March 25, 1941. W. H. STRYKER 2,236,040

BRACE MEANS FOR PIVOTED CLOSURE

Filed April 6, 1938 2 Sheets-Sheet 1

Fig. 1

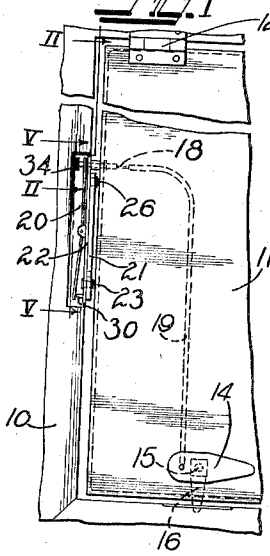


Fig. 2

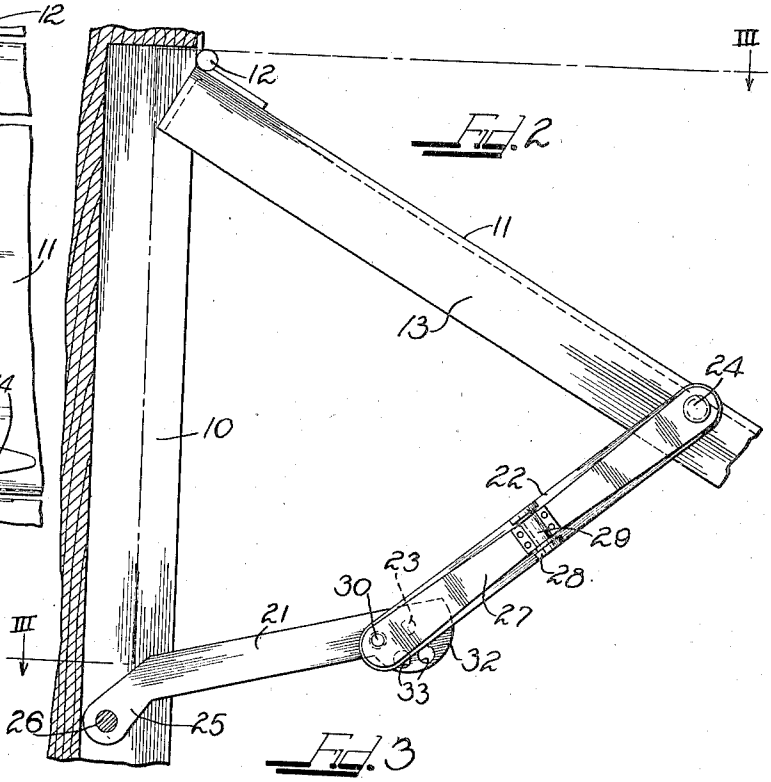


Fig. 3

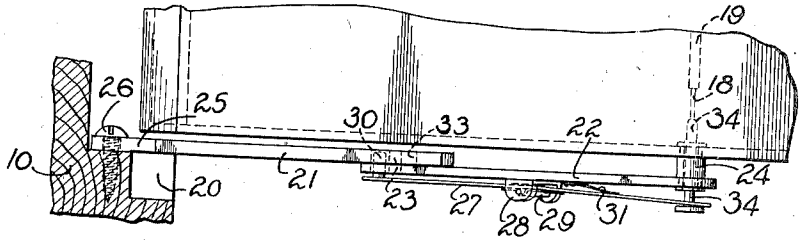
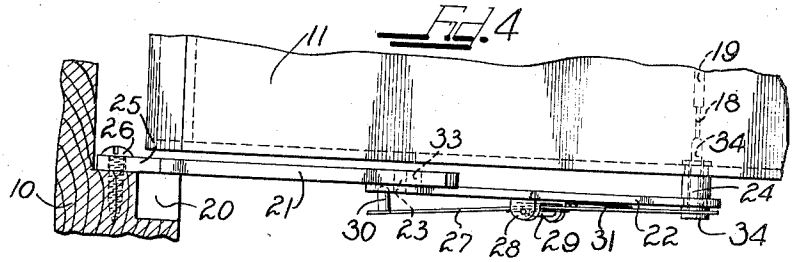


Fig. 4



Inventor

WILLIAM H. STRYKER

By Charles Pelz Attys.

