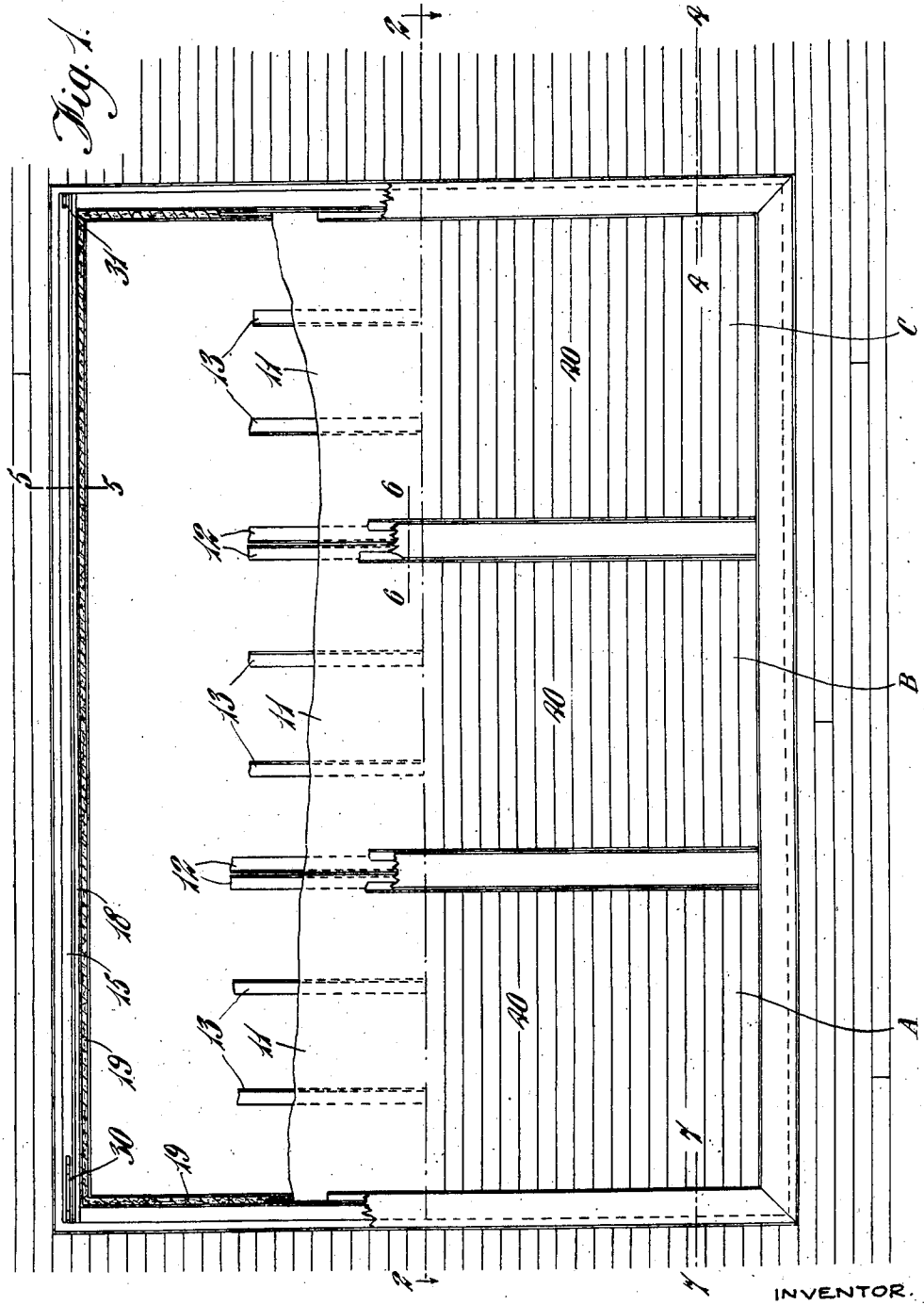
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HATCH COVER

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Fig. 1.

