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3,475,863

SHUTTER WINDOW WITH AN ELASTIC ELEMENT FOR
HOLDING AND RETAINING THE PLATE

Filed Oct. 24, 1967

2 Sheets-Sheet 1

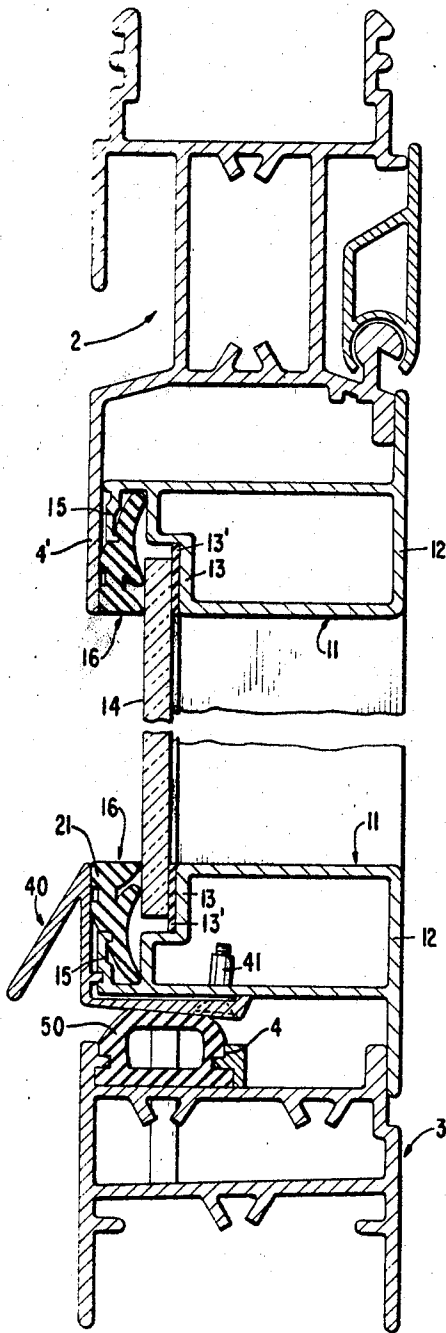


FIG 3

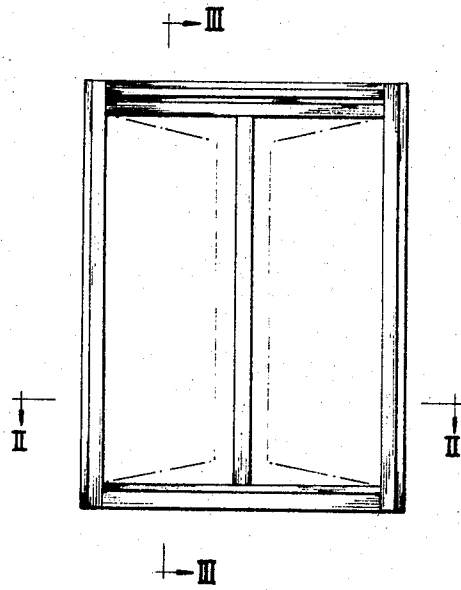


FIG 1

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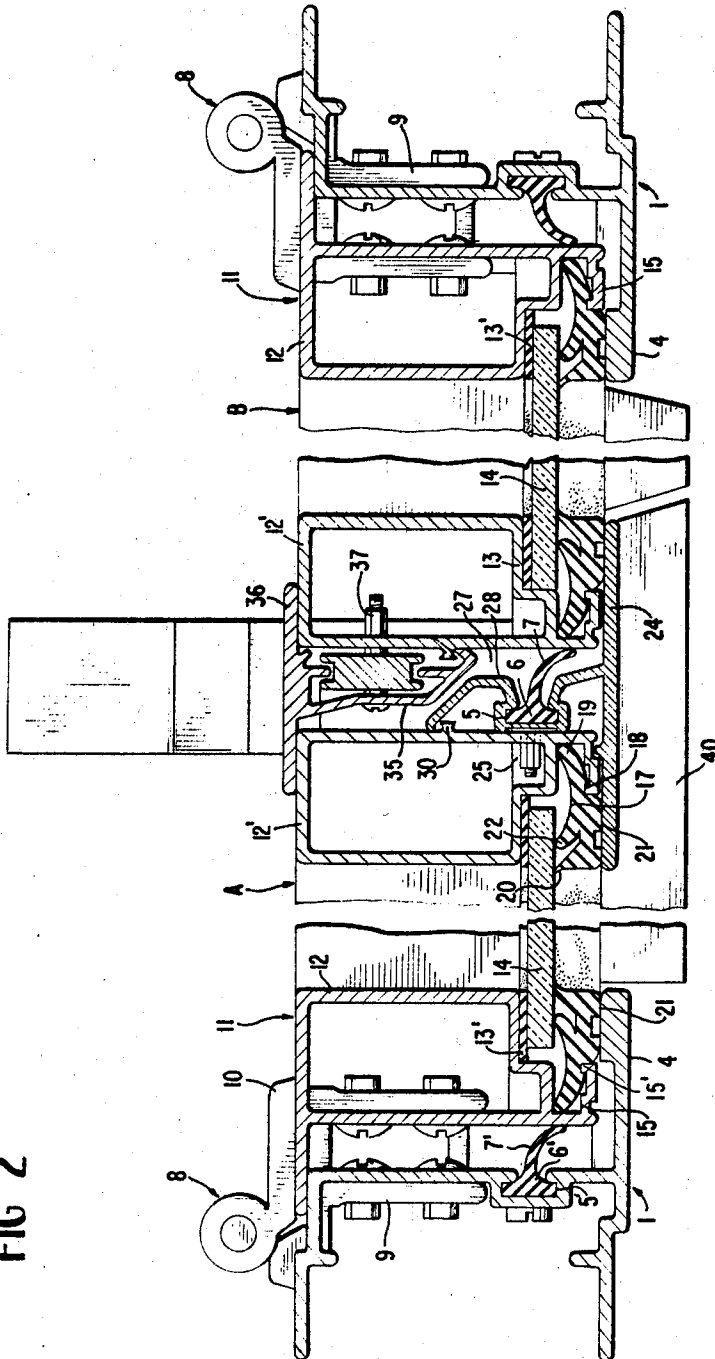
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FIG 2



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**SHUTTER WINDOW WITH AN ELASTIC ELEMENT
FOR HOLDING AND RETAINING THE PLATE**

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7 Claims

ABSTRACT OF THE DISCLOSURE

A shutter window wherein an annular seal is provided for simultaneously holding the glass pane in the mobile frame and providing sealing contact with the stationary frame part of the window in the closed position thereof, and including cover members having extension parts projecting into the space between the windows in the closed position thereof to form a sinuous path therethrough and additional resilient members extending between the inner circumferential surfaces of the stationary frame part and the outer circumferential surfaces of the mobile windows to form a seal therebetween.

The present invention relates in general to an improved shutter-type window having improved insulating qualities.

In metal frame casement-type or shutter-type windows, problems relating to the proper sealing of the window against passage of outside elements, such as rain, snow, wind, etc., has been a serious problem to which great efforts have been directed; however, little enough attention has been paid to the prevention of transmission of other undesirable elements by way of these windows, such as heat and noise. Known window constructions of this type generally provide for an abutting of metal parts between the inside and the outside metal frame members in the closed position of the window, thereby providing an excellent path for both sound coming from outside of the window and for heat passing through the window from the inside to the outside.

