June 26, 1934. J. W. ISHERWOOD ET AL 1,964,203

LOCKING MEANS FOR HATCH COVERS

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FIG. 2

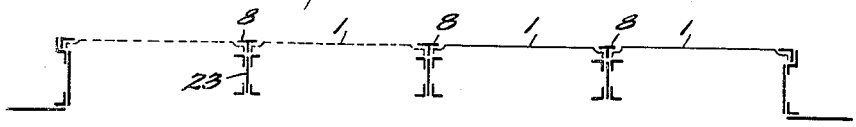


FIG. 1.

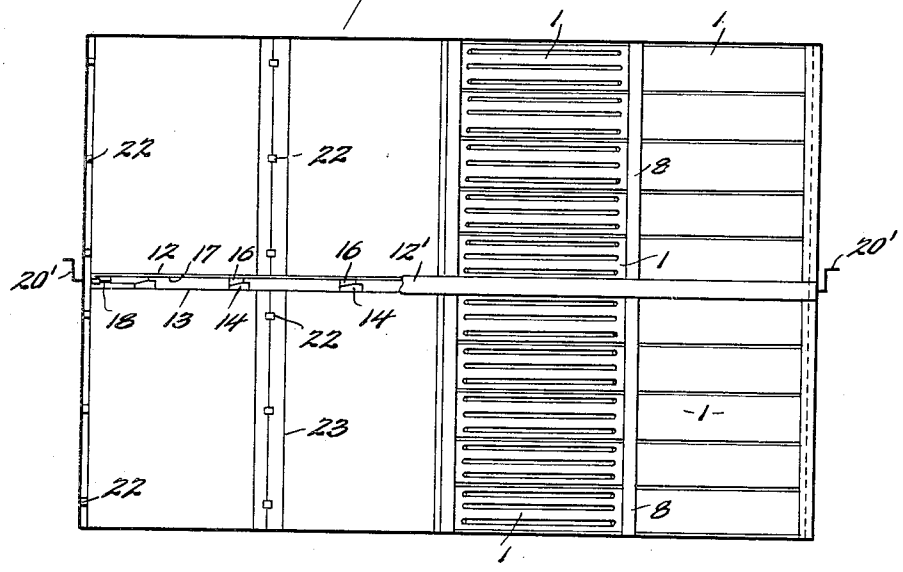


FIG. 3.

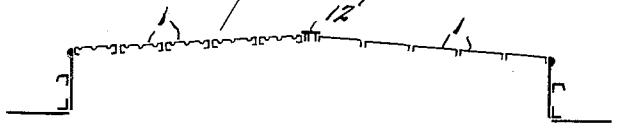
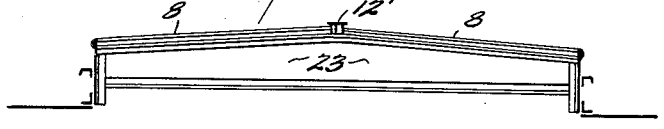


FIG. 4.



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LOCKING MEANS FOR HATCH COVERS

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FIG. 5.

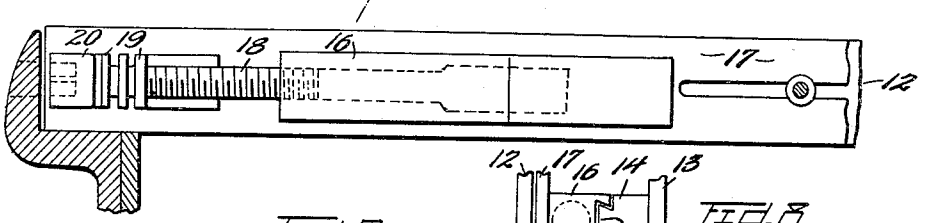


FIG. 8.

FIG. 6.

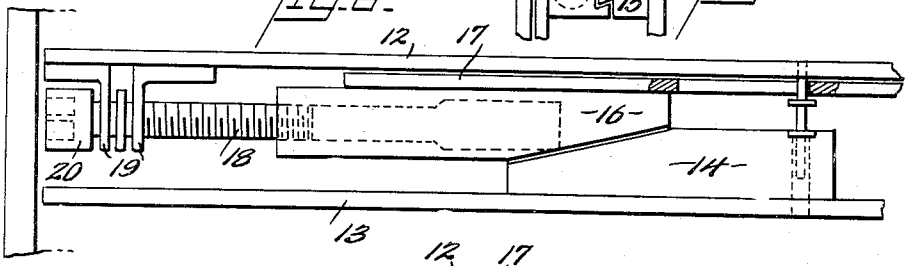


FIG. 7.

