Aug. 23, 1932. W. L. KRAEMER 1,872,976

WATERTIGHT SHIP'S WINDOW

Filed March 29, 1930 2 Sheets-Sheet 1

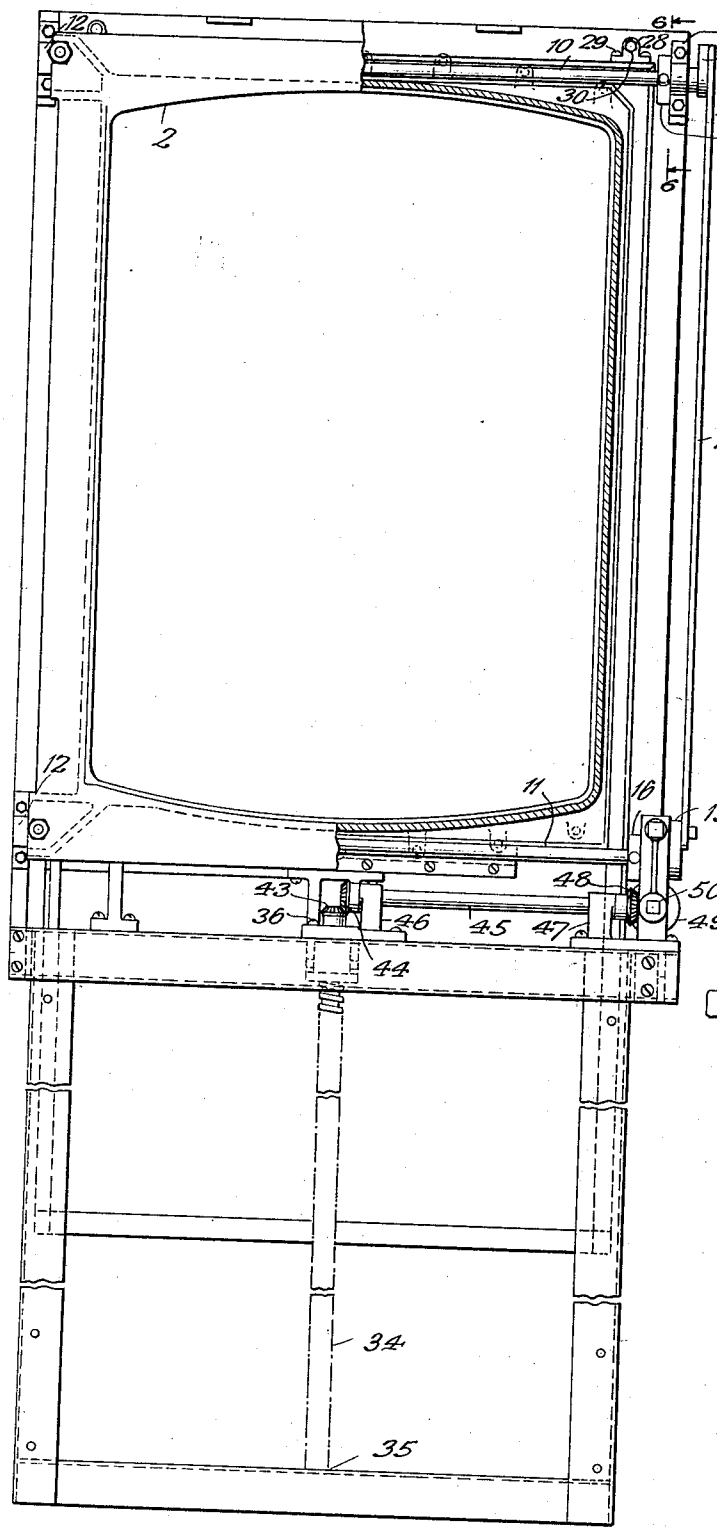


Fig. 1.