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BRACE MEANS FOR PIVOTED CLOSURE

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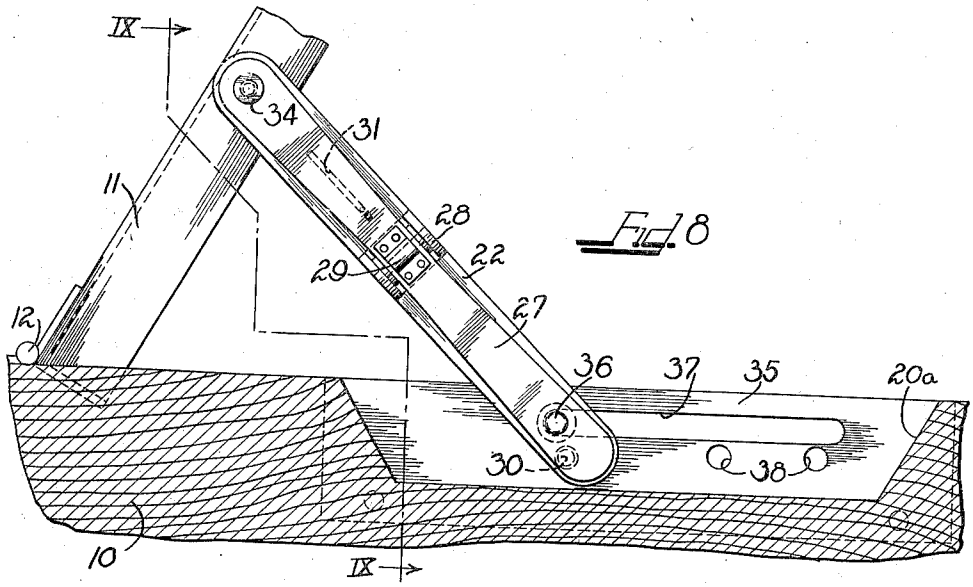


Fig. 8

Fig. 9

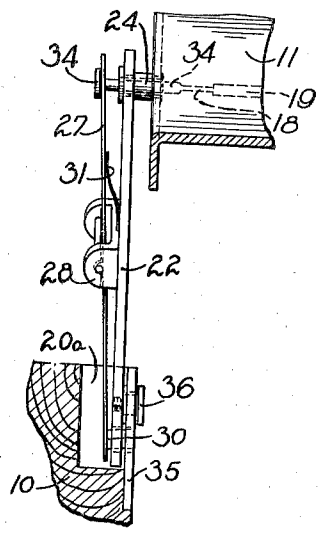


Fig. 5

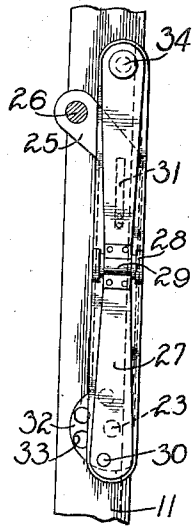


Fig. 6

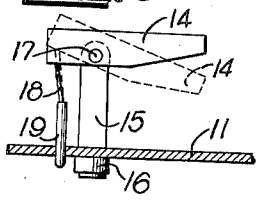
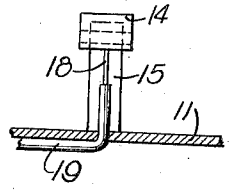


Fig. 7



Inventor

WILLIAM H. STRYKER

Charles Gill Attys.

Patented Mar. 25, 1941 2,236,040

UNITED STATES PATENT OFFICE

2,236,040

BRACE MEANS FOR PIVOTED CLOSURE

William H. Stryker, Elmhurst, Ill., assignor, by mesne assignments, to William H. Stryker and Emma G. Stryker, Elmhurst, Ill., as joint tenants

Application April 6, 1938, Serial No. 200,435

8 Claims. (Cl. 292—263)

This invention relates to improvements in brace means for pivoted closures, and more particularly to self-acting brace means for closures of the nature of doors, box lids, rumble seat covers, and substantially any type of closure commonly hinged along one side thereof, and which it might be desired to brace in open position, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

I am aware that in the past many and various types of collapsible brace means have been developed for holding a hinged closure in open position. Frequently, however, it is desirable to both open and close a hinged door or the like, have it braced while in open position, and still have one hand free for other duties. In other words, it is desirable to be able to both open the door and close the door, using only one hand for each operation. In all of the heretofore known brace constructions of which I am aware, it was necessary to use two hands, one to operate the closure member itself and the other hand to effect a releasing of the brace to move the closure into closed position, and in some instances it was also necessary to use the other hand to position the brace in operative position when the door was opened.