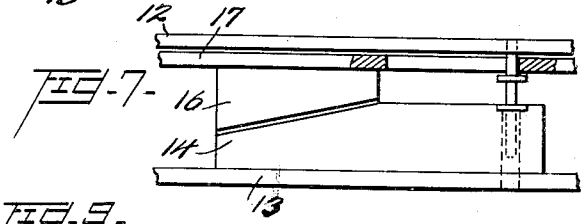


FIG. 9.

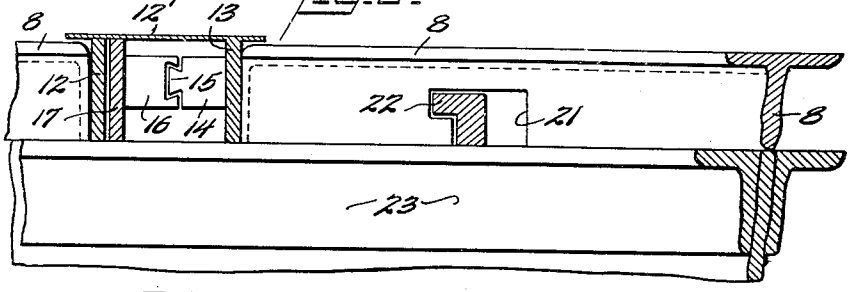


FIG. 11.

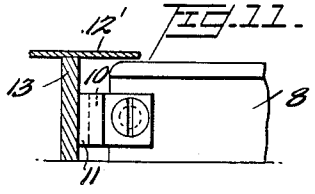


FIG. 10.

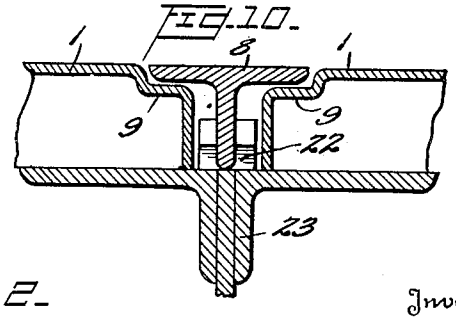
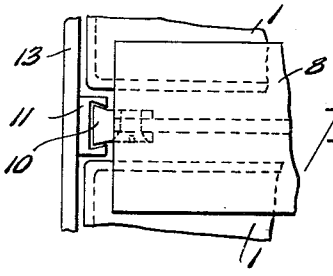


FIG. 12.



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LOCKING MEANS FOR HATCH COVERS

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FIG. 13.

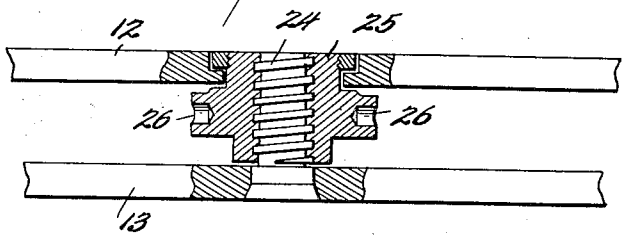


FIG. 14.

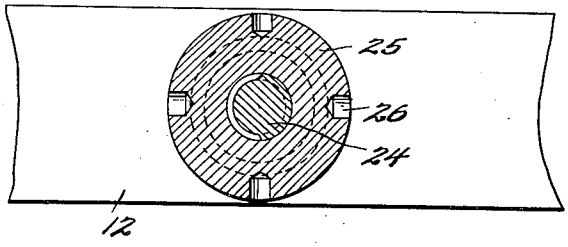


FIG. 15.

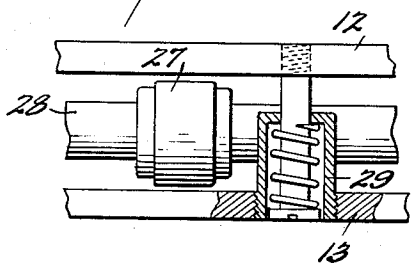
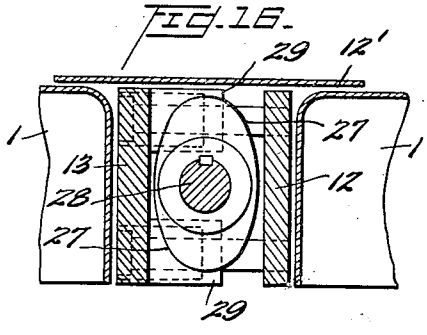


FIG. 16.



