

Dec. 17, 1968

U. S. I. NORDH ET AL

3,416,590

HATCH COVER OR SIMILAR CLOSURE MEMBER

Filed Sept. 7, 1965

3 Sheets-Sheet 1

FIG. 2

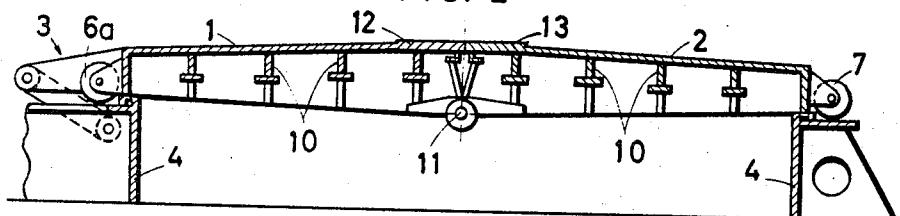
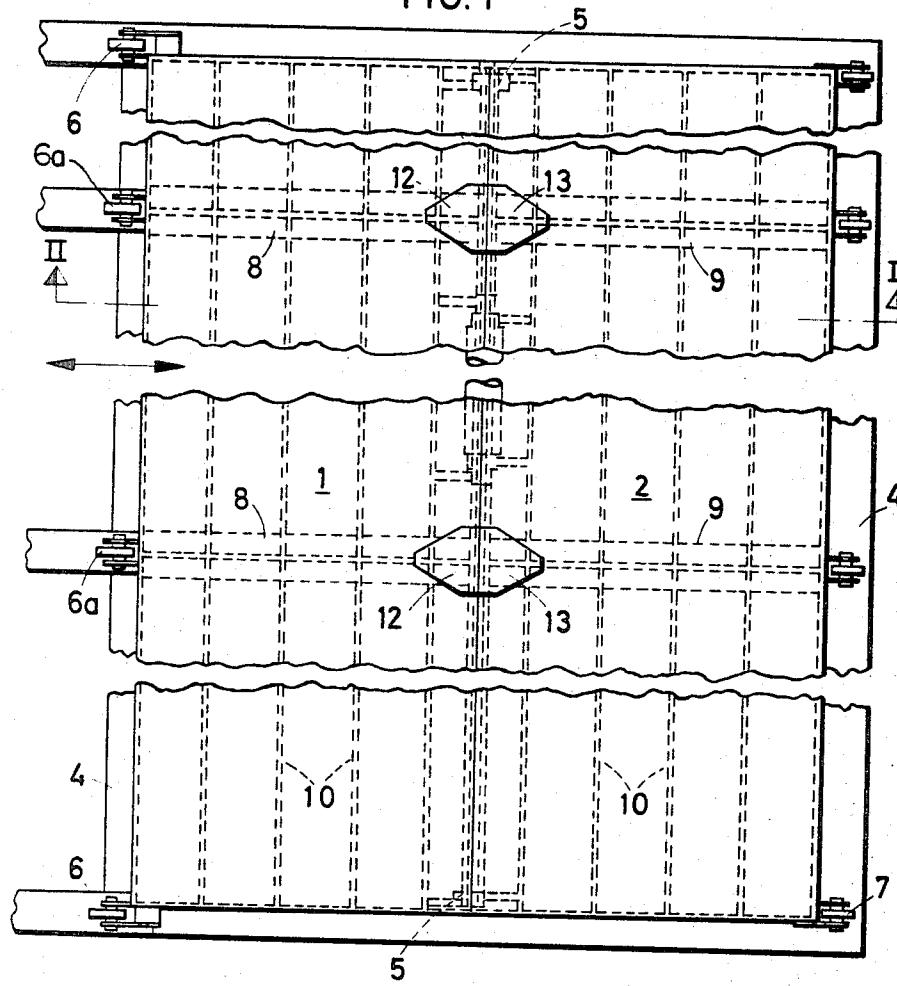


