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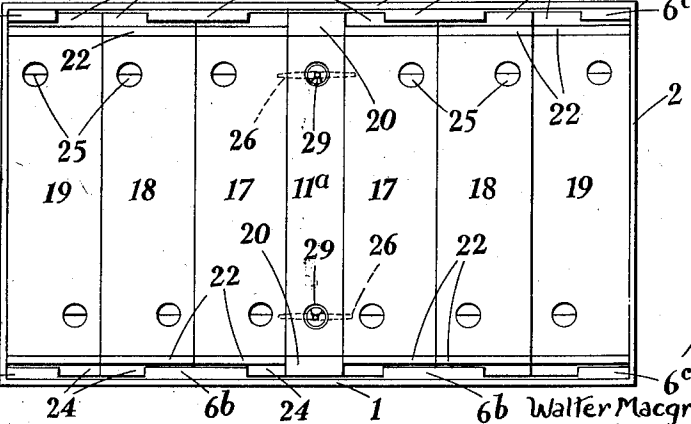
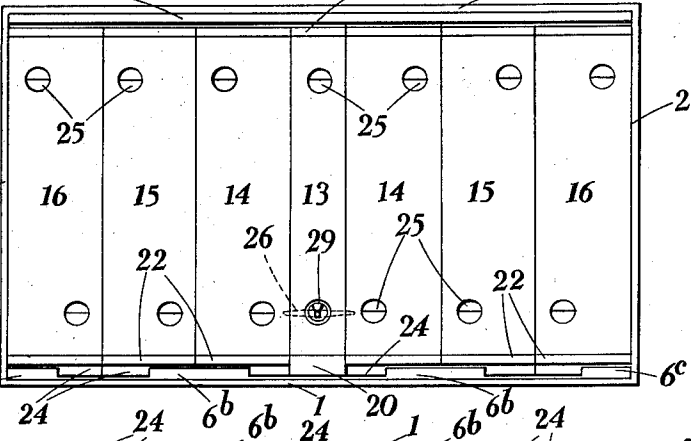
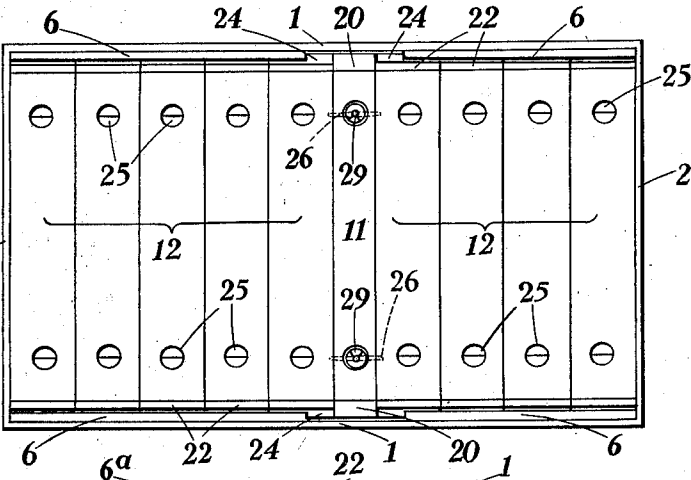
W. M. YORKE