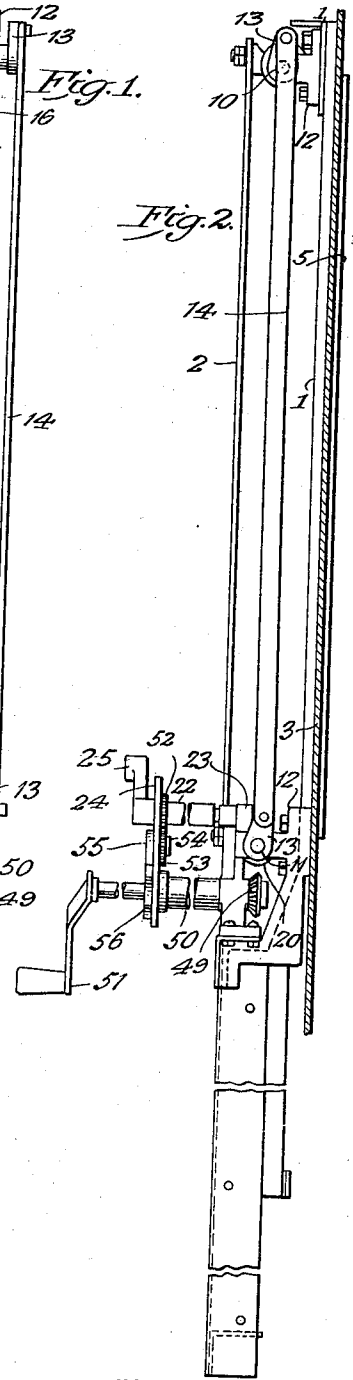


Fig. 2.

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Fig. 3.

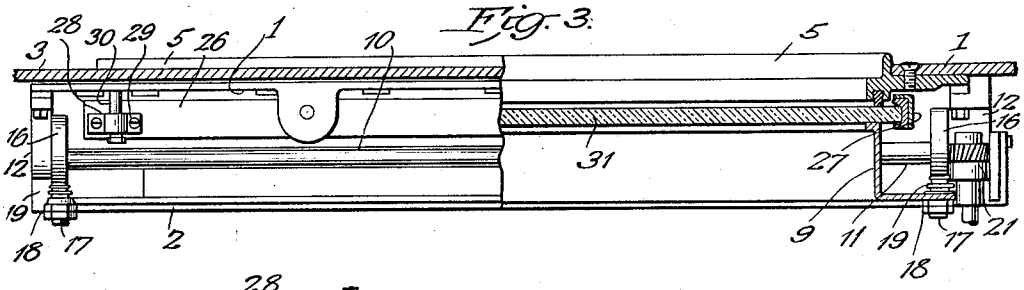
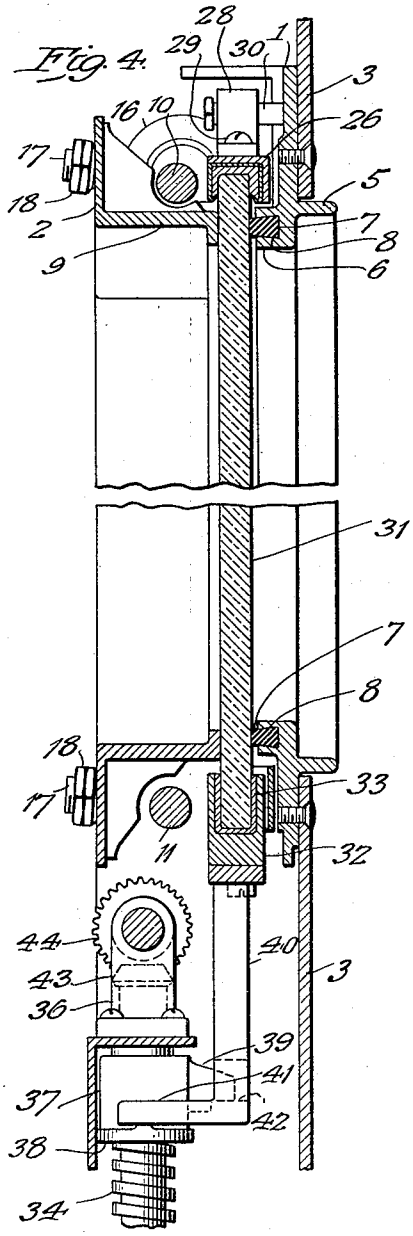


Fig. 4.



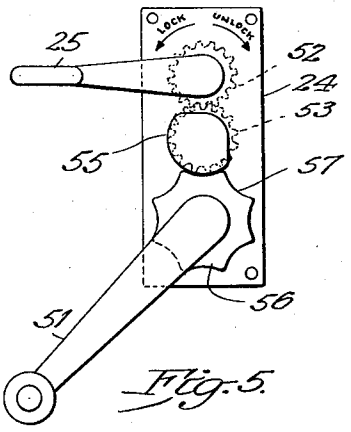
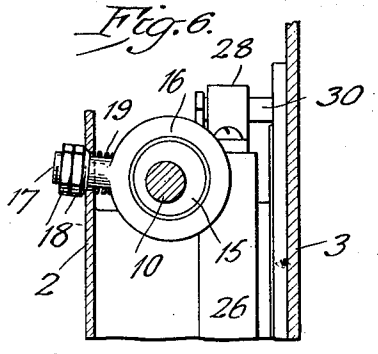


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE

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WATERTIGHT SHIP'S WINDOW

Application filed March 29, 1930. Serial No. 439,869.