FIG. 1



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3 Sheets-Sheet 2

FIG. 3

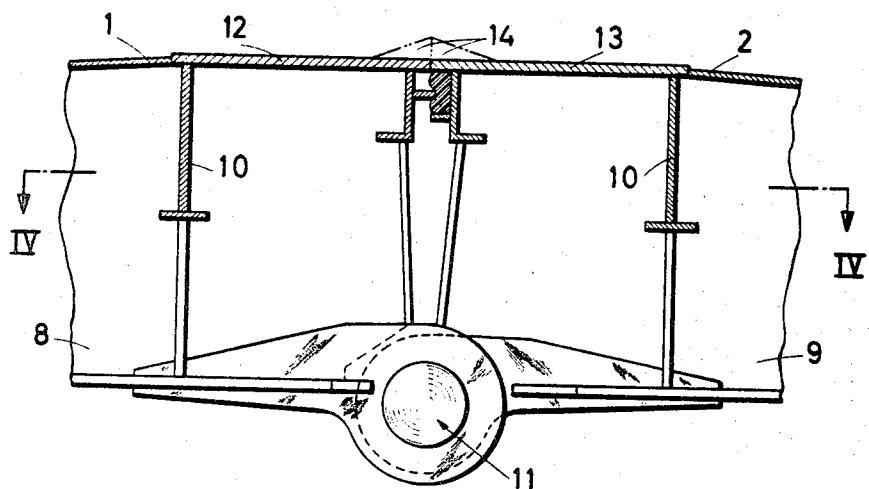
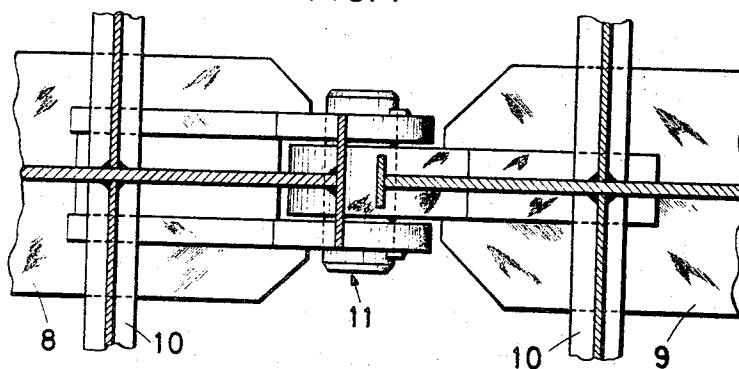


FIG. 4



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3 Sheets-Sheet 3

FIG. 5

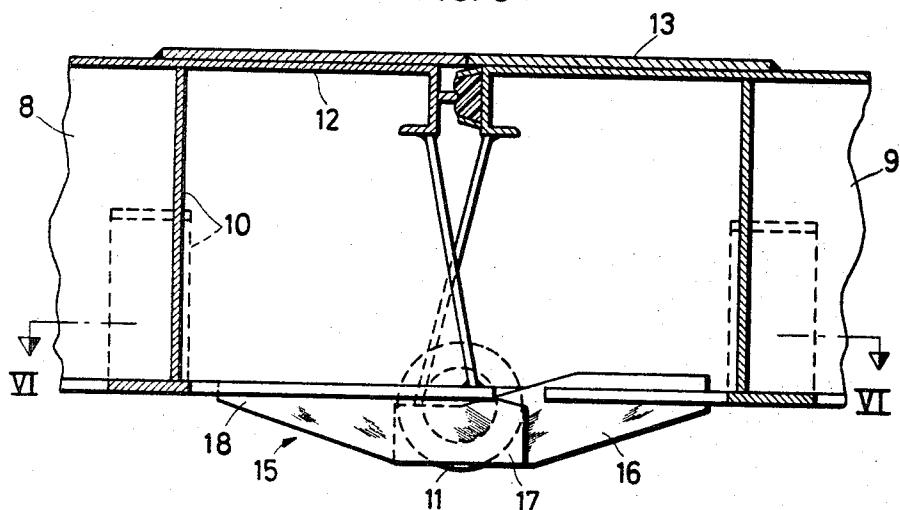
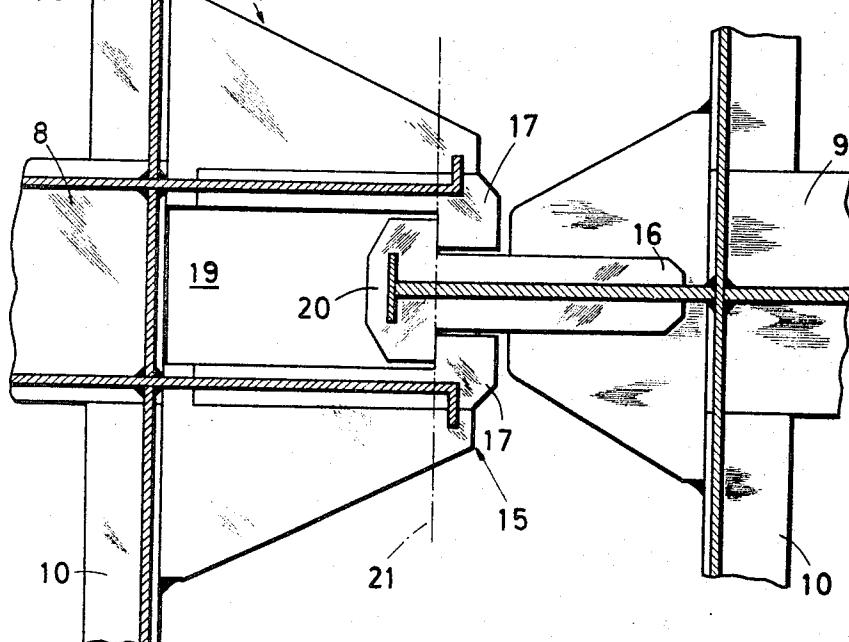