It is therefore a primary object of the present invention to provide a shutter window, of the type constructed by use of a plurality of metal sections or channels, for example, of aluminum and its alloys, wherein the path through which such elements as heat and sound must pass between the inside and the outside of a room including the window is reduced to an absolute minimum or negligible value.

It is another object of the present invention to provide a shutter window construction of the type described wherein the area of metal-to-metal contact between the movable window portion and the stationary frame portion consists of only a small fraction of the window circumference.

Still another object of the present invention is the provision of a shutter window construction of the type described wherein the glass panes are elastically retained in their seats so as to substantially reduce the acoustical transmission between the panes and the adjoining frames.

Still another object of the present invention is to provide a shutter window which is agreeable in appearance, free of inconvenient discontinuities, and of sufficiently simple construction to provide for economical manufacture and repair.

In order to achieve the aforesaid objects of the invention, in addition to those which will be more readily apparent from the following detailed specification, the invention proposes a shutter window construction essentially characterized by the fact that at least one of the

mobile sashes thereof provides along its outwardly directed contour a housing for an annular elastic seal and glazing strip having a first portion elastically retaining the glass pane along the contour of the sash and a second part reducing or effectively eliminating any direct contact between the metal parts of the movable portion of the window and the metal parts of the relatively stationary frame portion of the window.

