Oct. 25, 1955 L. FULLERTON 2,721,635

DOOR ASSEMBLY

Filed Feb. 16, 1953

Fig. 1.

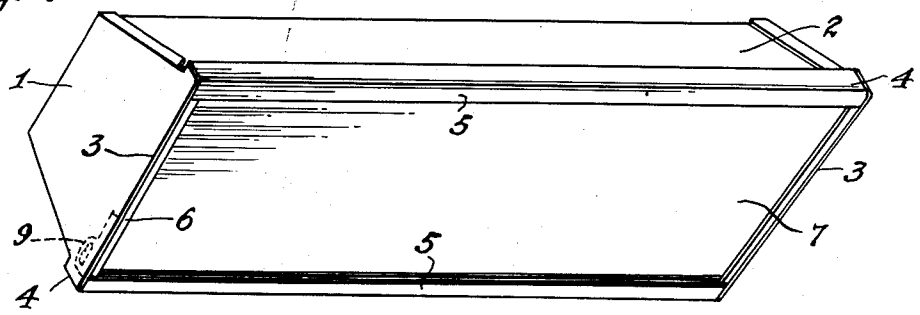


Fig. 2.

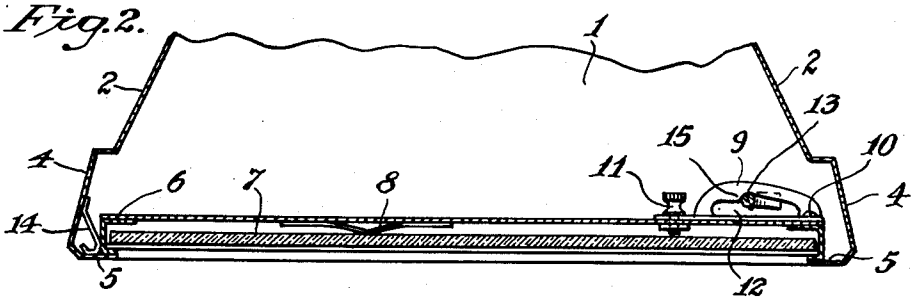


Fig. 3.

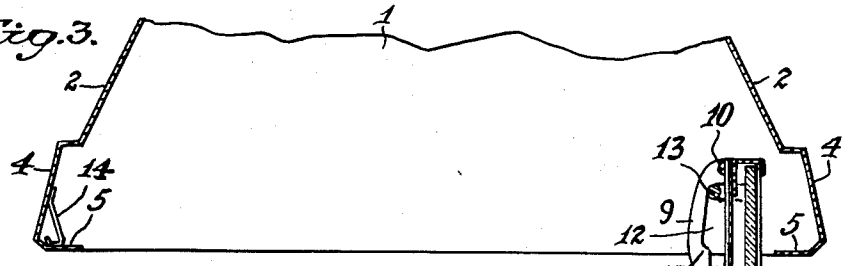


Fig. 4.

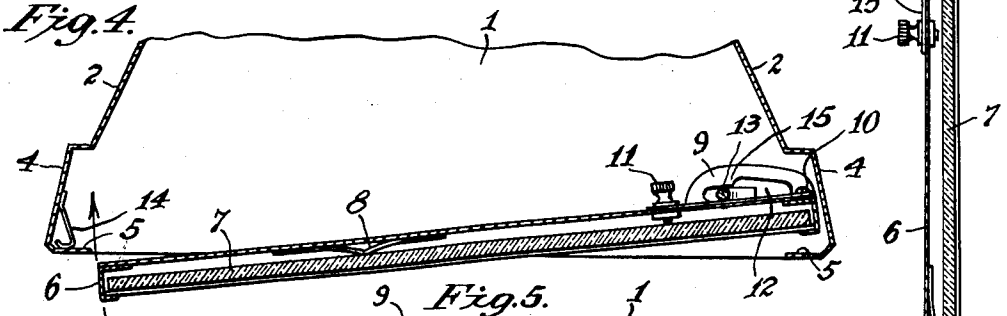
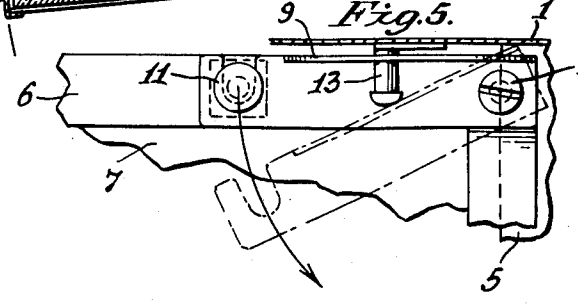


Fig. 5.



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United States Patent Office 2,721,635 Patented Oct. 25, 1955

2,721,635

DOOR ASSEMBLY

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Application February 16, 1953, Serial No. 337,015

1 Claim. (Cl. 189—46)

This invention relates to a door assembly developed particularly for use in connection with an overhead lighting fixture of the type having a horizontal door frame closed by a horizontal lens door. However, the invention may be used in connection with other devices and constructions requiring a door or window which must be mounted to swing open and shut.