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SHIP'S HATCH

Filed March 16, 1936

2 Sheets-Sheet 1



INVENTOR

Walter Macgregor Yorke

BY

John Thompson
ATTORNEY

ATTORNEY

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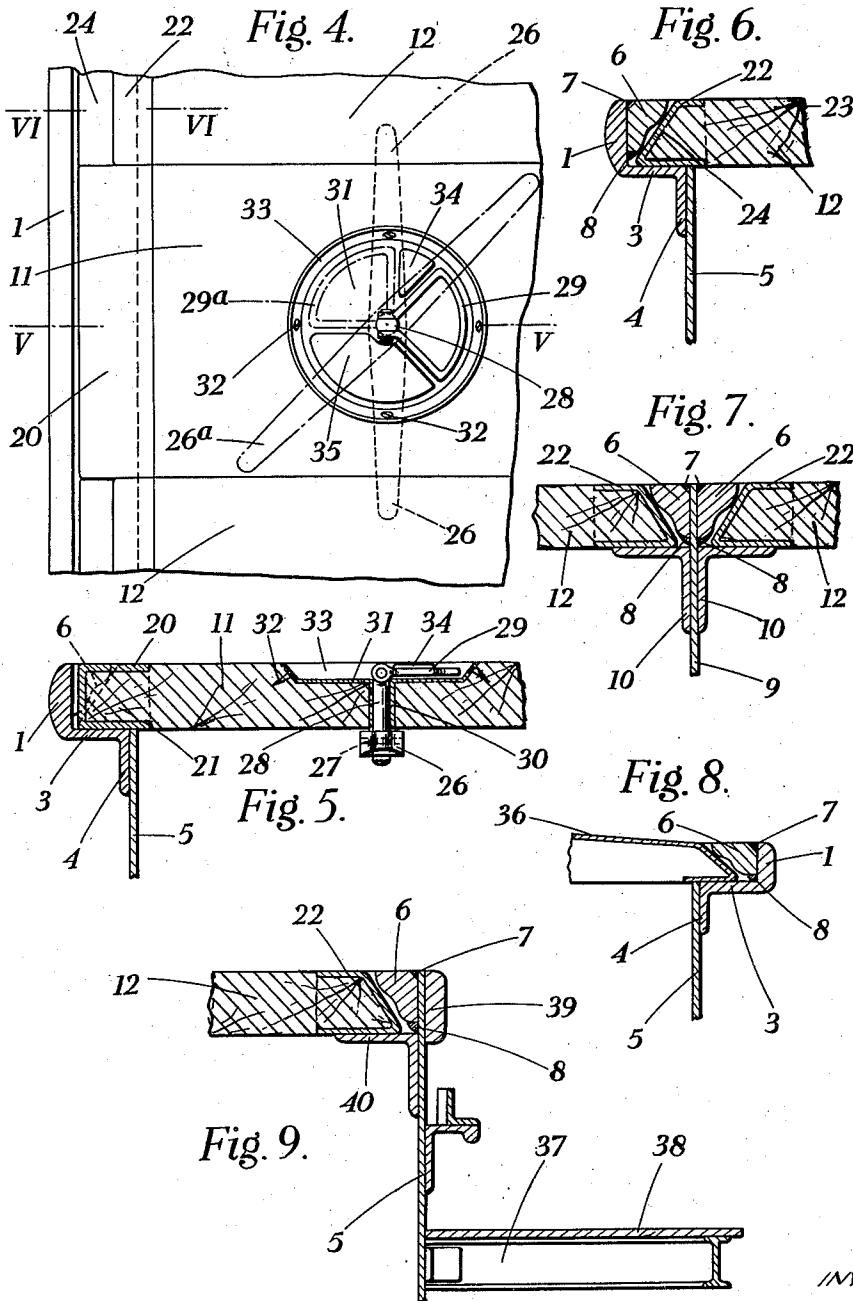
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INVENTOR
Walter Macgregor Yorke,
BY
John Thompson
ATTORNEY

UNITED STATES PATENT OFFICE

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SHIP'S HATCH

Walter Macgregor Yorke, Llandaff, Wales

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3 Claims. (Cl. 114—201)

This invention relates to ships' hatches of the kind comprising a hatch structure which receives and supports a plurality of hatch covers, which may be planks or metal box-like sections.