The present invention will be better understood with reference to the following detailed description thereof given only by way of example and carried out with reference to the accompanying drawings, wherein:

FIGURE 1 shows a front view of the window construction in accordance with the present invention;

FIGURE 2 shows a section taken along line II—II of FIGURE 1; and

FIGURE 3 shows a section taken along line III—III of FIGURE 1.

Referring generally to the drawings, FIGURE 1 provides a general perspective view of one exemplary embodiment of the present invention in the form of a double shutter or casement-type window including a pair of generally vertically disposed stationary side frames interconnecting with upper and lower horizontal frames. In FIGURES 2 and 3, the reference numerals 1, 2 and 3 represent in general the frame members designed to be fixed in any known manner to the supporting structure for the window, such as a wall, wherein the window opening is desired.

Referring now more particularly to FIGURE 2, the mobile sash provided for each of the windows A and B, is realized by means of interconnecting channel sections which, except for minor variations, are provided of essentially identical cross-section. In particular, the mobile frames 11 are comprised of box-like channel members 12 and 12', each provided with a step 13 against which the glass pane 14 is supported by means of a generally annular elastic seal and glazing strip 16. The channel members 12 and 12' are each provided with an extension 15 which serves to secure the annular seal 16 to the channel member and retain it in contact with the glass pane 14 in the manner to be described more fully hereinafter. There is also interposed between the window pane 14 and the step 13 on the channel members 12 and 12' a generally elastic washer-like seal 13', which provides a resilient seat against the step 13 for the glass pane.

More particularly, along the contour of the window which faces to the outside, frames 11 define a continuous seating constituted by a projection 15 forming a housing wherein an annular elastic seal 16 is housed, said seal fulfilling a series of important functions including the resilient retention of the glass pane 14, the prevention of dust and water from infiltrating past the window, and the elimination of a direct contact between metal parts forming respectively, the inside and outside portions of the window. The seal 16 is provided of a special cross-sectional configuration so as to accomplish all of these objectives with maximum efficiency. In particular, the seal 16 provides a concave portion 17 extending into a pair of fingers 19 and 22 which are resiliently urged against the inner wall formed by the projection 15 and the outside surface of the window pane 14, respectively. The finger 22 along with an outer border seal portion 20, urged against the surface of the window pane 14, serves to press the window pane against the resilient member 13' supported on the step 13 of the channel sections. Due to the concave contour of the portion 17, the fingers 19 and 22 provide a lever action against the surface of the window pane with the pivot therefore being provided by a continuous tooth 15' formed on the projection 15, which tooth penetrates an annular groove 18 in the seal

16. In addition, the seal 16 provides a relatively flat head portion 21 which is pressed against the metal extension 4 of the stationary window frame at the outside portion of the window thereby providing a resilient seal between the frame and the window, when the window is closed.

The portion of the seal 16 associated with the vertical channel member 12; at the extremity of the mobile window contacts with its flat head portion 21 a protective outer cover plate 24, provided with an extension 28 by which the cover plate 24 is secured by bolts 25 or the like to the channel member 12'. The extension 28 provides a longitudinal channel 5 which carries a sealing head 6 having a resilient elastic lip 7 which is pressed against the rear surface portion of the channel section 12' of the other window to provide an effective seal between the two windows preventing entry of outside elements by way of the space therebetween. The extension 28 passes beyond the longitudinal channel 5 reaching a tooth 30 on the channel member 12' of the movable window to which the cover plate 24 is secured.

The intervening space 27 between channels 12' on the respective windows is closed at the inside portion of the window by a closure arrangement including a flat cover plate 36 having a part 35 extending inwardly into the space 27 in such a way as to form in conjunction with the extension 28 of the cover plate 24 a sinuous course, which materially restricts the passage of heat from the inside or undesirable elements from the outside. The cover plate 36 is secured to the channel member 12' of the window by means of screws 37, or other suitable fastening means passing through the extension part 35.

The windows are suspended from the stationary window frame by means of suitable hinges 8 providing wings 9 fixed to the frame members 1 and a pivotable wing 10 secured to the channel member 12 of the individual windows. A seal between the fixed frame portion and the channel section 12 of the window is provided by means of a sealing head 6' secured in a channel 5' formed in the frame member 1, which sealing head 6' is provided with a resilient elastic lip 7' extending into contact with the opposing surface of the channel section 12, being substantially identical to the sealing arrangement provided in the extension 28 of cover plate 24.

