

Oct. 1, 1935.

J. H. FOX ET AL

2,015,789

DOUBLE GLAZED WINDOW CONSTRUCTION

Filed Aug. 2, 1934

3 Sheets-Sheet 1

Fig. 1.

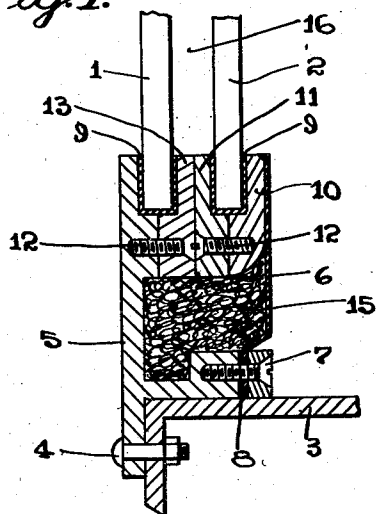


Fig. 2.

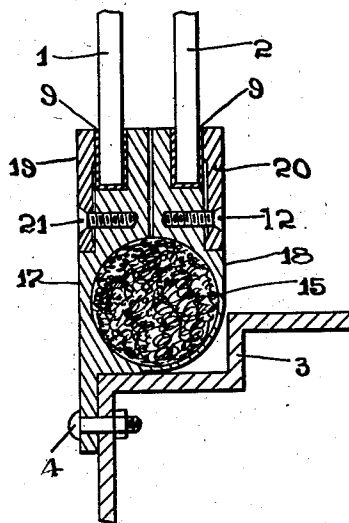


Fig. 4.

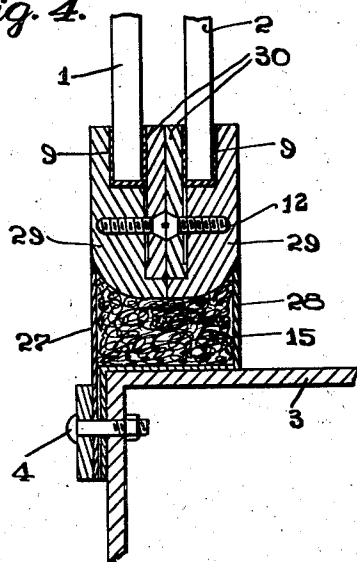
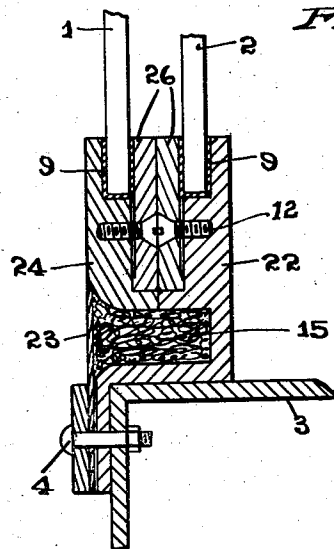


Fig. 3.