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LOCKING MEANS FOR HATCH COVERS

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FIG. 18.

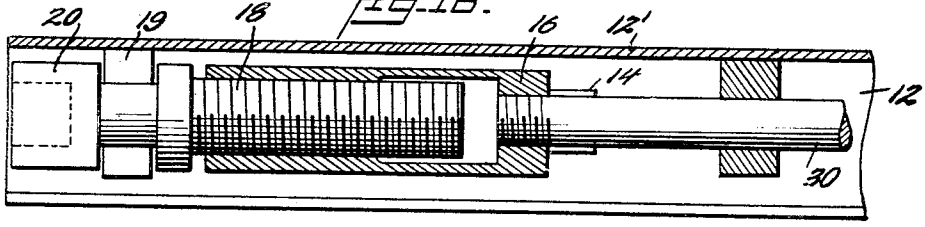


FIG. 17.

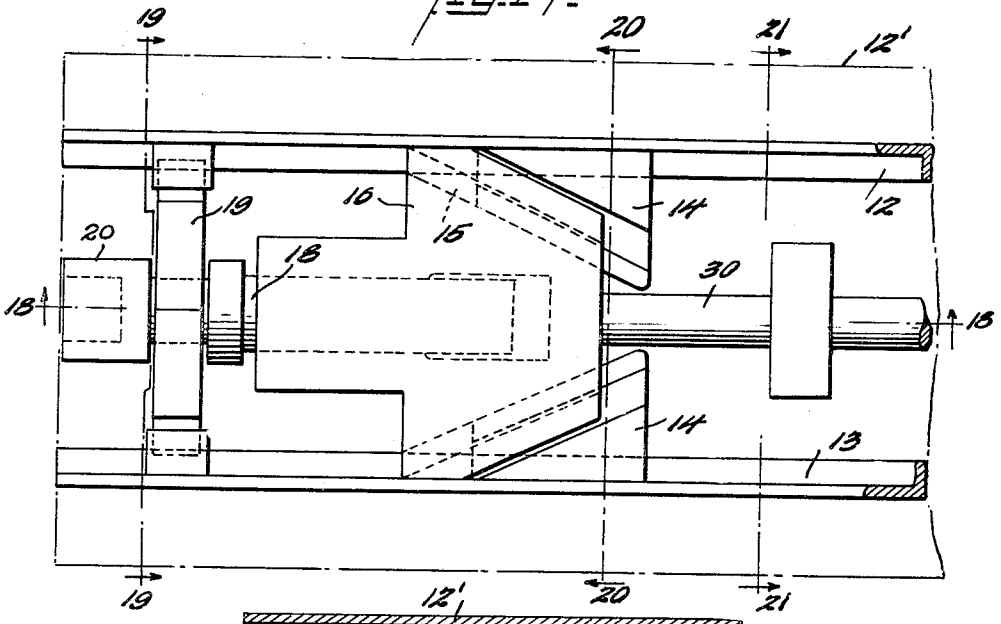


FIG. 19.

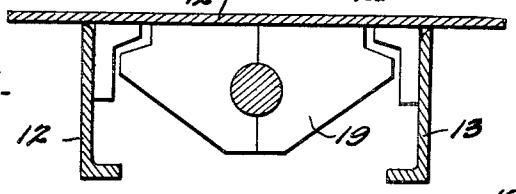


FIG. 20.

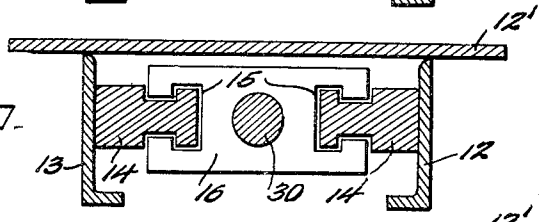
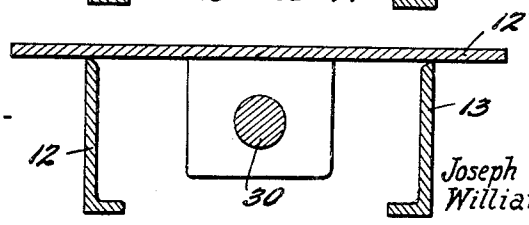


FIG. 21.



