Aug. 15, 1939. C. E. STROUD 2,169,713

DOUBLE WINDOW CONSTRUCTION

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Fig. 1.

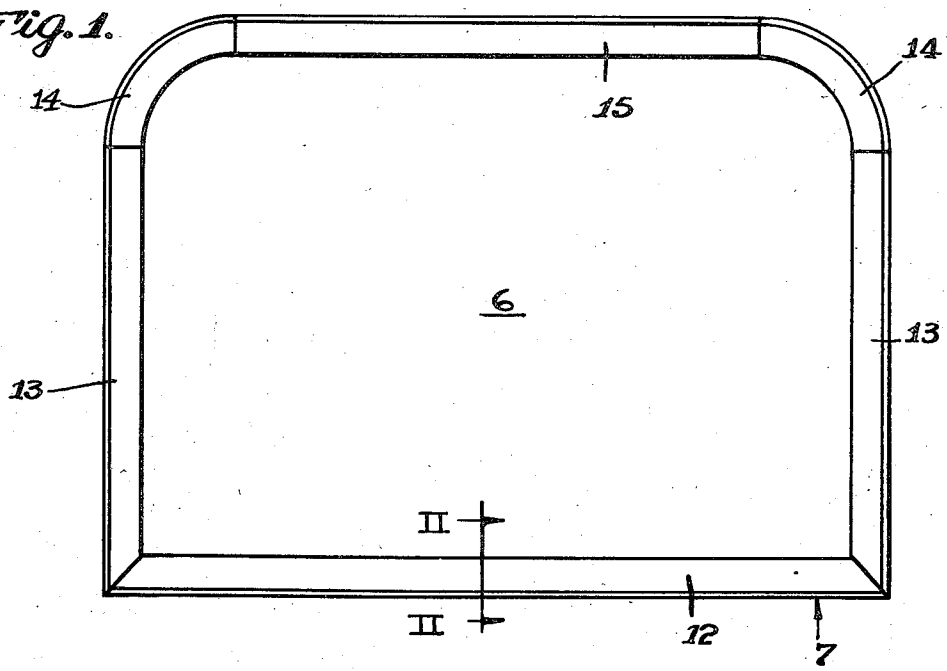



Fig. 4.

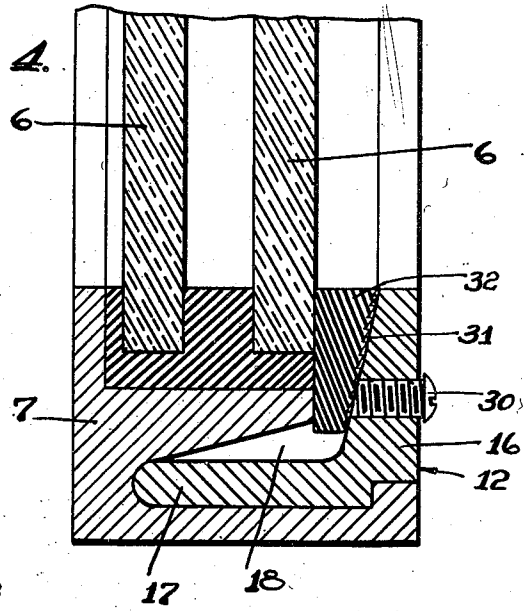
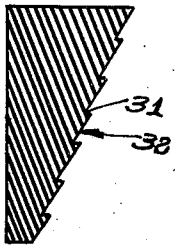



Fig. 5.




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Fig. 2.

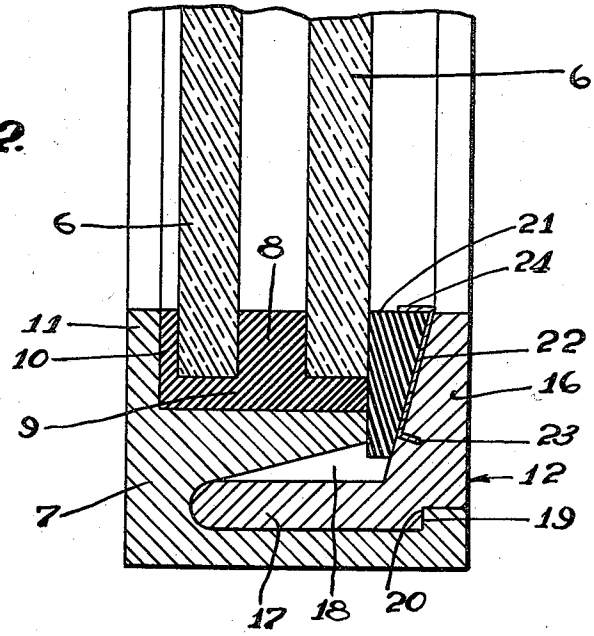
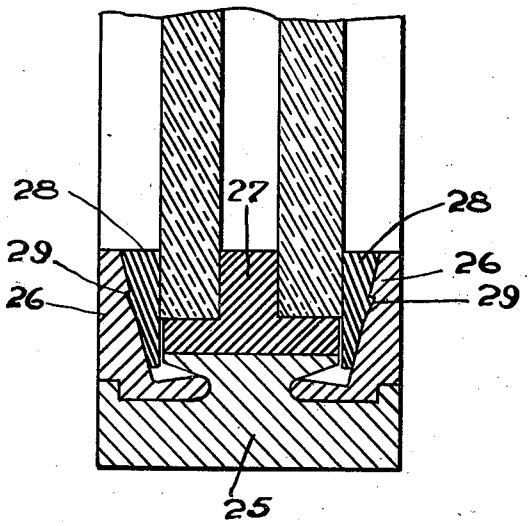