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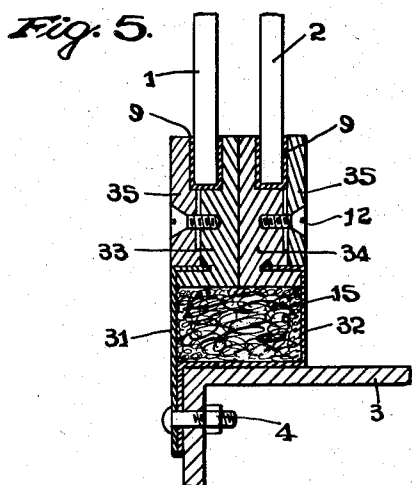
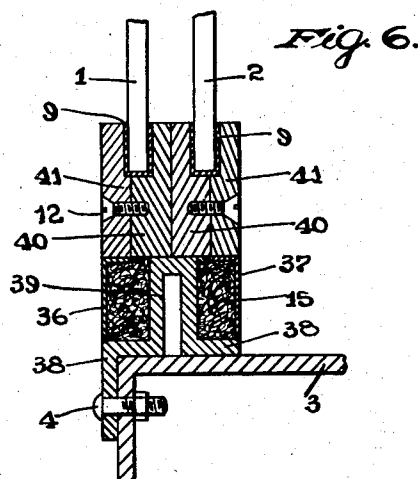
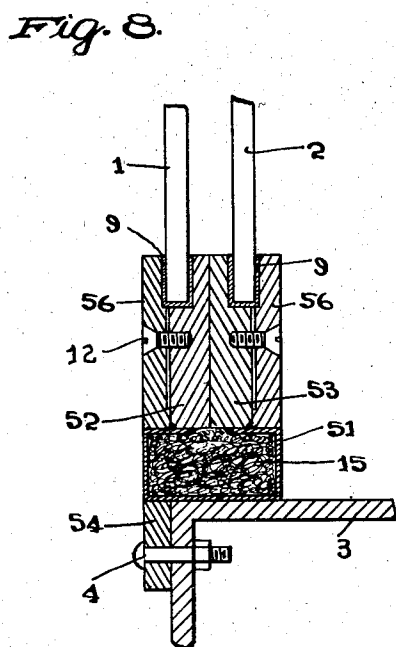
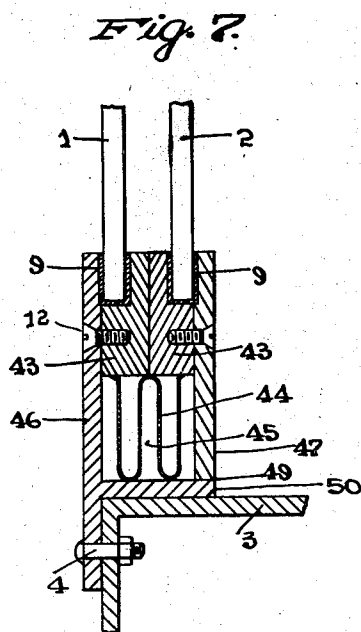
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DOUBLE GLAZED WINDOW CONSTRUCTION

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DOUBLE GLAZED WINDOW CONSTRUCTION

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3 Sheets-Sheet 3

Fig. 9.

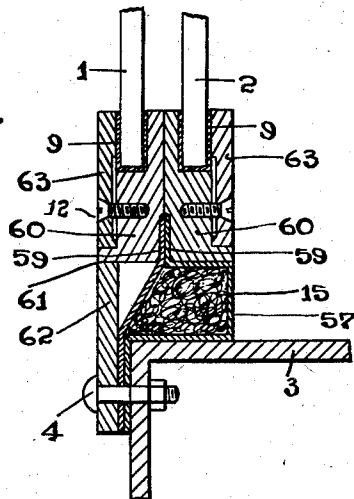


Fig. 10.

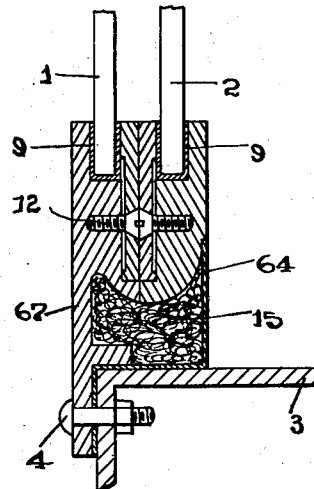
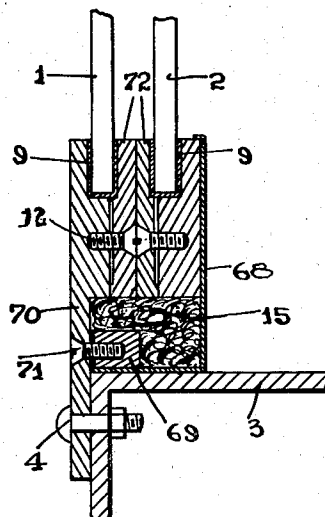


Fig. 11.



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UNITED STATES PATENT OFFICE

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DOUBLE GLAZED WINDOW CONSTRUCTION

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Application August 2, 1934, Serial No. 738,104

4 Claims. (Cl. 20—56.5)

The invention relates to a double glazed window construction designed particularly for use in car windows. In such constructions, it is desirable to fill the space between the glass sheets with dry air and then tightly seal off such space from the outer atmosphere in order to avoid condensation on the inner faces of the sheets and to prevent efflorescence (collection of white alkaline dust upon the inner faces of the sheets). Under these conditions considerable strain is placed on the sheets if the cars are sent over elevations of 8000 feet or upwards, due to the reduced air pressure on the outer sides of the sheets, and the present invention is designed to provide improved means for reducing the strain upon the glass when such condition is encountered so that any danger of breakage due to this cause is avoided. A further object of the invention is the provision of a simple construction permitting the ready removal and replacement of either of the glass sheets in case of breakage, or in case it should become necessary to clean the inner faces of the sheets. Certain embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figures 1 to 11 are sections through the lower portion of various sash constructions embodying the invention, it being understood that the construction at the sides and top of the window is similar to that at the bottom of the window.