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LOCKING MEANS FOR HATCH COVERS

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FIG. 23.

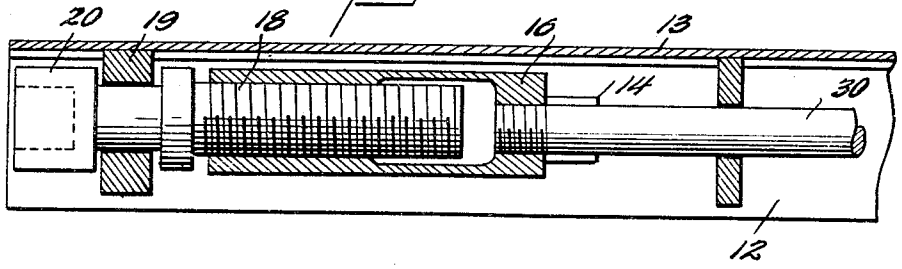


FIG. 22.

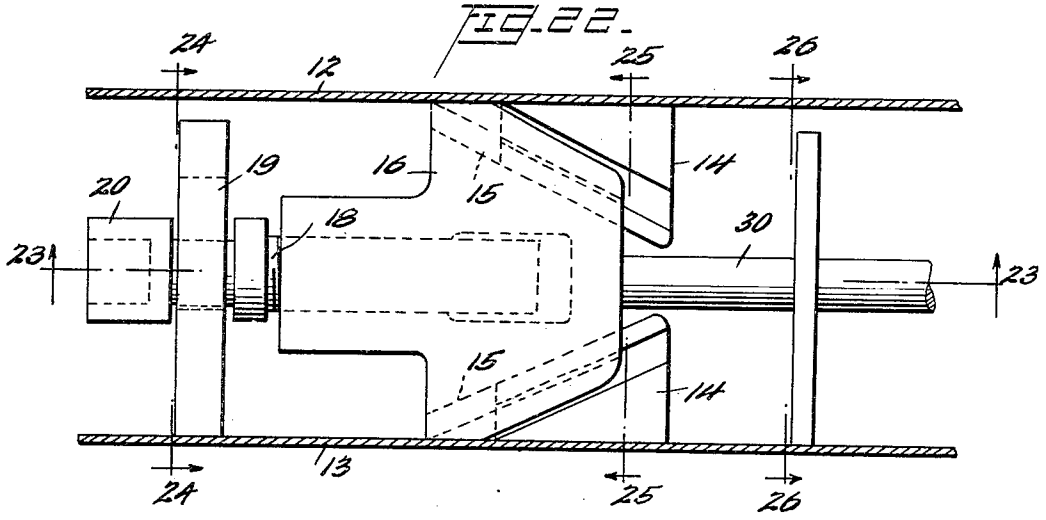


FIG. 24.

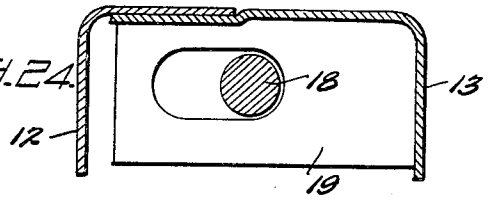


FIG. 25.

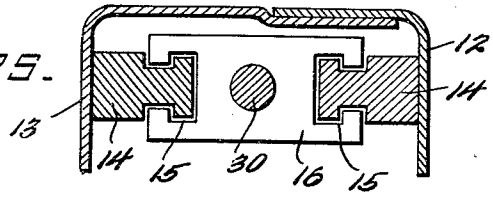
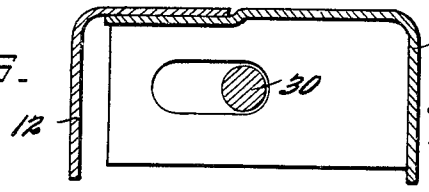


FIG. 26.