Fig. 3.




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Fig. 6.

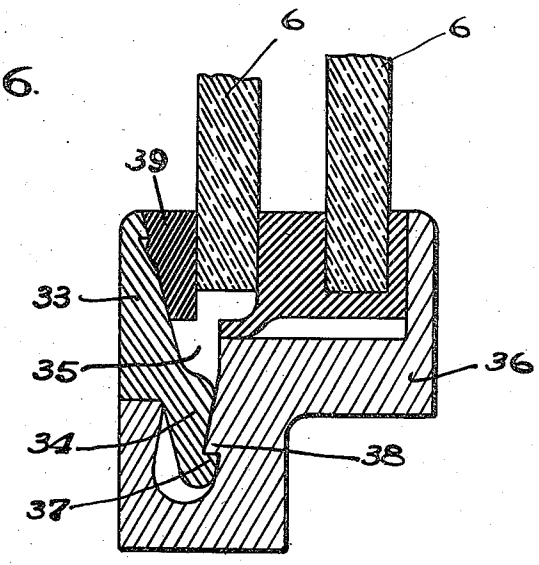



Fig. 7.

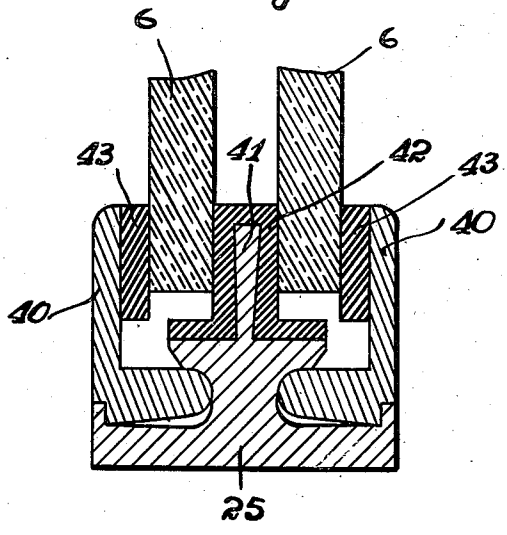
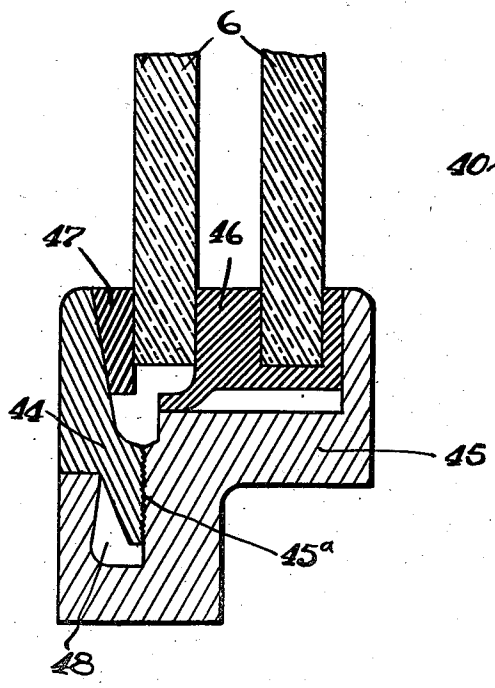



Fig. 8.