FIG. 6



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HATCH COVER OR SIMILAR CLOSURE MEMBER  
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11,782/64

4 Claims. (Cl. 160—213)

## ABSTRACT OF THE DISCLOSURE

A cover for a rectangular hatchway is formed of sections connected together in pairs by means of folding hinges, and one side edge of one section of each pair is swingably secured to a long side of a coaming about said hatchway. A plurality of two-part articulated strengthening beams perpendicular to said long side of the coaming are secured to the sections. In extended form, each such beam rests with both ends on such coaming. The beams are foldable in the same manner as, and with, said cover sections. At the folding joint of each articulated joint there are provided means for counteracting downward acting forces on such joint.

The present invention refers to a hatch cover or a similar closure member for a rectangular opening, especially an opening where the length is considerably greater than the breadth. The cover consists of sections pairwise interconnected by means of folding hinges, one section of each pair being swingably mounted on the coaming.

Hitherto known cover designs of this type are usually made of steel and are a development of the early design of covers, where wooden slabs were carried by cross beams, usually arranged athwartships. The steel covers are often provided with stiffeners built into the cover and running parallel to the swinging axis. These stiffeners act as a substitute for the old cross beams and distribute the weight of the cover evenly along the coaming.

The increase of ships' sizes and also the desire to accommodate special cargoes has brought about hatch openings of considerable dimensions. The ratio between the sides of the hatch opening may be as much as 1:3. The swinging hinge is usually located at the shortest side of the opening but the cover sections must nevertheless be designed to take care of the stresses brought about by considerable spans. The stiffeners built into the cover will therefore necessitate a deep web and the whole construction will be heavy and difficult to handle.

One object of the present invention is to bring about an arrangement, where the swinging side of the cover coincides with the long side of the opening, and where a considerable part of the strength is located in a few carrying beams, which transfer the load to the coaming at certain points. In this manner the cover part proper may be designed lighter and a total reduction of weight corresponding to 25-30% may be obtained. The cover will also be less rigid, whereby a better alignment at the sealing edges is obtained. These beams are foldable in the same manner as the covers and a common operating gear may be utilized.

A further object of the invention is to provide means at the folding joint of each beam adapted to counteract downward acting forces in said joint.

In the drawings:

FIGURE 1 shows a view of a cover according to the invention as seen from above.

FIGURE 2 is a section along line II-II in FIGURE 1.  
FIGURE 3 shows on a larger scale the joint of a beam.

FIGURE 4 is a section along line IV-IV in FIGURE 3.

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FIGURE 5 shows means for relieving the stress in the folding hinges and

FIGURE 6 is a section along line VI-VI in FIGURE 5.