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UNITED STATES PATENT OFFICE

1,964,203

LOCKING MEANS FOR HATCH COVERS

Joseph William Isherwood and William Isherwood, Chislehurst, England

Application December 8, 1932, Serial No. 646,338
In Great Britain February 16, 1932

18 Claims. (Cl. 114—201)

This invention relates to means for locking or jamming movable members together against movement and is particularly suitable for locking hatch cover sections such as disclosed in our U. S. Letters Patent No. 1,679,526 granted August 7, 1928 entitled Hatch cover.

Locking or jamming means according to the present invention comprises an expander device adapted to be inserted between adjacent members to be locked or jammed together, said device comprising a pair of strips and means for moving the strips away from one another, whereby the members are caused to jam one against the other.

The means for moving the strips away from one another preferably comprises co-operating cam surfaces or wedges which interengage so as to transmit movement imparted to the expander device in both directions (i. e. the strips are moved towards and away from one another). Movement of the expander device may for example be obtained by screw and nut, or cam gear.

It is obvious that the strips can be made of sectional material of any suitable shape, i. e. the strips may be of plain plate, rolled section, either half round, angles or flat, or they may be plate flanged on one or both edges.

Referring to the accompanying drawings forming a part of this specification and in which like characters designate like parts in all the views,—

Fig. 1 is a plan view of a hatch, with sectional covers of different types shown fitted in the right hand half;

Fig. 2 is a diagrammatic representation of a longitudinal section of the hatch shown in Fig. 1;

Fig. 3 is a diagrammatic representation of a transverse section of said hatch;

Fig. 4 is a diagrammatic representation of a transverse section of said hatch with the sectional covers removed and showing a transverse web in elevation;

Fig. 5 is a detail vertical sectional view illustrating a means for actuating one form of expander device;

Fig. 6 is a detail top plan view of the parts shown in Fig. 5;

Fig. 7 is a detail top plan view of an expander device disposed at intervals across the hatch;

Fig. 8 is a diagrammatic cross sectional view through the expander device shown in Fig. 6;

Fig. 9 is a detail sectional view illustrating the expander device and its cooperating T bar for locking the cover sections in place;

Fig. 10 is a detail sectional view taken transversely of a T bar illustrating the manner of securing cover sections;

Fig. 11 is a detail elevation partly in section illustrating the connection between a T bar and a movable member of the expander device;

Fig. 12 is a top plan view of the parts shown in Fig. 11;

Fig. 13 is a top plan view partly in section of a screw and nut form of expander device;

Fig. 14 is a sectional view taken transversely of the expander device shown in Fig. 13;

Fig. 15 is a top plan view of a cam type of expander device;

Fig. 16 is a transverse sectional view of the cam expander shown in Fig. 15;

Fig. 17 is a top plan view of an expander device which is a modification of the construction shown in Fig. 6;

Fig. 18 is a vertical sectional view taken as on the line 18—18 of Fig. 17 and looking in the direction of the arrows;

Fig. 19 is a transverse sectional view taken as on the line 19—19 of Fig. 17 and looking in the direction of the arrows;

Fig. 20 is a transverse sectional view taken as on the line 20—20 of Fig. 17 and looking in the direction of the arrows;

Fig. 21 is a transverse sectional view taken as on the line 21—21 of Fig. 17 and looking in the direction of the arrows;

Fig. 22 is a top plan view of the expander device of Fig. 17 with a modified form of associated movable members;

Fig. 23 is a vertical sectional view taken as on the line 23—23 of Fig. 22 and looking in the direction of the arrows;

Fig. 24 is a transverse sectional view taken as on the line 24—24 of Fig. 22 and looking in the direction of the arrows;

Fig. 25 is a transverse sectional view taken as on the line 25—25 of Fig. 22 and looking in the direction of the arrows; and

Fig. 26 is a transverse sectional view taken as on the line 26—26 of Fig. 22 and looking in the direction of the arrows.

One form of the invention as applied to locking of hatch cover sections is illustrated in Figures 1 to 12 of the drawings of which Figure 1 is a plan of a hatch, the right hand half of which is covered by independent and removable hatch cover sections, the left hand half having the sections and securing bars removed, the cover plate of the expander bar being partly broken away to illustrate the arrangement of wedges and actuating device for the side strips of the expander bar.

Figure 2 is a longitudinal section and Figure 3 a section through the right hand bay of the hatch shown in Figure 1, different types of sections being shown, Figure 4 is a part section through one of the webs shown in Figure 1. Figures 5 to 12 are detail views of the arrangement shown in Figures 1 to 4. Figures 13 to 16 are detail views of different forms of expanders, and Figures 17 to 26 are modifications of the expander construction shown in Figures 1 to 12.