5 An official requirement in respect of hatches of this type is that the ends of wooden covers shall be supported for a length equal to their thickness, but in any case for not less than $2\frac{1}{2}$ " at each end. It is further usual to provide on the hatch coamings and the removable beams (if any) which support cover ends, upstanding webs serving to prevent endwise displacement of the covers. There is, however, no requirement regarding the securing of the covers against lateral or vertical dislodgment, the Board of Trade recommending that the covers be secured by wire rope lashings over the tarpaulins. This arrangement is a source of worry and is very unpopular with ships' officers, since if the lashings are made tight enough to hold the covers down under the stresses to which they are subjected in heavy weather at sea, they damage and rapidly destroy the tarpaulins. Steel bars which have sometimes been substituted for the aforesaid wire lashings are subject to the same objection. It is therefore common practice to leave the covers unsecured except by the tarpaulins which are stretched over them.

30 A frequent result of the aforesaid arrangement is that in rough weather one end of a cover is jerked upwards sufficiently to ride on the web of the coaming or beam, whereafter there is nothing to prevent it from moving endwise and dropping its other end into the hold, which is thereafter unprotected from the ingress of heavy masses of water.

40 Proposals have been made with the object of providing a hatch structure wherein dislodgment of the covers is prevented not only endwise and laterally, but also vertically, so that there is no possibility of the hatch closure being broken or disturbed during the heaviest weather.

Inter alia, it has been proposed to provide, in association with the rest irons, beams or other supports for the ends of the hatch covers, retaining means constituted by angle iron sections under which said ends are laterally slidable and which serve to prevent endwise and vertical dislodgment of the covers, the sections being interrupted at the middle or the sides of the hatch by not less than the breadth of a cover to permit application and removal of the covers.

55 According to the invention, the retaining means comprises inwardly projecting solid wedge section shoulders secured base uppermost to the up-

standing webs of the supports so that chamfered cover ends are slidable under them, at least one of each opposing pair of shoulders being interrupted for not less than the breadth of one cover. Such retaining means are capable of withstanding heavy wear and tear by impact of the covers or of grabs, tubs, and other gear used in loading or unloading cargo. In a modification, the retaining means may comprise a plurality of shoulder elements secured to the upstanding web of a support at such intervals that each element overhangs the end of one cover or the ends of two adjacent covers, and a similar plurality of shoulder elements, or a continuous shoulder, secured to the upstanding web of the opposite support.

The retaining means aforesaid are preferably constituted by shoulders or shoulder elements having a wedge section or ogee section, welded base uppermost to the upstanding webs of the supports so as to overhang chamfered ends of covers resting on the supports.

The invention also extends to a ship's hatch closure comprising retaining means constituted by solid wedge section or ogee section shoulders secured base uppermost to each opposite pair of rest irons, beams or other supports for the ends of the hatch covers, at least one of each opposing pair of shoulders being interrupted for not less than the breadth of one cover, fixed abutments engaging the outer sides of the marginal covers, a plurality of covers having chamfered ends laterally slidable on said supports and below said retaining means whereby said covers are prevented from endwise and vertical dislodgment and a finally applicable cover having means actuable to lock it against endwise and vertical dislodgment to the adjacent covers on both sides, or to the adjacent cover on one side and the marginal abutment on the other side. In a hatch closure as aforesaid the locking means of the finally applicable cover may comprise, for example, a turnbuckle which is only disengageable, or a pair of laterally projecting bolts which are automatically retractable, on the lifting of a ring serving for the raising of the cover.

The covers, when made of wood, preferably have their ends enclosed in metal box-like shods or shoes, hereinafter referred to as shoes.

Some hatch closures according to the invention will be described, by way of example, with reference to the accompanying drawings wherein:—

Figs. 1, 2, and 3 are plan views of different hatch closures according to the invention;

Fig. 4 is a plan view of a detail on a larger scale;

Fig. 5 is a vertical cross section on the line V—V of Fig. 4;

Fig. 6 is a cross section on the line VI—VI of Fig. 4;

Fig. 7 is a similar cross section of another detail, and

Figs. 8 and 9 are similar cross sections of two variations.