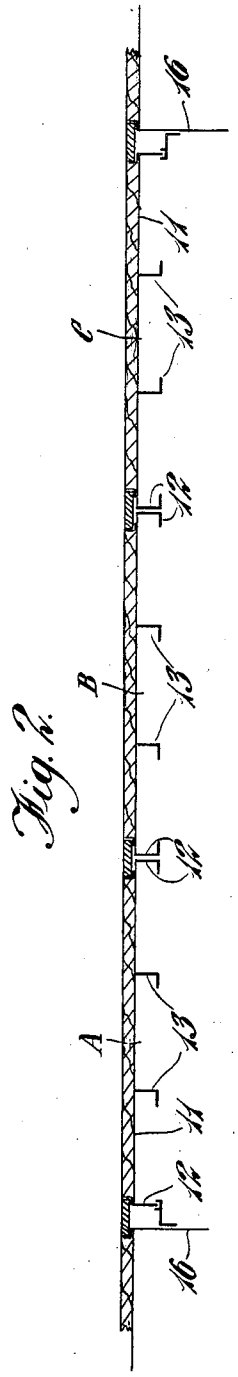


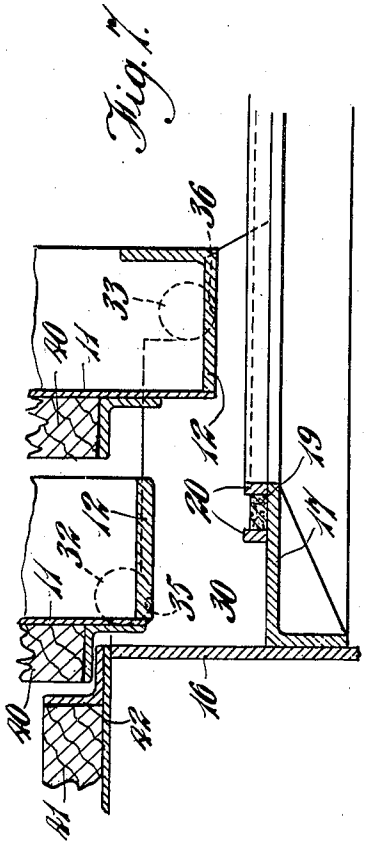

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Fig. 3.

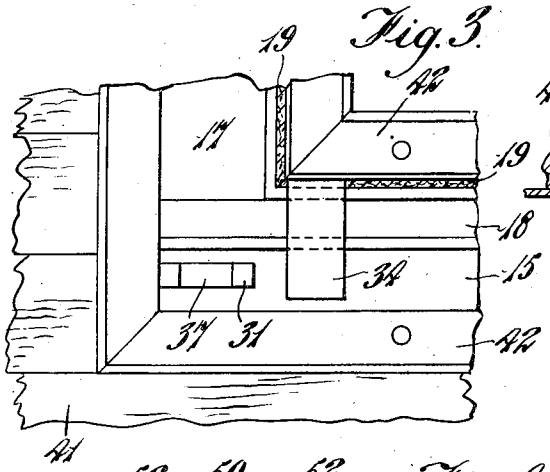



Fig. 5.

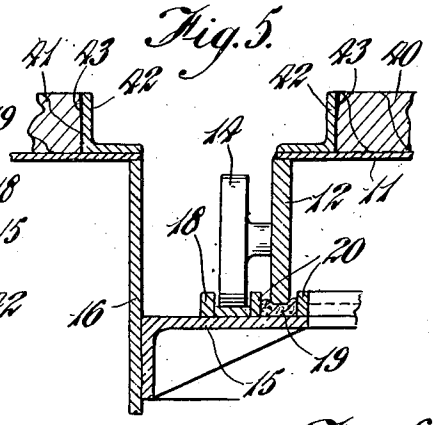



Fig. 4.