The windows of most types of habitable structure are frequently opened and closed, and in certain types of structures it is essential that the windows be so constructed that in addition to being readily and easily opened and closed, they be firmly sealed in closed position in order that during bad weather conditions, they will exclude, wind, water and other objectional manifestations of the elements. This essential is particularly important in the case of ships and other similar transportation vehicles, and it is to a window for such structures that my invention relates.

Windows of traveling conveyances are subjected to conditions more severe than are those in stationary buildings. This is particularly true in the case of ships, the windows of which are subjected, especially during storms, to severe conditions, since they are at times completely submerged in water. Under such conditions, it is essential that the windows be so constructed as to prevent the ingress of water to the interior of the ship and between the walls of the structure.

By my invention, I am enabled to construct a window which is readily and easily opened and closed, and which may be firmly sealed to exclude the objectional elements of nature. I employ a construction in which the window-pane is slidably mounted between two window-frame members which are movable laterally with respect to each other so that the window-pane may be firmly clamped therebetween.

An advantage of my construction is the fact that the window-pane may be firmly clamped between the frame members in any position of its movement.

A feature of my invention is the provision of an interlocking device which, upon actuation of the means for clamping the window-pane between the frame members, is operative to lock the window-pane traversing means.

Specifically, I employ a window construction in which there are two frame members, an outer frame member which is adapted to be secured to the side of the structure in which the window is placed, and an inner frame member spaced laterally therefrom. A gasket is secured to and extends laterally from the inner surface of the outer frame member, the gasket extending completely around the window opening in the frame member. Two shafts, parallel to the planes of the frame members, are journaled between the latter in bearing brackets secured to the inner surface of the outer frame member. The shafts extend across the frame members, one above and one below the window openings therein. To these shafts, which are connected together for synchronous operation, the inner frame member is connected by means of eccentrics and cooperating eccentric straps whereby rotational movement of the shafts is translated into lateral movement of the inner frame member. The shafts may be rotated to move the inner frame member laterally by means of a handle provided for that purpose. Between the inner and outer frame members, there is provided a guideway which is movably supported by the outer frame member for lateral movement with respect thereto. A frameless window-pane is slidably mounted in the guideway, and traversing means are provided for raising and lowering the window-pane in the guideway. An interlocking device is provided which is operative to lock the window-pane traversing means upon movement of the inner frame member to clamp the window-pane against the gasket in the outer frame member.

Other features and advantages of my invention will be apparent from the following particular description of one embodiment of my invention taken in connection with the accompanying drawings in which:

Fig. 1 is a front elevation partly in section;

Fig. 2 is a side elevation of the same;

Fig. 3 is a plan of the same partly in section;

Fig. 4 is an enlarged longitudinal central section;

Fig. 5 is a detail of the interlock; and

Fig. 6 is an enlarged fragmentary section taken on the line 6—6 of Fig. 1.

In the drawings, there is illustrated a window embodying my invention. The window

shown comprises an outer frame member 1 and an inner frame member 2. The outer member 1 is adapted to be secured to the side of the structure in which the window is placed and when used in ship construction, may be secured to the plates 3 thereof. This frame member is provided with integral outwardly and inwardly extending flanges 5 and 6 respectively defining the window opening therein. To the inner end of the inwardly extending flange 6, a gasket 7 is secured which extends completely around the window opening in the frame member. The gasket may, as shown, be dovetailed into a groove 8 provided therefor in the end of the flange 6.

The inner frame member 2 which is supported in spaced relation to the outer frame member 1 is provided with an outwardly extending flange 9 defining the window opening therein, the end of the flange 9 being bent inwardly at a right angle parallel to the planes of the frame members and in alignment with the gasket 7 secured to the outer frame member 1.

Two shafts 10 and 11 extend across the frame members 1 and 2, parallel to the planes thereof, one above the upper portion of the flange 9 defining the upper edge of the window opening in the inner frame member 2, and the other below the lower portion of the flange 9 defining the lower edge of the window opening in the inner frame member 2. The shafts 10 and 11 are journaled near their ends in bearing brackets 12 secured to the inner surface of the outer frame member 1. Corresponding ends of the shafts 10 and 11 extend through the bearing brackets 12, and have cranks 13 secured on the extended ends thereof. The cranks 13 are connected together by a connecting rod 14 so that rotation of one shaft is transmitted, through the cranks and connecting rod, to the other shaft. Intermediate the ends of the shafts, adjacent each bearing bracket 12, eccentrics 15 are secured to the shafts. Cooperating with each eccentric, there is an eccentric strap 16 which has a threaded stud 17 formed integral therewith. The studs 17 extend through openings provided therefor in the inner frame member 2 and are held therein by nuts 18 acting against the inner surface of the frame member 2, the frame member being held against the nuts 18 by convolute springs 19 interposed between the eccentric straps and the outer surface of the frame member. Thus, rotational movement of the shafts 10 and 11 is translated into lateral movements of the inner frame member 2.