The hatch closure shown in Fig. 1 includes end coamings 1 and side coamings 2 constituting a rectangular hatch. The end coamings 1 are constituted (as clearly shown in Fig. 6) by up-
standing webs of rolled section members which
comprise a horizontal portion 3 serving as a support or rest for the ends of the covers and are
attached by means of a dependent web 4 to the vertical walls 5 of the hatch. Inside each of
the end coamings 1 are secured two shoulders 6
of ogee section, separated adjacent the middle of the hatch by a substantial gap. The upper edge
of each shoulder adjacent the coaming 1 is bevelled to facilitate the securing of the section by
a seam weld 7. Further, at intervals along their length the sections are secured at their lower
edges by spot welds 8.

The closure shown in Fig. 1 has a set of covers comprising a half-breadth locking cover 11 and a plurality of single plank covers 12, the combined width of the cover 11 and one of the covers 12 being substantially equal to the widths of the gaps between the shoulders 6. The cover 11 is provided at each end with a cuboid metal shoe 20 secured over the reduced end 21 of the cover as shown in Fig. 5 and the covers 12 are provided at both ends with shoes 22 of trapezoidal section similarly secured over the reduced ends 23 of the covers, so that the end surfaces 24 are inclined, as shown in Fig. 6.

When the hatch is to be closed, the covers 12, which are transportable by means of handles 25, are lowered so that their ends pass through the gaps between the shoulders 6, until the shoes 22 rest upon the horizontal surfaces 3 of the end coamings or rest irons. Each cover 12 is then slid laterally to one side or the other of the hatch, its ends passing under the shoulders 6, with which they contact at two points, as shown in Fig. 6, and being thereby secured against endwise and vertical displacement. When all the nine covers 12 have been inserted and slid under the shoulders 6, a gap is left for the insertion of the locking cover 11, which is dropped into this gap. The covers 12 are thus retained laterally between the side coamings 2 and prevented from dislodgment in any direction.

The locking cover 11 is maintained against endwise dislodgment by the coamings 1 and against lateral dislodgment by the adjacent covers 12; locking means are further provided for preventing vertical dislodgment, as shown more clearly in Figs. 4 and 5. These locking means comprise a turnbuckle 26 disposed adjacent each end of the cover 11 for rotation to a transverse position wherein each of its ends extends below the adjacent cover 12. Since the covers 12 are held down by the shoulders 6, they, in turn, by engagement with the ends of the turnbuckle 26, hold down the cover 11. The turnbuckle is secured rigidly by a pin 27 to a bolt 28, having transversely pivoted at its upper end a lifting handle 29. The bolt 28 passes through a tube 30 joined at its upper end to a dished plate 31 which is secured in a circular recess in the cover 11 by

means of wood screws 32 passed through holes in the inclined peripheral flange 33 of the plate. The plate comprises lands 34 and 35 serving to locate the handle 29 when this is turned horizontally, the disposition of these lands being such that when the handle lies between them, as shown in full lines in Fig. 4, the ends of the turnbuckle 26 are held below the adjacent covers 12 and the turnbuckle is prevented from rotating.

For opening the hatch it is first necessary to remove the locking cover 11. Upon the lifting of the handle 29, this is automatically freed for rotation and it can be turned to disengage the ends of the turnbuckle 26 from below the adjacent covers 12. The cover 11 can thereupon be lifted and removed. To hold the turnbuckle below the cover while this is removed from the hatch, the handle may be dropped between the lands 34 and 35 in the position 29a (Fig. 4), the turnbuckle then being in the position 26a.

The gaps between the shoulders 6 at both ends of the hatch are of such width that after removal of the cover 11, the cover 12 on either side may be slid laterally until its ends are below the gaps, whereafter it may be lifted vertically by means of its handles 25 and removed. Thereafter each of the remaining covers 12 may be slid laterally on the rest irons until its ends are below the said gaps and similarly lifted for removal.