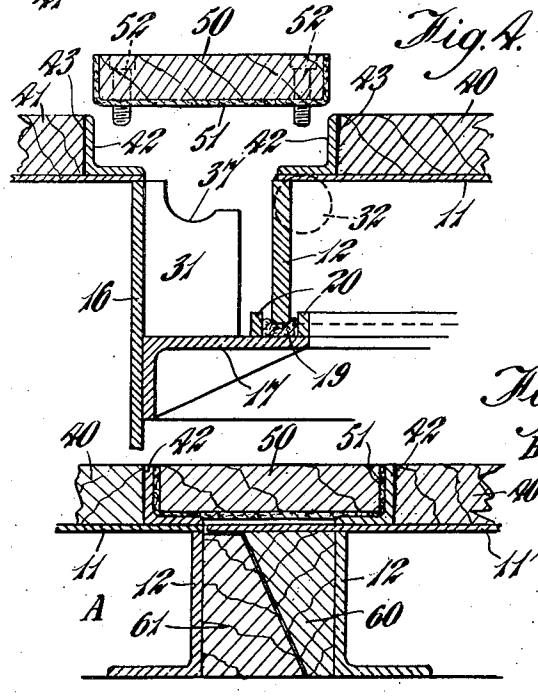



Fig. 6.

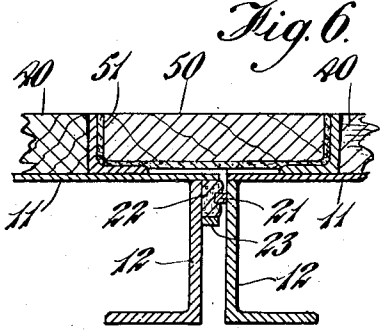



Fig. 8.




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Patented Oct. 7, 1941 2,257,776

# UNITED STATES PATENT OFFICE

2,257,776

## HATCH COVER

Charles William King, London, England, assignor to MacGregor & King Limited, London, England, a British company

Application August 31, 1939, Serial No. 292,810
In Great Britain December 12, 1936

2 Claims. (Cl. 114—202)

This invention relates to improvements in hatch covers for ships, more particularly steel hatch covers. Various constructions of steel hatch covers have been proposed heretofore but in every case, as far as I am aware, the hatch cover or the sections thereof have fitted down on to a coaming upstanding from the deck. This, of course, to a certain extent, facilitates the handling of the hatch cover sections but it has the disadvantage of breaking up the expanse of level deck. Many advantages may be secured by dispensing with the upstanding coaming, for example, a much larger expanse of deck is available for dancing, sports or for any other purpose.

The hatch cover arrangement according to the present invention is characterised in that a coaming upstanding from the deck is dispensed with and in that the steel hatch cover, or the steel hatch cover sections is or are adapted to bed down on to a suitable water-tight packing carried by appropriately mounted bulb angles or like supports at such a depth below the deck level that the upper surface of the steel hatch cover or steel hatch cover sections lies flush with the deck when the said hatch cover or hatch cover sections is or are in position to close the hatchway.

There are many ways in which the present invention may be carried into practical effect. For example, in one form the hatch cover is made in one or more steel sections which is or are supported on rollers adapted to run on bulb angles or other suitable runways disposed below the deck level, said section or sections being adapted to be run out of position and then tipped up to vertical, or substantially vertical position, in which they are clear of the hatch opening.

The rollers on which the hatch cover section or sections is or are supported are preferably of the eccentric bush type, as described and claimed in my prior British Patent No. 305,836 so that the hatch cover section or sections may be raised clear of their water-tight packing to facilitate the manipulation of the same or, alternatively, lowered on to such packings to provide a good water-tight joint.

When the hatch cover section or sections is or are tipped up outside the area of the hatch opening the lower ends of the same are preferably still located below the deck level.

The hatch cover section or sections in such a construction may be manipulated in any suitable manner, it being clearly understood that in all cases the upper surfaces of the hatch cover sections (which may be covered with deck planking of the same thickness as the normal deck planks) are, when the hatch is closed, flush with the deck level and conform with the camber of the deck.