In addition, these formerly known brace constructions were frequently cumbersome, difficult to install neatly and inconspicuously, and in many cases involved a great number of parts with consequent expense in construction.

With the foregoing in mind, it is an important object of the present invention to provide brace means for a pivoted closure arranged for automatic movement into bracing position upon the opening of the closure, there being no adjustment necessary to cause the brace means to act upon the opening movement of the closure.

Another object of this invention is the provision of brace means for a pivoted closure which means may be controlled by the handle of the closure, the brace means automatically assuming bracing position upon an opening movement of the closure and being released by a normal movement of the closure handle.

A further object of the invention is the provision of brace means associated with a pivoted closure, which brace means are releasable upon a movement of the closure handle towards the shut position of the closure.

It is also an object of this invention to provide novel brace means for a pivoted door or the like, which brace means are responsive to a movement of the door handle to permit closing of the door, and which brace means automatically assume bracing position upon the opening of the door, without any interference with the ordinary latching means which may be associated for operation by the handle.

Still another object of the invention resides in the provision of brace means for a pivoted door or the like, which means effectively hold the door in open position and may be released when it is desired to close the door, the arrangement being such that only one hand is necessary to effect an opening or closing of the door.

The invention also contemplates the provision of brace means of the character set forth and claimed herein which are simple in construction, durable, economical, and which may be readily installed in an inconspicuous position.

While some of the more salient features, characteristics and advantages of the present invention have been above pointed out, others will become apparent from the following disclosures taken in conjunction with the accompanying drawings, in which:

Figure 1 is a fragmentary top plan view of a pivoted closure and adjacent structure, embodying improvements of the present invention;

Figure 2 is an enlarged fragmentary sectional view, taken substantially as indicated by the line II—II of Figure 1, but showing the door in open position and the brace means in elevation;

Figure 3 is a fragmentary plan sectional view, taken substantially as indicated by the staggered section line III—III of Figure 2, with the door in open position;

Figure 4 is a view similar in kind and location to Figure 3, but illustrating the door and brace means ready to be moved to closed position;

Figure 5 is an enlarged fragmentary sectional view, with parts in elevation, taken substantially as indicated by the section line V—V of Figure 1, showing the position of the brace means when the closure is shut;

Figure 6 is a fragmentary sectional view through the closure itself, illustrating the connection between the brace means and closure handle;

Figure 7 is a sectional view taken from the left of Figure 6, showing another view of the connection between the brace means and closure handle;

Figure 8 is a sectional view showing a closure in open position equipped with a modified structure of brace means embodying improvements of the present invention; and

Figure 9 is a fragmentary sectional view, taken substantially as indicated by the staggered section line IX—IX of Figure 8.

As shown on the drawings:

The illustrated embodiment of this invention is shown in connection with a jamb 10 of any suitable construction defining an opening which may be covered by a suitable closure 11, in this instance illustrated as a door hinged to the jamb as indicated at 12. It will be appreciated that the closure 11 may be in the form of a case lid, a French window, a trap door, a cover for a rumble seat deck, or substantially any form of closure which it may be desired to brace in open position.

The door may be provided with a depending flange 13 thereon, as seen plainly in Figure 2, or it may have any other suitable construction to conceal a connection between the door handle and the brace means to be later described herein. In this instance, the door is provided with a suitable form of handle 14 connected to a rotatable shank 15 carrying any desired latching medium, such as the member 16. Rotation of the handle together with the shank 15 moves the latching member to operative or inoperative position in the usual well-known manner.

It will also be noted, with reference to Figures 6 and 7, that the handle is connected to the shank 15 by a pivot pin 17, permitting the handle to pivot relatively to the shank, as indicated by the dotted lines in Figure 6. To one end of the handle, a Bowden wire 18 or the equivalent is connected, this wire being enclosed in a suitable sheath 19 which extends upwardly through the top of the door 11 adjacent the handle, along the underside of the door to which it may be secured in any suitable manner, and the other end of the wire is connected to the brace means in a manner to be later described. It is therefore apparent that the door handle 14 may be rotated to release the latching member without in any manner affecting the brace means. As will more fully appear later herein, the brace means automatically assume bracing position when the door is opened. When it is desired to close the door, the handle is pivoted downwardly, as indicated by the dotted lines in Figure 6, in the direction of the closing movement of the door, and a consequent pull upon the Bowden wire 18 effects a releasing of the brace means, permitting the door to be closed.