Rotational movement may be imparted to the shafts 10 and 11 to control the position of the frame member 2 through the following train of mechanism: Near the crank 13 on the lower shaft 11 there is secured a gear 20 which meshes with a gear 21 secured on the end of a short shaft 22 which is journaled at one end in a bearing bracket 23 and extends, at the other end, through a face plate 24. On the end of the shaft 22 extending through the plate 24, there is secured a handle 25 for rotating the shaft 22. Thus, movement of the handle 25 is transmitted to the shafts 10 and 11.

Between the outer and inner frame members 1 and 2, a window-pane guideway is supported. The guideway comprises a channel shape cross piece 26 which extends across the frame members, parallel thereto, above the flanges defining the openings therein. The length of the cross piece 26 is such that the ends thereof extend beyond the flanges on the frame members. To each end of the cross piece 26, a depending channel shape member 27 is secured. The guideway is supported by brackets 28 secured to the cross piece 26 by means of machine screws 29, the brackets 28 being slidably supported by bolts 30 extending through the brackets and threaded into the outer frame member 1. The slidable connection between the bolts 30 and the brackets 28 permits limited lateral movement of the guideway. The channel shape members making up the guideway serve to guide a frameless window-pane 31 between the frame members 1 and 2 and are preferably lined with pliable material as shown.

The window-pane 31 is supported and positioned by a clamp member 32 attached to the lower edge thereof. The clamp 32 may desirably consist of a channel-shape member as shown, a packing strip 33 being interposed between the glass window-pane and the metal. For raising and lowering the window-pane, a vertical traversing screw 34 is provided and is rotatably mounted at its lower end in a bearing 35 and at its upper end in a bearing 36. A nut 37 cooperates with the screw 34. The nut 37 is provided with an integral collar 38 at the lower edge thereof, and with an internal hook member 39. A link member 40 having integral projecting arms 41 which are adapted to cooperate with the collar 38 on the nut 37 and an opening 42 which is adapted to cooperate with the hook member 39 of the nut, is secured to the clamp member 32 in which the lower edge of the window-pane 31 is secured. On the upper end of the screw 34, there is secured a bevel gear 43 which meshes with a bevel gear 44 secured on one end of a shaft 45 journaled in bearing brackets 46 and 47. A second bevel gear 48 is secured on the opposite end of the shaft 45 and meshes with a bevel gear 49 secured on a short shaft 50 which is journaled at one end in the bearing bracket 23 and extends at the other end through the aforementioned face plate 24. On the end of the shaft 50 extending through the face plate 24, there is secured a handle 51 by means of which the shaft 50, and,

through the train just described, the screw 34, may be rotated. Rotation of the screw 34, by means of the nut 37, raises or lowers the window-pane 31 in the guideway depending upon the direction of rotation of the screw.

On the shaft 22, which may be rotated to move the inner frame member 2 laterally to clamp the window-pane between the frame members 1 and 2 against the gasket 7 in the outer frame member, there is secured, immediately behind the face plate 24, a spur gear 52. The gear 52 meshes with a gear 53 secured on a stub shaft 54 extending through the face plate 24 and having secured on the end in front of the face plate a cam 55. The cam 55 is adapted to cooperate with a cam 56 having a plurality of complementary cut out portions 57 secured to the shaft 50 of the window-pane traversing mechanism. Thus, when the handle 25 is rotated to clamp the window-pane between the frame members 1 and 2, as shown in Figure 5, the cam 55 is rotated so that the high portion thereof enters a cut out portion 57 in the cam 55 and thereby locks the shaft 50 which controls the raising and lowering of the window. This interlock prevents movement of the window-pane when it is clamped against the gasket 7 and thereby preserves the gasket which might be injured if the window-pane were forced when clamped against the gasket.

From the above description of the embodiment of my invention illustrated in the drawings it is evident that a window constructed in accordance with my invention may be readily and easily opened and closed, and also may be securely sealed to effectively exclude the elements.

It is obvious that various changes may be made in the embodiment shown in the drawings and above particularly described within the principle and scope of my invention as expressed in the appended claims.