5 The hatch cover shown in FIGURES 1 and 2 consists of two sections 1 and 2 of which one, 1, is swingably mounted, by means of a suitable hinge device 3 upon one of the long sides of the coaming 4. In the folding joint between the sections hinges 5 are provided and arranged in such a manner that the sections during opening will be folded with their undersides against each other. The sections are further at their outer corners provided with wheels 6 and 6a which are adapted to roll upon the broad sides of the hatch coaming throughout opening and closing movements, and with wheel 7 which will be further described hereinbelow.

10 The hinged connected sections have considerably greater length than corresponds to the combined breadth of a pair of sections. The weight of the sections 1 and 2 is mainly carried by two two-part beams 8, 9 arranged at right angles to the swinging axis and located at about one third of the length of the section, as counted from the broad sides thereof. At their free or pivot ends, the beams 8, 9 are provided with wheels 7 which roll on the sides of the coaming during a small part, only, of the total movement of the cover sections, to wit at the beginning of the folding movement and at the ending of the unfolding movement. The beams have such a length that their ends, when the cover is closed, will rest upon the long sides of the coaming and will transfer to the coaming an essential part of the weight of the sections of which they are parts. In the shown design each beam will actually transfer about one third of the load to certain points of the long sides of the coaming, whereas comparatively weaker stiffeners 10 arranged at right angles to these beams and parallel to the swinging axis will transfer one sixth to each of the broad sides of the coaming as a distributed load. Depending on the length of the opening any number of beams may be used.

15 20 25 30 35 40 45 The downwardly directed forces acting in the joint between the beam parts will in the embodiments according to FIGURES 1-5 be taken care of by a strong hinge 11 arranged at the lower edge of the beams, together with pressure plates 12, 13 arranged at the top part of the beam. These plates may possibly be provided with backing members 14.

50 55 60 65 70 75 80 85 90 As shown in FIGURE 6 the hinge 11 may be supplemented or substituted by a locking link 15 containing a T-shaped stud 16 connected to one part of the beam. This stud co-operates with a counterpart 18 having locking lips 17 at the other beam part. The counterpart has a recess 19, which is somewhat broader than the cross bar 20 of the T-shaped stud, and which has such a length that during a folding of the sections along the dash-dotted line 21 the cross bar 20 may leave the locking lips. During a continued folding of the section the cross bar 20 will be completely removed from the recess 19.

The cover may be utilized as a closure member for store rooms and similar spaces and with hatch covers it shall be noted that it is of no importance how the "long" and "broad" sides of the opening are arranged in relation to the longitudinal direction of the ship.

What we claim is:

1. A hatch cover or similar closure member for an opening where the length is considerably greater than the breadth, said opening being bordered by a coaming, said cover consisting of sections pairwise interconnected by means of folding hinges comprising

70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 1230 1235 1240 1245 1250 1255 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9260 9265 9270 9275 9280 9285 92

right angles to the long sides of the coaming and being foldable in the same manner as the sections, each beam being provided with an antifriction member at each end and being spaced inwardly from the short side of the coaming and having sufficient length in extended position to rest with both ends on the long sides of the coaming.

2. A hatch cover according to claim 1, which further include a link member located at the underside of each beam and connecting the two parts thereof, and a pressure plate arranged at the upper side of each beam part near the joint.

3. A hatch cover according to claim 2, in which the link member contains a T-shaped stud at one beam part adapted in closed position of the cover to fit into and to co-operate with a counterpart at the other beam part having a correspondingly shaped recess provided with locking lips.

4. A hatch cover or similar closure member for a rectangular opening the length of which is considerably greater than its breadth, which opening is bordered by a coaming, which comprises a pair of cover sections which in extended (closed) position cover said opening; folding hinges interconnecting said sections at their adjacent long edges; swinging hinge means connecting one of said cover sections to one long side of the coaming; two spaced strong two-part articulated beams in said

5 cover sections said beams extending at right angles to the long sides of the coaming and being foldable in the same manner as the cover sections; each said beam being spaced inwardly from the short side of the coaming and when in extending position spanning said opening and resting on the long sides of the coaming; a link member, comprising a hinge, located at the underside of each beam and connecting the two parts thereof; each said link member further including a T-shaped stud at one beam end and a corresponding recess provided with locking lips at the confronting beam end; said stud, when the cover sections are in extended position, fitting into and cooperating with said recess whereby to counteract downwardly acting forces at the articulations of the beams.

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