Referring to Figures 1 to 12 the hatch cover is formed by a plurality of sections 1, which may, as shown in Figures 1 and 3, be either formed with grooves or corrugations or with plane surfaces, the corrugated construction being illustrated on the left hand half of Figure 3 and the second bay of Figure 1, and the plane construction being illustrated on the right hand half of Figure 3 and in the first bay of Figure 1. These hatch sections are locked in position by T shaped securing bars 8 the flanges of which overlie reduced ends 9 formed on the hatch sections (see Figure 10) the securing bars being arranged over one or more hatch webs 23 which support the cover sections, said webs being fitted either transversely or longitudinally as desired.

The bars are provided at their ends with dovetail pieces 10 which extend into dovetail slots formed in members 11 secured to strips 12, 13. The strip 13 is provided with wedge shaped blocks 14 having dovetail projections 15 engaging dovetail slots formed in wedge shaped pieces 16 secured to a strip 17. The end wedge shaped piece 16 is provided with a screw threaded hole into which extends a screw threaded rod 18 journalled in a bearing 19 and provided with a head 20 for the reception of any convenient actuating device such as a cranked handle 20'. The T-shaped bars 8 are provided with L-shaped slots 21 into which extend L-shaped projections 22 secured to supporting webs 23 of the hatch and to the coaming. The bar 13 has welded thereto a plate 12' which forms a closure for the gap between the strips 12, 13 and the sections 1.

In operation when the screw rod 18 is rotated the cooperating wedges 14 and 16 cause the strips 12 and 13 to move away from one another, their movement being transmitted to the T-shaped securing bars 8 through the dovetail interconnection 10 so that the slots 21 in the T-pieces move into locking engagement with the projections 22, whereby the hatch sections are secured in position. The movement of the strips 12, 13 also causes the hatch sections to jam against one another thus effectively securing the covers in position.

When it is desired to unlock the hatch sections the screw rod 18 is rotated in the reverse direction and the strips 12, 13 caused to approach one another thus enabling the T-shaped securing bars to be moved and the slots 21 therein moved out of engagement with the projections 22. The T-bars can then be lifted and disconnected from their dovetail joint with the strips 12 and 13, thereby making possible the removal of the cover sections.

In the modified forms shown in Figures 13 and 14, the wedge shaped pieces 14 and 16 are replaced by a screw 24 and nut 25, the screw 24 being secured against axial movement of the strip 13, and the nut 25 having an annular recess which engages the strip 12, the nut being also provided with tommy holes or notches 26 to enable the nut to be rotated.

In the modified forms shown in Figures 15 and 16 movement of the strips 12, 13 is effected by cams 27 mounted on a shaft 28, the shaft when rotated in one direction causing the cams to effect the separation of the strips against the action of springs located in housings 29 and when rotated in the other direction allowing the strips to be moved toward each other by the springs.

A further modification is illustrated in Figures 17 to 26 which concerns the actuation or construction of the strips 12, 13.

Figures 17 to 21 show respectively a plan view, a longitudinal sectional view, and several transverse sectional views of one form of construction, whilst Figures 22 to 26 show respectively a plan view, a longitudinal view, and several transverse sectional views of a slightly different construction.

Referring to Figures 17 to 21 the actuating strip designated 17 in Figure 6 is replaced by a central rod 30 to which the wedge-shaped pieces 16 are secured. The end wedge-shaped piece is provided, as in the arrangement described with reference to Figures 1 to 12, with a screw threaded rod 18, the remaining wedge-shaped pieces 16 being actuated through this rod 18 as previously described. The wedge-shaped pieces 16 engage with the wedge-shaped pieces 14 which in this modification, are secured to the strips 12 and 13.

Referring now to Figures 22 to 26 the strips 12 and 13 are made preferably of flanged plates overlapping at the top, thus forming a cover plate and dispensing with the type of cover plate shown at 12' in Figure 20. It is obvious that the top plate can be joggled as in Figures 24 to 26, or made flat as indicated in dotted lines in Figure 26. The movement of the strips 12 and 13 away from, or toward each other, may be effected by wedges as shown on Figures 17 and 22, and as described in relation to Figures 17 to 21, or by screw and nut, cams, springs, or other suitable means.