The modified closure shown in Fig. 2 includes a single plank locking cover 13, and the remaining covers 14, 15 and 16 are of double width. One of the end coamings has a continuous shoulder 6a of ogee section while the other coaming 1 has a plurality of shoulder elements 6b and 6c. The locking cover 13 has one cuboid shoe 20 located in the gap between the shoulder portions 6b and a bevel shoe 22 at the other end for engagement below the continuous shoulder 6a. The cover 13 further has locking means, as above described, adjacent its end which is provided with the cuboid shoe 20. The covers 14, 15 and 16 have at each end shoes 22 presenting inclined faces 24 engageable on the one hand by the continuous shoulder 6a and on the other hand by the shoulder portions 6b and 6c.

The locking cover 13 is removable as above described by first lifting the end thereof provided with the cuboid shoe 20 and then moving the cover endwise so that its shoe 22 disengages from below the shoulder 6a. Either of the covers 14 may then be slid sideways until one of its ends is disposed below the gap between the shoulder portions 6b. This gap is equal to the combined width of the cover 13 and one of the covers 14, so that one end of the cover which is so slid inwards can be lifted up through the gap and the cover displaced endwise until its other end disengages from below the shoulder 6a. After removal of the first cover 14 the opening of the hatch may proceed in several ways. The cover 15 on the same side may be moved to a position wherein its end is below the shoulder element 6b, so that the adjacent cover 16 may be displaced by sliding it and lifting its end through the gap between the shoulder elements 6b and 6c, which is of the same width as any of the covers 14, 15, 16. Thereafter, the cover 15 may again be slid outwards and removed by lifting of its end through the same gap. Alternatively, the cover 15 may be slid inwards and removed by lifting its end through the middle gap between the elements 6b. Either procedure may likewise be adopted for removing the covers 14, 15 and 16 at the other side of the hatch.

In the modification shown in Fig. 3, the end coamings 1 are both provided with shoulder elements 6b and 6c engaging the inclined faces 24 of shoes 22 on the ends of double width covers 17, 18 and 19. Each of the elements 6b overlaps substantially half the breadth of two covers 17 and 18 and between the two elements 6b on both sides are gaps equal to the combined width of a double breadth cover and a central locking cover 11a. Each of the shoulder elements 6c overlaps about half the breadth of a marginal cover 19 and between it and the adjacent shoulder element 6b is a gap equal to the cover breadth. The locking cover 11a has cuboid shoes 20 at both ends, and turnbuckles 26 adjacent its ends, as above described. For opening the hatch, the cover 11a is first unlocked by rotation of its turnbuckles, and then lifted vertically. Thereafter the covers 17, 18 and 19 may be removed by sliding along the rest irons, until their ends are located in an opposite pair of gaps, and lifting, in various sequences, as will be evident from the foregoing description.

Fig. 7 shows a construction of a removable intermediate beam utilizable where a hatch is closed by means of two series of covers. It will be appreciated that this beam takes the place of one of the end coamings 1 as shown in any of Figs. 1 to 3 and supports the ends of a series of covers on each side. The central web 9 of the beam is provided in known manner with an angle iron 10 on each side to serve as a rest for the shoes 22 of the covers, and is further provided according to the invention on each side with a shoulder member or members 6 secured by a seam weld 7 and a series of spot welds 8. Evidently, the beam may have on each side shoulder elements 6 extending from the sides of the hatch with a single gap at the middle as shown in Fig. 1, a continuous shoulder member 6a as shown in Fig. 2, or shoulder portions 6b and 6c as shown in Fig. 3.

It will be observed from Figs. 5, 6 and 7 that the shoes 20 and 22 are of such length as to overhang the inner edges of their supports, namely, in Figs. 5 and 6 the horizontal surfaces of the webs 3 and the upper ends of the hatch walls 5, and in Fig. 7 the horizontal webs of the angle irons 10. This avoids a weakness of the covers to shearing at said edges under impact of heavy masses of water.

A further modification is shown in Fig. 8. The hatch structure is similar in every respect to those above described except that the ogee section shoulder 6 is of greater depth than height to co-operate with box-like metal hatch covers 36, which may be of less thickness in relation to their length than wooden covers.

It will be appreciated that the arrangement of the shoulders or shoulder elements 6, 6a, 6b, 6c is purely arbitrary, and that a greater or less number of gaps may be provided as considered desirable.