With reference to Figures 1, 3 and 4, it will be seen that the jamb 10 is provided with a groove or hollow 20 in which the major portion of the brace means rests when the door is in closed position. It will be appreciated that the door may have a suitable flange thereon to cover the hollow 20 when in closed position, such part not being illustrated for the purpose of clarity in showing the mechanism.

Referring to the structure shown in Figures 1 to 5, inclusive, it will be seen that the brace means includes a pair of links or arms 21 and 22. These arms are pivotally connected as at 23 near the adjacent ends thereof. However, it will be noted that the pivot connection 23 is not at the ends of the respective arms, but is spaced inwardly from the end of each of the arms. Adjacent the other end thereof, the link 22 is pivoted to the door 11, as indicated at 24. The opposite end of the link 21 is turned at an oblique angle from the remainder of the link, as indicated at 25, and this portion is pivotal on the shank of a screw 26 or equivalent securing element attached to the jamb 10 below the hollow 20. With this arrangement when the door is moved to the closed position seen in Figure 1, it will be seen that the arm 22 rests within the hollow 20 in the jamb, while the arm 21 is disposed thereadjacent. It will be noted that the pivotal connection 24 between the outer end of the arm 22 and the door 11 is in the nature of a hollow rivet or the equivalent, as seen clearly in Figures 3 and 4, which gives the adequate space for the arm 22 to overlie the arm 21 when the door is in closed position as seen in Figure 1.

A member 27, bent to define an oblique angle, is pivotally connected in a bracket 28 carried by the arm 22, as indicated at 29. At one end thereof, this member carries a pin 30, and on the opposite side of the pivot 29 a suitable leaf spring 31 may be disposed between the arm 22 and the member 27, tending to urge this member outwardly, so that the pin 30 is normally disposed inwardly in the position seen in Figure 3.

With reference more particularly to Figure 2, it will be seen that the outer end of the arm 21 is expanded, as indicated at 32, and provided with a plurality of apertures 33, in any one of which the pin 30 may engage to hold the arms relatively stiff and brace the door 11 in open position, as seen in Figure 2. The various apertures 33 provide means whereby the door may be held in various selective open positions.

The opposite end of the member 27 is loosely disposed around the shank of a headed pin 34 extending through the hollow rivet 24. The inner end of this pin is connected to the adjacent end of the aforesaid Bowden wire 18, as seen in Figures 1, 3 and 4.

The operation of the structure above described is extremely simple and positive. It is simply necessary to grasp the door handle 14, rotate the handle to release the latching member 16 and swing the door to open position. As the pin 30 carried by the inner end of the member 27 reaches the first aperture 33 in the arm 21, the spring 31 urges this pin into engagement with the aperture, thus locking the arms 21 and 22 in bracing position. This, of course, is automatically accomplished due to the opening movement of the door. If it is desired to have the door in farther opened position than permitted by the first aperture 33, it is a simple expedient to pivot the handle 14 as seen in Figure 6, thus causing the Bowden wire 18 to pull in the opposite end of the member 27 against the action of the spring 31 and thus release the pin 30 from engagement in the aperture 33. Immediately upon release of the pin, the door may be swung into further opened position, without holding the handle in its pivoted position, and the pin 30 will automatically engage in the next succeeding aperture 33.

When it is desired to move the door to closed position, it is simply necessary to press down on the handle 14, thus causing it to pivot, and thus releasing the brace mechanism permitting the door to be moved into closed position. It will be noted that in pressing the handle, the handle is pressed towards the closed position of the door or in the same direction the door is designed to move. It will also be appreciated that in the event the latching element 16 is not desired, it can very readily be eliminated, and in that event it is simply necessary to grasp the handle and move the door to open position without pivoting or turning the handle in any way whatsoever, the brace means automatically assuming bracing position. It is obvious that the entire actuation of

the door may be accomplished easily with only one hand of the operator, leaving the operator's other hand free for other duties.

In Figures 8 and 9, I have illustrated a somewhat modified form of construction wherein only a single arm brace member is used. The same control mechanism above described, namely, the Bowden wire 18 and its association with the door handle 14, are employed and function in the same manner.

A jamb 10 is provided and the same door 11 is hinged in the jamb as indicated at 12. The jamb is provided with a hollow 20a of somewhat different contour than the previously mentioned hollow 20, as seen best in Figure 8, and the inside portion of this hollow is closed by a plate 35 secured to the jamb.