The main object is to provide an assembly using concealed means for both hinging the door and locking or latching it closed. Another object is to attain the just stated object by the use of a construction which may be inexpensively manufactured and which will be easily operated, reliable in its operation, and have a long trouble-free service life.

In a lighting fixture of the overhead type having a horizontal door frame closed by a horizontal lens door, it has heretofore been customary to use exposed hinges or locks or latches or both, and the necessary lens door frame has been exposed beyond the inner periphery of the door frame so as to show a double frame construction. Therefore, a neat and compact appearance has been lacking and the permissible size of the lens has been reduced undesirably as compared to the size of the door frame. The present invention permits concealment of both the hinges and the necessary locks or latches, and the external appearance shows only a single frame. A larger lens may be used with a door frame of the same overall dimensions as would otherwise compel the use of a smaller lens.

Generally speaking, the invention comprises a door assembly including a door frame for which a door is provided, the door being biased to move away from the door frame. In a horizontal overhead door construction this bias is provided by the weight of the door. One edge portion of the door is connected to the door frame by means permitting both pivotal and edgewise movements of the door relative to the door frame. This results in the door's opposite edge portion swinging with the pivotal action. An abutment is provided at a location engaging the door's swinging edge portion when the door is closed, thus preventing outward swinging by providing what is in effect a lock or latch.

The above abutment may take the form of a ledge extending the length of the door and over which the corresponding part of a lens door's frame, for example, rests so as to be concealed. This abutment or ledge is further positioned to permit clearing therefrom by the door's swinging edge portion by shifting the door edgewise therefrom, thus effecting unlocking or unlatching permiting outward swinging of the door. The means for connecting the door to the door frame may be positioned above the door and by providing a second ledge opposite to the first for the door frame of the described lighting fixture, positioned so that the pivoted edge portion of the lens frame rests on it, this lens frame portion is concealed. The door frame's other two sides may be left free from ledges, and by providing door

frame ledges of the same widths as the lighting fixture's lens frame an effect of a single continuous lens frame results.

In the above construction the lens door is left resting on two opposed ledges against which it is forced by the opening bias on the door. The door may be prevented from shifting edgewise respecting the ledges by providing the ledge opposite to the one where the door is connected, with an abutment or the like preventing the door from shifting edgewise too far in that direction. To prevent inadvertent reverse shifting the means connecting the door to the door frame may be made to have a latching effect against such shifting, with release effected by slight inward movement of the door so as to permit the edgewise movement initially required to open the door.

A specific example of an overhead lighting fixture embodying the invention is illustrated by the accompanying drawings in which:

Fig. 1 is a perspective showing the fixture as it appears when looking upwardly at it;

Fig. 2 is a transverse section through the lower part of the fixture exposing the features embodying the present invention;

Fig. 3 is the same as Fig. 2 excepting that it shows the door open whereas the preceding figure showed the door closed;

Fig. 4 is the same as Fig. 2 excepting that it shows the door as it appears when partially opened or closed; and

Fig. 5 is a plan view showing a detail of the assembly.

This illustrated fixture includes a housing adapted to be suspended overhead, and to contain a lighting source such as incandescent lamp bulbs or fluorescent lamp tubes. This housing is defined by vertical end walls **1** and downwardly and outwardly slanting side walls **2**. The ends walls **1** continue downwardly to exposed bottom edges **3** which are inconspicuous because all of the walls are made of sheet metal, this making the edges **3** very narrow or thin. The bottom portions of the walls **2** are formed into channels **4** extending the length of the housing and through their bottom flanges forming two oppositely spaced horizontal ledges **5**. Thus the bottom of the housing defines a door frame formed by the edges **3** and ledges **5**.

The lens door is formed by a lens frame **6** made of channel members within which a lens **7** is retained and tightly positioned by springs **8**. One end of the lens frame may be left open so that if the lens is broken a replacement lens may be slid longitudinally into the lens frame. As shown in Fig. 2 the lens door rests on top of the ledges **5** gravitationally. As shown by Fig. 1 the result is that of a single frame surrounding the lens in so far as can be seen. In the illustrated fixtures the lens frame is slightly narrower than the bottom of the ledges **5**. If desired, the lens frame may be made wider so as to match in appearance the ledges **5**.

The means connecting the door to the door frame comprise brackets **9** connected to the lens frame **6** by fastenings **10** and **11**. These brackets are shaped to form guideways **12** spaced from the inner side of the lens frame and extending therealong transversely to the door's swinging edge portion. Pins **13** are connected to the door frame and are positioned to transversely engage these guideways **12**. In the illustrated example the pins **13** extend inwardly from the end walls **1**. The brackets and pins are shown at the right-hand edge of the lens door and by shifting the door to the right its left-hand edge portion is freed from the left-hand ledge so that the door may swing open. This shifting may be effected by exerting an appropriate shifting motion with the hands against the

bottom of the lens 7. The guideways 12 extend far enough in front of the pins 13 to permit the shifting required to unlock or unlatch the door so it may swing open. The guideways 12 extend far enough behind the pins so that as the door swings open, as shown by Fig. 4, it may be shifted towards the left so that its overhanging end is freed from the inside of the channel 4, thus permitting the door to swing fully open to the position shown by Fig. 3.