Means are also provided to ensure a water-tight joint at the edges of the hatch and also between the sections if there be more than one.

Now obviously the provision of eccentric bush rollers at the sides of the hatch cover section or sections requires that there shall be a space of, say, six inches between the edges of the hatch cover section or sections and the edges of the hatch opening at deck level, this space being required for the manipulation of the rollers. Such a space is left according to the present invention and loose planks or other suitable coverings are provided to fill in the same and to maintain the correct even deck level when the hatch is closed. Similarly if the sections are to be run off the hatch opening and tipped up clear of the same it is likewise necessary that there shall be a space clear of the hatch opening and below the deck level in which said sections may be tipped up. Consequently, in carrying out the present invention there is provided at one or more of the sides or ends of the hatch opening a space within which the sections may be tipped up, the said space containing the necessary stepped pivoting blocks which are positioned well below the deck level. Such space when the hatch cover sections are in position is covered by removable deck planks or plates adapted to maintain the flush deck level.

In an alternative arrangement according to the present invention the hatch cover comprises a plurality of sections, the effective upper surfaces of which lie flush with the deck when said hatch cover sections are in position and one or more of said sections is or are removed by lifting the same off the coaming, one or more of the intermediate sections being provided with tapering sides so that when the same is or are lowered into position between the outer sections a wedge action is set up tending to spread the outer sections which are thus pressed hard up against their end packing.

The inner edges of the outer sections are preferably tapered to co-operate with the intermediate section or sections and, if desired, the coaming sides may also be inwardly sloped to give a better joint.

The end sections are then preferably mounted on rollers running on bulb angle or other suitable track rails mounted inside the coaming in order to impart mobility to the sections so that the

spreading may, if necessary, the more easily take place when the intermediate section is lowered into place.

In order that this invention may be the more clearly understood and readily carried into effect, I will proceed to describe the same with reference to the accompanying drawings, which illustrate by way of example and not of limitation certain convenient embodiments of this invention, and in which:

Figure 1 is a plan view of a three-section hatch cover arrangement according to the present invention showing the hatch cover sections in progressively increasing sections, and

Figure 2 is a somewhat diagrammatic section on line 2—2 of Figure 1.

Figure 3 is a plan view of one corner (the right-hand side one shown in Figure 1) on an enlarged scale with the packing or filling planks hereinafter referred to removed.

Figure 4 is a section on line 4—4 of Figure 1 on an enlarged scale showing the packing or filling plank about to be inserted in position to close the gap between the deck planking and the planking on top of the hatch cover section.

Figure 5 is a section, also on an enlarged scale, on line 5—5 of Figure 1.

Figure 6 is a section on line 6—6 of Figure 1 illustrating the method of making a water-tight joint between the abutting edges of the hatch cover sections and also showing the filling blank in position.

Figure 7 is a section on line 7—7 of Figure 1 showing two of the hatch cover sections turned up to a vertical position in order to open up the hatch.

Figure 8 is a sectional view through the centre section of a three section hatch cover according to the present invention showing a modified construction.

Referring now more particularly to Figures 1 to 7 of the accompanying drawings, the hatch cover therein illustrated comprises three sections A, B and C which, in accordance with the present invention, are adapted to cover the hatch opening 10 whilst at the same time their upper surfaces, when in position, are flush with the deck level (see Figure 2), whereby the provision of any upstanding coaming with its attendant disadvantages as pointed out above is avoided. Each section comprises a steel top plate 11, sides and ends 12 and intermediate transverse angle iron stiffeners 13. Broadly, therefore, each hatch cover section may be considered to be generally of the same construction as that described in my prior British Patent No. 305,836. The hatch cover sections are supported at each side by means of pairs of eccentric bush rollers (one of which is shown at 14, Figure 5) of the form described in the said prior patent on side runways 15 of appropriate width which may be substantially in the form of bulb angles carried by the steel hatch opening framing 16. This hatch opening framing corresponds, therefore, to the upstanding coaming which was provided in the previously proposed hatch cover arrangements, but it will be seen that whilst it has all the desirable attributes of an upstanding coaming, yet nevertheless it extends essentially below the deck level and not above the same so that the disadvantages of the old upstanding coamings are avoided. In addition to the side runways 15, the hatch opening framing 16 is provided at its ends with similar bulb angles or like parts 17 which do not, however, serve as runways for the eccentric bush or like rollers 14. The side runways 15 are also provided with wheel guides 18 of angle form which serve to prevent undue skewing of the hatch cover sections as they are rolled along the runways.