In the modification shown in Fig. 9, the rest for the covers 12 is constituted by an angle iron 40 secured inside the wall 5 of the hatch, which is supported on the deck beams 37 located below deck plating 38. The ogee section shoulders 6 are secured, as above described, by seam weld 7 and spot welds 8, inside the upper margin of the hatch wall 5, which is externally reinforced by a rolled fillet 39. This construction employs standard rolled sections in place of the special rest iron shown in Figs. 5 and 6, while being strong and capable of resisting damage by im-

pact of water masses or loading and discharging gear.

The preferred ogee section of the retaining shoulders or shoulder elements is standard, being one which was formerly in use as a rest iron. With a bevelled upper edge as shown, it is conveniently securable by a seam weld 7, while its lower edge is well adapted for the location of a series of spot welds. Since it affords a double line contact with the inclined end faces of the covers, it is less susceptible to binding of the covers in application to or removal from the hatch, and it is capable of withstanding heavy wear and tear from grabs, tubs and other gear during loading and discharging of cargo. Further, in the event of the welds being broken accidentally, repairs may be effected by riveting through the section and its supporting web, as the rivet heads may be located in the concave portion of the section where they do not impede the lateral sliding of the cover ends. Optionally, the sections may be secured permanently by riveting in this manner, without welds.

Other retaining means may, however, be employed. For example, the shoulders or shoulder elements may be of solid wedge section. A beam supporting covers at both sides may have a double web, the upper margins of the plates being separated, above the rest irons, with intermediate reinforcement as by a metal or wooden V-section batten, or by transverse bridges, to overhang chamfered cover ends.

Further constructional modifications within the scope of the invention will be apparent to those skilled in the art.

I claim:—

1. A ship's hatch closure comprising a plurality of covers having ends each of which is bounded by an oblique plane, a rectangular structure having along two opposite sides continuous supports for the ends of said covers, vertical webs rising at the outer sides of said supports, retaining means constituted by shoulders welded base uppermost and by vertically disposed sides to the inner sides of said webs under which the cover ends are laterally slidable, the retaining means on at least one of said sides comprising a plurality of shoulder elements disposed at intervals greater than the breadth of one cover and partially overhanging the end of at least one cover, each of said shoulder elements being of ogee section and solid within the space enclosed by its base, its vertical side and a plane joining the remote edges of said base and said side, fixed abutments engaging the outer sides of the marginal covers, a finally applicable cover having one end disposable in one of said intervals and means carried by said last mentioned cover actuable to lock said end in position against vertical dislodgment.

2. A ship's hatch structure of the kind adapted to be closed by a plurality of removable covers, and having in combination rest irons extending along two opposite sides of the structure, cover rest surfaces presented by said rest irons, vertical webs rising from the outer margins of said surfaces and cover retaining means overhanging said surfaces, at least one of said retaining means being interrupted, characterized in that said cover retaining means are constituted by shoulders secured base uppermost and by vertically disposed sides to said vertical webs, each of said shoulders being of ogee section and solid within the space enclosed by its base, its vertical side and a plane joining the remote edges of said base and said side.

3. A ship's hatch closure comprising a plurality of covers having ends each of which is bounded by an oblique plane, a rectangular structure having along two opposite sides continuous supports for the ends of said covers, vertical webs rising at the outer sides of said supports, retaining means constituted by shoulder elements welded base uppermost and by vertically disposed sides to the inner sides of said webs under which the cover ends are laterally slidable, at least one of said shoulder elements having an interruption of which the breadth is not

less than that of one cover, each of said shoulder elements being of ogee section and solid within the space enclosed by its base, its vertical side and a plane joining the remote edges of said base and said side, fixed abutments engaging the outer sides of the marginal covers, a finally applicable cover having one end disposable in said interruption and means carried by said last mentioned cover actuatable to lock said end in position against vertical dislodgment.

WALTER MACGREGOR YORKE.