Referring to Fig. 1, the numerals 1 and 2 indicate the glass sheets, and 3 is a portion of the car construction to which the sash is removably secured by means of the bolts 4 or other suitable fastening devices. The sash is made up of an outer wall 5 of relatively rigid construction and an inner wall 7 of relatively light sheet metal, permitting it to be readily sprung outward for the purpose hereinafter set forth. These walls may be in one piece extending on all four sides of the window or may be in four sections depending upon conditions, the one piece construction being preferred. The wall 6 is preferably secured releasably to the wall 5 by means of the screws 7, a suitable sealing material being provided at 8 in order to make a tight joint. At the inner edges of the members 5 and 6 supports are provided with grooves in which the edges of the glass sheets are seated, and in order to provide a tight joint between the metal and the glass, U-shaped sealing members 9, 9 of rubber composition are provided which perform the additional function of cushioning the glass sheets. The wall 6 has welded to its upper edge for receiving the glass, the strip 10, and in opposition to this strip, is a

clamping plate 11 secured in position by means of the screws 12. When the screws are tightened, clamping pressure is applied to the rubber sealing member 9, thus insuring a tight joint. The inner edge of the glass sheet 1 is similarly engaged by a clamping plate 13 held in position by means of the screws 12.

It will be seen that the construction as above described provides a space 15 which is sealed off from the atmosphere and a space 16 between the glass sheets which is similarly sealed off from the outer atmosphere. If the parts are properly sealed, therefore, the dry air which is supplied to the sealed off portions of the construction will remain in this condition, and as a result, condensation is avoided upon the inner sides of the glass sheets and also the formation of the white dust which commonly appears upon the inner surfaces of glass sheets in a double glazed construction, and is due in part to the presence of moisture in an atmosphere. When the car passes over a high elevation, resulting in reduced pressure on the outer sides of the glass sheets, the air between the sheets will expand and tend to bulge the glass, but any danger of breaking the glass under these conditions is avoided due to the support of the sheet 2 upon the relatively flexible wall 6, permitting the edge of this sheet 2 to spring out slightly, thus increasing the space between the sheets. This opens communication between the space 16 and the space 15, but the condition of the air between the glass sheets remains the same as far as moisture is concerned, since the space 15 is sealed off from the outer atmosphere. In order to reduce the volume of air subject to expansion, the space 15 is preferably filled with some light material, such as a pressed composition of wood, pulp paper, or the like, which is shaped to fit the contour of the space.

Fig. 2 illustrates a modification in which the walls 17 and 18 of the sash are integral and the space 19 is circular in cross section. The wall 18 is relatively thin and light to permit a spring action, so that it corresponds in function to the action of the wall 6 of the Fig. 1 construction. In this form of device, the inner walls of the grooves in which the glass sheets are seated are integral with the sash framing and the outer walls 19 and 20 are removable, being held in clamping position by means of the screws 12. As in the first form of construction, the space 15 is preferably provided with a filler of wood or other material which performs the function of reducing the volume of the space.

Fig. 3 shows a construction in which the heavy

wall 22 of the sash is located on the inner side of the construction and the thin flexible wall 23 on the outer side thereof. The wall 23 has the bar member 24 welded to its upper edge and sealing means are used at 25 in order to make a tight joint. The clamping plates 26, 26 are in this instance on the inner sides of the glass sheets, and are held by the screws 12, 12 as in the Fig. 1 construction.

In the modification illustrated in Fig. 4, the walls 27 and 28 are both somewhat flexible, and each has welded at its upper end a bar member 29, in which the edge of the glass sheet is mounted, the inner edges of the glass sheets being secured by means of the clamping plates 30, 30.