All around the edge of the hatch cover opening is provided with resilient packing 19 which is held in position on the side runways 15 and the end bulb angles or the like 17 between pairs of strips 20 welded to the parts in question.

The side runways 15 and the end bulb angles or the like 17 are mounted at such a position on the hatch opening framing 16 that when the hatch cover sections A, B and C are seated down on to the packing 19 to give a water-tight joint due to manipulation of the eccentric bush rollers 14, the upper surfaces of the hatch cover sections (or any planking thereon) will be flush with the deck level. When it is desired to open up the hatch the eccentric bush rollers 14 are manipulated in the manner described in the prior British patent above mentioned to raise the sections clear of the packing 19 whereupon they may be readily run along the runways 15.

In order to secure a water-tight joint between two abutting ends of the hatch cover sections, one of the sections (see Figure 6) is provided with a transverse metal strip 21 of an appropriate size which is adapted to co-operate with and sink into a transverse resilient packing strip 22 held in position on the juxtaposed end of the adjacent section between metal strips 23.

Any suitable method of stowing the hatch cover sections when it is desired to open up the hatchway may be provided without departing from the scope of the present invention. In the arrangement shown in Figures 1 to 7 of the drawings two of the hatch cover sections (A and B) are adapted to be tipped up vertically at one end of the hatchway whilst the third hatch cover section is adapted to be tipped up vertically at the other end of the hatchway. In order to accomplish this, the side runways 15 are provided at each end with trunnion plates 30 and 31, the trunnion plates 30 at the left-hand end of Figure 1 being double and of stepped formation (see Figure 7) since it is at this end that the two sections are to be tipped up. The trunnion plates 31 at the opposite ends of the runways need only be adapted, in this construction, to deal with a single hatch cover section (C) as shown more clearly in Figure 4. The hatch cover sections are provided with trunnion pins 32, 33 and 34 respectively, the pins 32 and 34 of the end sections A and C being disposed at the top of the sections in question, whilst the pin 33 on the centre section is stepped down for a purpose hereinafter explained.

In opening up the hatchway the eccentric bush rollers of all of the hatch cover sections are manipulated to raise the hatch cover sections clear of the packing 19 and also of the packing retaining strips 20. The section A is then run off until its trunnion pins 32 engage in the upper bearings 35 of the trunnion plates 30 whereupon it is turned up to the vertical position shown in Figure 7 by means of a winch or any other suitable means. The section B is then run off along the side runways 15 until its stepped down trunnion pins 33 engage with the lower bearings 36 of the trunnion plates 30 whereupon the same is tipped up in the same way as the section A by means of the winch or other suitable means.

The section C is manipulated in a like manner to the section A, being run off along the side runways 15 until its trunnion pins 34 engage

with the bearings 37 in the trunnion plates 31 (see Figure 4) whereupon the same is tipped up to a vertical position.

It will be seen that with the construction illustrated in the drawings the centre section B does overhang the hatch opening when tilted up to its vertical position. If this should be considered to be a disadvantage it is only necessary to increase the width of the bulb angle or the like 17 at this end.