While the invention has been described in the foregoing in conjunction with hatch cover sections, it may also be used for other purposes such for example as for securing metal plate, angle bars and the like for planing, drilling, etc. or for compressing paper pulp and like material and for baling hay or other substances.

It is obvious that those skilled in the art may vary the details of construction as well as arrangements of parts without departing from the spirit of the invention, and therefore it is not desired to be limited to the foregoing except as may be required by the claims.

What is claimed is:—

1. Means for locking and jamming movable members together against movement comprising an expander device adapted to be inserted between adjacent members along the sides thereof, as well as a bar extending transversely from said device on each side thereof, each bar for securing the ends of the members, said device comprising a pair of strips and means for moving the strips away from one another whereby the members are caused to jam one against the other, and the bars are caused to lock the ends of said members.

2. An arrangement as claimed in claim 1 in which the strips are separated by co-operating wedges.

3. An arrangement as claimed in claim 1 in which the strips are separated by screw and nut.

4. An arrangement as claimed in claim 1 in which movement is transmitted in both directions.

5. An arrangement as claimed in claim 1, in

which the strips are so shaped as to form a closure plate for the actuating mechanism substantially as described.

6. An arrangement as claimed in claim 1 in which one of the strips is provided with a closure plate, substantially as described.

7. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; a plate engaging an end of said bar; and means including a second plate contacting said first plate and operating transversely of said bar to move said bar longitudinally of itself and into locking engagement with said sections.

8. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; a plate engaging an end of said bar and movable therewith; and means including a second plate contacting said first plate and operating transversely of said bar to move said bar longitudinally of itself and into locking engagement with said sections.

9. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; and screw-actuated means disposed in the plane of said sections and operating transversely of said bar to move said bar into locking engagement with respect to said sections.

10. In a hatch the combination of a cover comprising a plurality of small sections; arranged side by side with their ends in alignment; a bar adapted to secure the aligned ends of said sections; and cam-operated means to move said bar into locking engagement with respect to said sections, said means disposed along a side of one of said sections and operating in the plane of all of said sections.

11. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; and means including a spring-tensioned cam-actuated plate engaging an end of said bar to move said bar into locking engagement with respect to said sections.

12. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; and means including a spring-returned cam-actuated plate disposed along a side of one of the sections and engaging an end of said bar to move said bar into locking engagement with respect to said sections.

13. In a hatch the combination of a cover comprising a plurality of small sections; a plate; a bar adapted to secure a plurality of said sections said bar readily removable through the provision of a dovetail connection at one end with said plate; and means operating through said plate to move said bar into locking and unlocking engagement with respect to said sections.

14. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; a plate engaging an end of said bar; means including a second plate contacting said first plate and operating transversely of said bar to move said bar into locking engagement with respect to said sections; and a closure disposed over said means, said closure carried by said first named plate.

15. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; a plate engaging an end of said bar; means including a second plate contacting said first plate and operating transversely of said bar to move said bar into locking engagement with respect to said sections; and a closure disposed over said means, said closure comprising a plate member carried by said first named plate.

16. In a hatch the combination of a cover comprising a plurality of small sections; a bar adapted to secure a plurality of said sections; a plate engaging an end of said bar; means including a second plate contacting said first plate and operating transversely of said bar to move said bar into locking engagement with respect to said sections; and a closure disposed over said means, said closure comprising an extension of said first named plate, said extension disposed substantially at right angles to the plane of said plate.

17. In a hatch the combination of a cover comprising a plurality of small sections arranged in a row; a bar adapted to secure the sections thereof in place; a plate attached transversely to an end of said bar and extending along an end of said row; and means to move said plate transversely, causing longitudinal movement of said bar into locking engagement with said sections, said means comprising a plurality of elements disposed at intervals along said plate and a mechanism simultaneously operating said elements upon movement of said plate.

18. In a hatch the combination of a cover comprising a plurality of small sections arranged in plural rows; a bar disposed between two adjacent rows and adapted to secure the sections thereof in place; a plate attached transversely to an end of said bar and extending along an end of a row; and means to move said plate transversely of itself, causing longitudinal movement of said bar into locking engagement with said sections, said means comprising a plurality of elements disposed at intervals along said plate and a mechanism simultaneously operating said elements upon movement of said plate.

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