A brace member of substantially the same character as the arm 22 above described is pivoted as indicated at 24 by means of a hollow rivet connection to the door 11, and at the other end carries a headed stud 36 slidable in a slot 37 in the plate 35. This brace arm has the member 27 pivoted thereto in the manner above described, this member carrying the pin 30 at one end thereof, and on the other side of the pivot point 29 the leaf spring 31 is disposed to constantly urge the pin inwardly. Through the pivot member 24, a headed pin 34 extends and the inner end of this pin is attached to the aforesaid Bowden wire 18, the operation of the member 27 being the same as above described.

Beneath the slot 37, the plate 35 is provided with a row of apertures 38, in any of which the pin 30 may engage to hold the door in open position. The operation of the door is substantially the same as previously described, in that it is simply necessary to move the door to open position, the arm 22 sliding along the slot 37 until the pin 30 engages in one of the openings 38. If it is desired to have the pin engage in the next succeeding opening, it is simply necessary to pivot the door handle 14, release the pin 30, and then open the door until the pin again falls into the succeeding aperture 38. To close the door, it is simply necessary to move the handle in the direction of the closing movement of the door, causing the handle to pivot and release the pin 30, and the brace arm 22 will follow the slot 37 in the reverse direction and eventually lie within the hollow 20a when the door is closed.

From the foregoing, it is apparent that I have provided novel brace means automatically assuming bracing position upon the opening of a closure with which they are associated, and connected to the handle of the closure so that the handle may merely be moved in the direction of closing to release the brace means. The door may thereupon be opened, braced in open position, and again closed upon release of the brace means by a simple movement of the door handle, only one hand of the operator being necessary to actuate the door at any time. It will be further appreciated that the brace means are simple in construction, positive in their action, durable, and may be economically manufactured and installed.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than is necessitated by the prior art.

I claim as my invention:

1. Brace mechanism for association with a door, including brace means associated with the door and arranged to lock in bracing position when the door is opened, a movable handle on said door, and control means connecting said brace means and said handle, said control means being constructed and arranged to unlock said brace means when said handle is moved in the direction of movement of said door to closed position.

2. Brace mechanism for association with a door, including automatically operable brace means associated with said door to hold the door in open position, a movable handle on said door, and control means connecting said handle and said brace means, said control means being constructed and arranged to release said brace means upon a movement of said handle in the direction said door must move to close.

3. Brace mechanism for association with a door, including brace means associated with said door, a handle movable relative to said door in the direction of movement thereof, and control means connected between said brace means and said handle, said control means being constructed and arranged to unlatch said brace means upon movement of said handle relative to said door in the intended direction of movement of the door.

4. Brace mechanism for association with a door, including brace means including a resiliently urged locking pin connected with said door, a handle on said door and movable relative thereto in two mutually perpendicular directions, and a tension member connecting said brace means and said handle to effect a release of said locking pin upon movement of said handle in one of said directions, said handle being movable in the other of said directions without affecting said brace means.

5. Brace means for association with a closure, including cooperating members arranged to automatically assume a locked bracing position when the closure is opened, a handle on said closure movable relative to said closure in direction of movement thereof, and releasing means connected between said members and said handle, said means being constructed and arranged to release said members from their locked position upon movement of said handle relative to said closure in closure closing direction.

6. In brace mechanism for association with a jamb having a recess and a pivotal door carrying an actuating handle, a plate for closing a side of the recess in the jamb and having a slot therein with a series of openings adjacent the slot, a brace member pivotally connectable to the door and carrying a member slidable in said slot, a resiliently urged detent on said member for selective engagement in said openings, and a tension member connectable between said brace member and the door handle to retract said detent and release the brace member upon actuation of the handle.

7. A latch and brace mechanism for a door, comprising a handle on said door rotatable in a plane parallel to said door and pivotal in a plane at an angle to said door, a latch constructed and arranged to be operated by rotation of said handle in said first plane, brace means arranged to automatically assume a locked bracing position upon opening said door, and releasing means for said brace connected between said brace means and said handle and constructed and arranged to be actuated by a pivotal movement of said handle in said second plane and in the direction said door must move to close.

8. A latch and brace mechanism for a door, comprising a latch movable to and from a posi-

tion for holding said door closed, a brace comprising a plurality of members movable relative to each other for permitting said door to open and close and lockable relative to each other for holding said door open, a handle on said door and movable relative thereto in two different ways, means interconnecting said latch and said handle for moving said latch only when said handle is moved in one of said ways, and means interconnecting said brace and said handle for locking and unlocking said brace members only when said handle is moved in the other of said ways.

WILLIAM H. STRYKER.