I claim:

1. A window comprising, an outer frame member, an inner frame member movable laterally with respect to the outer frame member, said frame members having aligned window openings therein, a window-pane slidably mounted between the inner and outer frame members, traversing means for the window-pane, means for causing relative lateral movement between the inner and outer frame members to clamp the window pane therebetween, and an interlock between said frame moving means and said window-pane traversing means to prevent operation of the window-pane traversing means when the window-pane is clamped between frame members.

2. A window comprising an outer frame member having a window opening therein, a gasket secured to and extending from the inner surface of said outer frame member, the gasket extending completely around the window opening in the frame member, an inner frame member movable laterally with respect to the outer frame member and having a window opening therein in alignment with the opening in the outer frame member, a guidway between the outer and inner frame members, a window-pane adapted to slide in the guideway, traversing means for the window-pane, and means for causing relative lateral movement between the inner and outer frame members to clamp the window-pane therebetween.

3. A window comprising an outer frame member having a window opening therein, a gasket secured to and extending from the inner surface of the outer frame member, the gasket extending around the window opening in the frame member, an inner frame member movable laterally with respect to the outer frame member and having a window opening therein in alignment with the opening in the outer frame member, a guideway between the inner and outer frame members movably supported by the outer frame member for lateral movement with respect thereto, a frameless window-pane slidably mounted in said guideway, traversing means for the window-pane, and means for causing relative lateral movement between the inner and outer frame members to clamp the window-pane therebetween.

4. A window comprising an outer frame member having a window opening therein, a gasket secured to and extending laterally from the inner surface of the frame member, the gasket extending around the window opening in the frame member, two shafts extending across the outer frame member, one above the window opening in the frame member and the other below the opening in the frame member, means for rotating said shafts simultaneously, an inner frame member having a window opening therein in alignment with the window opening in the outer frame member, a connection between the shafts and the inner frame member whereby rotational movement of the shafts is translated into lateral movement of the inner frame member, a guideway between the inner and outer frame members movably supported by the outer frame member for lateral movement with respect thereto, a frameless window-pane slidably mounted in said guideway, and traversing means for the window-pane.

5. A window comprising an outer frame member having a window opening therein, a gasket secured to and extending laterally from the inner surface of the frame member, said gasket extending around the window opening in the frame member, an inner frame member having a window opening therein in alignment with the window opening in the outer frame member, two shafts extend-

ing across the outer frame member, one above the window opening in the frame member and the other below the window-opening in the frame member, bearing brackets for said shafts secured to the outer frame member, eccentrics on said shafts, eccentric straps connected to the inner frame member cooperating with the eccentrics on said shafts, means for rotating said shafts simultaneously, a guideway between the inner and outer frame members movably supported by the outer frame member for lateral movement with respect thereto, a frameless window-pane slidably mounted in said guideways, and traversing means for the window-pane.

6. A window comprising an outer frame member having a window opening therein, a gasket secured to and extending laterally from the inner surface of the frame member, said gasket extending around the window opening in the frame member, an inner frame member having a window opening therein in alignment with the window opening in the outer frame member, two shafts extending across the outer frame member, one above the window opening in the frame member and the other below the window opening in the frame member, bearing brackets for said shafts secured to the outer frame member, eccentrics on said shaft, eccentric straps connected to the inner frame member cooperating with the eccentrics on said shafts, crank arms on corresponding ends of said shafts, a connecting rod connecting said crank arms together for simultaneous operation of said shafts, means for rotating said shafts, a guide between the inner and outer frame members movably supported by the outer frame member for lateral movement with respect thereto, a frameless window-pane slidably mounted in said guideway, and traversing means for the window-pane.

7. A window comprising an outer frame member having a window opening therein, a gasket secured to and extending laterally from the inner surface of the frame member, said gasket extending around the window opening in the frame member, an inner frame member having a window opening therein in alignment with the window opening in the outer frame member, two shafts extending across the outer frame member, one above the window opening in the frame member and the other below the window opening in the frame member, bearing brackets for said shafts secured to the outer frame member, eccentrics on said shafts, eccentric straps connected to the inner frame member cooperating with the eccentrics on said shafts, crank arms on corresponding ends of said shafts, a connecting rod connecting said crank arms together for simultaneous operation of said shafts, means for rotating said shafts, a guideway between the inner and outer frame members movably supported by the outer frame member for lateral movement with respect thereto, a frameless window-pane slidably mounted in said guideway, traversing means for the window-pane, and an interlock between said shaft rotating means and said window-pane traversing means for locking the window-pane traversing means when the shaft rotating means is actuated to move the inner frame member toward the outer frame member.

In witness whereof, I hereunto subscribe my signature.

WALDO L. KRAEMER.