When the door is shut it is held with the sides of its lens frame 6 registered behind the ledges 5 in a positive manner. This is effected by the use of downwardly wedge shaped door edge abutments 14 connected to the left-hand one of the channels 4 and which prevents excessive movement of the door in that direction, working in cooperation with shoulders 15 formed in the guideways 12 between their ends by appropriate shaping of the brackets 9. These shoulders 15 drop around the pins 13 as the door is moved edgewise to its final closed position, the weight on the door then preventing it from shifting in the direction of the pins 13 away from the abutments 14. The brackets 12 are preferably shaped so that the portions of the guideways 12 behind the shoulders 15 are high enough to just slightly clear the pins 13, thus permitting the lens frame to rest on both of the ledges 5 so that no space between them can show. In the case of other applications it may be more desirable to let the guideways 12 rest on the pins 13 and thus support the door. The guideways decline smoothly behind the shoulders 15 so that the door may be moved easily from the Fig. 4 position to that shown by Fig. 3.

Preferably the brackets are secured to the door by making the fastening 10 function as a pivot and the fastening 11 in the form of a releasable thumb screw or the like. With this arrangement the thumb screw 11 may be loosened and the bracket swung away from the pin 13 as shown by Fig. 5, in the case of either or both of the brackets. Thus the door may be easily removed for replacement of the lens 7 if necessary, or for more thorough cleaning of the fixture.

In operation, the lighting fixture using the new door assembly has the neat appearance shown by Fig. 1. There is no double frame effect and neither hinges or locking devices are visible.

To open the door the palm of the hand is placed against the lens 7 so as to slightly lift the door, whereupon the door may be shifted toward the pivot pins 13 and thereafter permitted to swing downwardly to the Fig. 3 position. The closing of the door is equally a natural operation, the closing action almost automatically causing the door to shift edgewise to the Fig. 4 position as soon as it moves to a position where the lens frame clears the inner corners of the right-hand channel section 4 of the housing. When almost closed the door is slightly lifted to clear the shoulders 15 from the pins 13 and permit the swinging edge portion of the door to be moved up past the left-hand ledge 5, after which a reverse motion causes the shoulders 15 to ride over the pins 13 so that by merely dropping the door it rests squarely on the ledges 5. The wedge shaped abutments 14 guide the door to its final position.

The lens frame, or the corresponding frame of any door, may be made wider than the ledges 5 if desired. For example, a very heavy glass lens may require the strength of a rather wide frame. Even so, the door assembly retains an attractive appearance and, of course, it retains all of its described mechanical and structural advantages. It is to be understood that any kind of lens may be accommodated by the disclosed fixture. In addition to glass, any opaque or translucent or transparent elements may be used, if arranged to pass the light. Louvers of all kinds, screens, etc. are considered to be either a lens or its equivalent when used in connection with the door assembly of the fixture disclosed hereinabove. In other kinds of door assemblies the door may be any kind of panel whether framed or not, and it may be of solid construction if desired.

I claim:

A door assembly including a door frame, a door for the door frame and which is biased to move away therefrom, means for connecting one edge portion of the door to the door frame for both pivotal and edgewise movements relative to the door frame, the door's opposite edge portion swinging upon pivotal movement of the first-named edge portion, and an abutment positioned to engage the door's swinging edge portion when the door is closed in the door frame, whereby to prevent outward swinging of the door's swinging edge portion, and positioned to permit clearing from the abutment by the door's swinging edge portion by shifting the door edgewise therefrom, whereby to permit outward swinging of the door's swinging edge portion, said means comprising brackets connected to the door and forming guideways spaced from the door's inner side and extending therealong transversely to the door's first-named edge portion, and pins connected to the door frame and positioned to transversely engage the guideways, the brackets further forming shoulders for the guideways which shoulders are positioned to engage the pins when the door's swinging edge portion is engaged by the abutment when the door is closed, the guideways being spaced from the door's inner side far enough to permit the door's first-named edge portion to be pushed against the door's bias to release the shoulders from the pins, the assembly including a housing for the door's first-named edge portion and which defines a space therebehind insufficient to provide clearance for this portion when pivoting after the edgewise shifting of the door away from the abutment and the guideways extending in the direction of this space far enough from the shoulders to permit edgewise movement of the door away from this space to provide clearance for the first-named edge portion after the door's swinging edge portion is free from the abutment, and means for limiting edgewise shifting of the door towards the abutment far enough to space the shoulders materially from the pins when the door is closed, at least one of the brackets being pivotally connected to the door for swinging in a direction releasing this bracket's guideway from its pin, and releasable means for locking this one of the brackets in operative position respecting its pin.

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