In the construction of Fig. 5, the walls 31 and 32 are both flexible and carry at their upper ends the bar members 33 and 34 grooved to receive the edges of the glass sheets, such sheets being clamped by means of the plates 35, 35. In this case, the upper edges of the wall members 31 and 32 are turned inward at right angles and fit into grooves in the members 33 and 34, being welded in such position.

In the construction of Fig. 6, the side walls 36 and 37 are welded to the base member 38 at their edges, and such base member is provided with a central rib 39 which supports the bars 40, 40 to which the upper edges of the plates 36 and 37 are welded. The glass sheets are clamped by means of the plates 41, 41 held in position by the screws 12.

In the Fig. 7 construction, the bars 43, 43 which support the edges of the glass sheets are welded to the upper edges of the spring member 44, and such spring member is carried in the space 45 between the walls 46 and 47, the wall 46 being bolted to the car frame member 3. In this construction, the plates 46 and 47 are clamping members. The plate 47 rests slidingly at 49 upon the flange 50 of the member 46, so that in this construction, as in those heretofore described, the member 47 is free to move to the right when pressure between the glass sheets is greater than that on their outer surfaces.

In the construction of Fig. 8, the necessary flexibility in the construction is provided by the side walls of the sheet metal box 51, such box being welded to the members 52 and 53 and to the flange 54 which is bolted to the car frame member 3. The glass sheets are clamped in position by means of the side plates 56.

Fig. 9 illustrates a box construction for giving the necessary flexibility, such box 57 resting upon the car frame member 3 and being provided with a pair of flanges 59, 59, which are welded to the bar members 60, 60 which carry the glass sheets. Sliding contact is provided at 61 between the outer bar member 60 and the plate 62, which is bolted to the member 58. The glass sheets are clamped in position by means of the plates 63, 63.

The construction of Fig. 10 is similar to that of Fig. 1, the primary difference being in the construction of the flexible wall member 64, which rests upon the car frame member 3, and has its edge bent down along the vertical side of such member, so that the bolts 4 serve to

clamp both the side wall member 64 and the side wall member 67. In other respects the construction is similar to that of Fig. 1.

In the construction of Fig. 11, the flexible wall member 68 is welded at its lower edge to the strip 69, and the side wall member 70 is secured thereto by means of the screws 71, sealing means being provided between the face of the strip and the wall member 70. The glass sheets are clamped by means of the plates 72.

What we claim is:

1. In combination in a window construction, a metal sash comprising a pair of opposing walls with a space therebetween sealed off from the atmosphere, one of which walls is of flexible construction so that it may be sprung toward and from the other wall, a glass receiving groove being provided at the inner edge of each of said walls, and a glass sheet seated in each of said grooves with its edge sealed therein, so that the space between the sheets may communicate with the space between the walls, but is sealed off from the atmosphere.

2. In combination in a window construction, a metal sash comprising a pair of opposing walls with a space therebetween sealed off from the atmosphere, one of which walls is of flexible construction so that it may be sprung toward and from the other wall, a filler of light material in said space, a glass receiving groove being provided at the inner edge of each of said walls, and a glass sheet seated in each of said grooves with its edge sealed therein, so that the space between the sheets may communicate with the space between the walls, but is sealed off from the atmosphere.

3. In combination in a window construction, a metal sash comprising a pair of opposing walls with a space therebetween sealed off from the atmosphere, one of which walls is of flexible construction so that it may be sprung toward and from the other wall, a glass receiving groove being provided at the inner edge of each of said walls, a sealing member of rubber composition U-shaped in cross section seated in each groove, and a glass sheet having its edge seated in each of said sealing members, so that the space between the sheets may communicate with the space between the walls, but is sealed off from the atmosphere.

4. In combination in a window construction, a metal sash comprising a pair of opposing walls with a space therebetween sealed off from the atmosphere, one of which walls is of flexible construction so that it may be sprung toward and from the other wall, a glass holding groove at the inner edge of each of said walls, said groove having one of its side walls in each case in the form of a removable clamping plate, a sealing member of rubber composition U-shaped in cross section seated in each groove, a glass sheet having its edge seated in each of said sealing members, and screw means for securing the clamping plates in position and applying pressure to the sides of the U-shaped sealing members, said space between the walls being in communication with the space between the glass sheets.

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