical means delimiting the opening, wheels carried by at least one section of each pair for supporting the same for rolling movement relative to said ledge means between cover open and closed conditions, a compression bar on the upper surface of the ledge means adjacent the inner edge thereof and extending completely around the opening, inclined track means surmounting the ledge means outwardly of said compression bar and in said rolling space on which said wheels may roll, gasket stripping carried by the lower ends of the vertical side and end walls that overlie the ledge means for sealing engagement with said compression bar means to provide a peripheral seal and a transverse seal between the end walls of the respective sections of each pair and the end walls of the end sections of each pair including cooperating compression bar and gasket stripping means carried by the respectively mutually adjacent end walls of the sections and having end portions in sealing engagement with the gasket stripping carried by the side walls of the respective sections at a level adjacent said ledge means.

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