FIGURE 3 illustrates a vertical section through the window illustrating in cross section the upper and lower horizontal frame members 2 and 3. The lower frame member 3 is provided with a housing portion 4 which accommodates an elastic packing 50 designed to provide a seal on the lower side of the mobile sash in contact with a baffle 40. The baffle 40 is secured to the lower channel member 12 of the mobile window by means of suitable fastening devices such as 41. The flat head portion 21 of the annular seal 16 abuts against the rear surface of the baffle 40 providing for a complete seal of the window pane 14 from external elements. The frame member 2 provides an outside flange 4' designed to form a shoulder for the mobile window similar to the extension 4 provided by the frame members 1, as seen in FIGURE 2. It is noted, however, that contact between the movable window and the projecting portions 4 and 4' is effected entirely through the elastic seal 16.

As is apparent from the figures, the path through which the heat is transmitted by conduction from the outside past the window to the inside is reduced to an absolute minimum as the metal-to-metal contact between inner and outer elements of the window is limited as a result of the presence of seal 16. Thus, not only is a complete seal provided for the window against the passage of undesirable elements, such as rain, snow and wind, but the heat conducting path from the outside surface to the inside surface is restricted to passage through the resilient sealing members 16 and 50, which are poor conductors of heat, so that an effective interruption of the path limiting the amount of heat transfer possible between the two surfaces is accomplished.

I have shown and described one embodiment in accordance with the present invention. It is understood that the same is not limited thereto but is susceptible of numerous changes and modifications as known to a person skilled in the art and I, therefore, do not wish to be limited to the details shown and described herein, but intend to cover all such changes and modifications as are encompassed by the scope of the appended claims.

What is claimed is:

1. A shutter window forming a barrier between an outside and an inside space comprising a stationary frame and at least one mobile window including a movable frame of basically rectangular cross-section pivotally secured to said stationary frame in a common plane for movement in the direction of said inside space, a glass pane mounted on an annular insulating gasket against the surface of said movable frame facing said outside space, an annular resilient seal and glazing strip supported in pressing engagement with said movable frame and said glass pane serving as the sole means for support of said glass pane against said movable frame, and a substantially L-shaped annular extension outstanding from said movable frame and forming an annular channel therewith adjacent the edges of said glass pane, said resilient seal and glazing strip including an arcuate portion having a first finger engaging said movable frame within said annular channel and a second oppositely directed finger pressing resiliently against said glass pane, said arcuate portion being supported on the back convex surface thereof on the free end of said annular extension so as to be retained in a slightly deformed position in engagement with said movable frame and said glass pane, said resilient seal and glazing strip also including a head portion forming a second seal with said glass pane and extending out therefrom beyond said annular extension, said stationary frame having a lateral extension projecting over a portion of the outer side of said movable frame and into contact with said head portion in the closed position of said window.

2. A shutter window as defined in claim 1 including at least a pair of mobile windows pivotally secured within said stationary frame, each said window including a movable frame, a glass pane and an annular resilient seal and glazing strip supported on said movable frame in pressing engagement with said glass pane and serving as the sole means for supporting said glass pane against said movable frame.

3. A shutter window as defined in claim 2 wherein a cover member is secured to each movable frame of said pair of windows along a portion thereof opposite to the portion pivotally secured to said stationary frame, each cover being secured to one mobile window for overlapping the other mobile window on a respective side thereof in the closed position of said windows.

4. A shutter window as defined in claim 3 wherein each cover member includes an extension member projecting into the space formed between said windows in the closed position thereof to form a sinuous path through said space from one cover member to the other.

5. A shutter window as defined in claim 4 further including a second resilient member secured along said opposite portion of the movable frame of one of said mobile windows so as to extend between said windows in the closed position thereof.

6. A shutter window as defined in claim 5 further including a first resilient member secured to the portion of said stationary frame to which said mobile windows are pivotally secured so as to extend to a movable frame in the closed position of said windows.

7. A shutter window as defined in claim 1 further including a baffle member secured to one portion of said movable frame and a resilient sill member secured to said stationary frame along a portion thereof and engaging said baffle member in the closed position of said window,

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said baffle member extending along the lowermost portion
of said mobile window.

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2,716,447 8/1955 Adams et al. ----- 49—488 XR
3,020,605 2/1962 Lemme ----- 52—502 XR

References Cited

UNITED STATES PATENTS

1,726,186 8/1929 Lane ----- 49—368
2,077,807 4/1937 Peremi et al. ----- 49—368

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KENNETH DOWNEY, Primary Examiner

U.S. Cl. X.R.

49—401, 485, 488, 489