Now it will be readily appreciated that whilst the omission of an upstanding coaming and the substitution therefor of the hatch opening framing 16 extending below the deck level with its associated side runways 15 and end bulb angles or the like 17 will effectively prevent any projections above the deck level, it will not automatically ensure that an unbroken deck level is secured. In the first place, the provision of the eccentric bush rollers 14 at the sides of the hatch cover sections will require that a space of at least four to six inches shall be left for the effective manipulation of the same and, secondly, the tipping up of the hatch cover sections to the vertical position hereinbefore referred to necessitates the provision of a free space between the ends of the cover sections and the surrounding deck within which this tipping up may take place. Such spaces are accordingly left according to the present invention and when the hatch cover sections are in position are filled in by filling planks.

When it is desired that an unbroken planked deck space shall be provided the upper surfaces of the steel hatch cover sections are provided with planking 40 identical or similar to the main deck planks 41, the arrangement being such, as above explained, that the planks 40 lie flush with the planks 41.

In carrying out the present invention in the form illustrated in Figures 1 to 7, the deck planking 41 does not extend up to the hatch opening framing 16 nor does the plank covering 40 of the hatch cover sections extend to the edges thereof. In all cases the planking extends only up to a steel caulking angle 42 which is set back from the edge in question as shown in the drawings. The planking is caulked as at 43 to make it water-tight. There is thus left in the deck surface spaces all around the hatch and also between the sections thereof.

Such spaces are, in accordance with the present invention filled in with filling planks 50, the bottoms and sides of which are lined with feltings 51 to give a good water-tight joint. These filling strips when the hatch is closed are held in position by means of sunk screws 52 screwing into the caulking angles 42 and the underneath parts of the structure (see Figure 4). In opening up the hatch it is, therefore, first necessary to remove the filling planks 50 by slackening off the screws 52 to give access to the eccentric bush wheels 14.

In the modification illustrated in Figure 8 the two outer sections of the hatch cover are substantially the same as in the construction described above, but the centre section $B^1$ is not provided with rollers. Its ends are provided with wooden or other suitable jointings 60 which are bevelled off to co-operate with corresponding oppositely bevelled off jointings 61 on the two outer sections A and C. The centre section $B^1$ is adapted to be lifted off vertically from between the sections A and C when it is desired to open up the hatchway and to be replaced by like means when it is desired to close the same. By this means when the centre section is lowered into position the two outer sections A and C are forced apart, due to the wedge action which is set up between the parts 60 and 61, hard up against the end packing. The packing for the sections is arranged in any suitable manner to give the desired water-tightness and, if desired, the hatch opening framing 16 itself may be inwardly sloped to co-operate with a similar slope on the outer edges of the end sections. The other usual accessories such as cleats and so forth are, of course, provided, these being arranged in any suitable manner.

Many modifications may be provided in the above described embodiment without departing from the scope of the present invention, for example, the hatch cover may comprise more than three sections.

In addition to being useful where it is desired to secure an unbroken surface, the hatch cover arrangements according to the present invention are also very useful in confined spaces such, for example, as at the bottom of a trunk hatch where the necessity of providing as large an opening as possible prevents the hatch cover sections being rolled off to the ends or sides as in my prior patents.

I claim:

1. A multi-section steel hatch cover arrangement for hatchways on decks and the like comprising a plurality of spaced steel hatch cover sections each having an upper surface, members for supporting said sections and arranged spacedly from the level of said deck and the walls defining said hatchway, water-tight packing means carried on said supporting members, said supporting members and said packing means being disposed at such a depth below said level of said deck that said upper surface of each steel hatch cover section lies flush with the deck when said sections engage said supporting members and said packing means, respectively, in closing position of said sections on said hatchway, and eccentric bush rollers connected to said sections and engageable with said supporting members whereby said sections may be selectively lowered down on said packing means to provide a water-tight joint and may be raised clear of said packing means.

2. An arrangement according to claim 1 including planks filling the space between adjacent hatch cover sections and removably attachable thereto, said filling planks being positioned above said rollers and being lined substantially on the bottom and the sides thereof with felting.

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