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# UNITED STATES PATENT OFFICE

2,169,713

## DOUBLE WINDOW CONSTRUCTION

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Application June 17, 1937, Serial No. 148,687

5 Claims. (Cl. 20—56.5)

The invention relates to a double window construction involving the use of two spaced panes of glass with the space between the sheets sealed against communication with the atmosphere. The invention has for one of its objects the provision of an improved construction in which the glass sheets are securely held in their frame and sealed, but are at the same time readily removable for replacement and for cleaning to remove any deposit of alkaline dust or stain on the inner surfaces of the sheets. A further object is the provision of a construction of the kind specified which does not require the use of screws to place the sealing spacer under compression and hold the parts in assembled relation, and which is of relatively cheap, simple construction. Certain embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figure 1 is a front elevation. Fig. 2 is a section on an enlarged scale on the line II—II of Fig. 1. Figs. 3 and 4 are sections showing modifications. Fig. 5 is a section through the wedge used in the window construction of Fig 4. And Figs. 6, 7 and 8 are sections showing further modifications.

Referring to Figs. 1 and 2, 6, 6 are a pair of glass sheets in spaced relation, and 7 is a metal frame which surrounds and carries the glass sheets. The edges of the glass sheets are mounted in a spacing and sealing means of yielding material, such as rubber, and comprises the spacer 8, the base portion 9, and the edge portion 10. The outer side of the frame is provided with a ledge member 11 which opposes the edge of the sheet 6 and the spacer 8.

The sheets are held in assembled relation by means of a plurality of ledge members 12, 13, 13, 14, 14 and 15, which are all of the cross sections shown in Fig. 2. These members are of metal and each comprise a flange 16 and a base 17 extending transversely of the flange and seated in the recess 18 of the frame. The ledge members are held against outward movement by means of the interlocking shoulders 19 and 20 formed in the frame and on the ledge members respectively.

The parts are preferably held in assembled relation by means of a wedge 21 which may be of yielding resilient material, such as rubber. The wedge may be a single strip extending clear around the window or it may be made in a plurality of sections. The wedge is of such thickness that considerable force is required to press it into position, so that when in such position, it is under compression and places the spacer 8 under compression. This is necessary in order to insure a proper seal between the spacer and the glass sheets and in order to maintain the parts securely in assembled relation. In order to lock the wedge against any possibility of accidental displacement, thin metal clips 22 are provided. These clips fit at their lower ends into slots 23 in the flanges 16 and at their upper edges are bent over the top of the wedge, as indicated at 24.

In order to disassemble a window for the purpose of cleaning the inner faces of the sheet, or to permit of replacement in case one of these sheets has been broken, the clips 22 are released and the wedge is pulled out progressively starting at one point and working around the window. In case sticking occurs, the cross section of the wedge is reduced by stretching the rubber longitudinally, thus facilitating removal. After the wedge has been removed, the ledge members are removed by tilting the flanges 16, so that they are close to the face of the sheet 6 which brings the shoulders 19 and 20 out of engagement, thus permitting the members to be moved laterally. Clearance is provided in the recess 18 in the frame, as indicated in Fig. 2, to permit this tilting movement. One or both of the glass sheets may now be removed without difficulty. In reassembling, the procedure just described is reversed, the glasses being placed in position, followed by the insertion of the removable ledge members bringing them to the position shown in Fig. 2, after which the wedge 21 is forced into position.

Fig. 3 illustrates a modification, in which both sides of the frame 25 are provided with removable ledge members 26. In this case, the spacing and sealing member 27 is of T cross section. In other respects, the construction follows that of Figure 2. This construction, while somewhat more expensive than that of Fig. 2, has the advantage that the glass may be removed from either side of the frame, and in case of breakage of either sheet, it is only necessary to remove one of the glass sheets, as opposed to the procedure required in the Fig. 2 construction in case it becomes necessary to remove the left hand sheet 6. In such contingency with the Fig. 2 construction, it is necessary to remove both of the glass sheets.

The construction of Fig. 3 also involves a different means for locking the wedges 28, 28 in position. To accomplish this result, the flanges of the ledge members 26 are provided with longitudinal grooves 29, so that when the wedges are forced into position, the material of the wedge which is under compression bulges into the groove and locks the wedge against outward movement.

Figs. 4 and 5 illustrate a modification similar to that of Fig. 2 except that a different means is shown for securing the rubber wedge against accidental displacement. To secure this result, the inclined face of the flange 16 is provided with teeth which are adapted to interlock with the teeth 31 (Fig. 5) on the wedge 32. To give still greater security against accidental displacement of the wedges, a screw 30 may be employed for

each wedge, such screw extending through the flange 30 and penetrating the wedge a short distance. While the locking means for the wedges, as heretofore described, are desirable, particularly for large size windows, it is quite feasible to dispense with such locking means, as the wedges are forced in under such pressure that a very considerable amount of force is required to displace them. The resistance against removal is further increased in the course of time, as the rubber tends to become adherent both to the glass and to the face of the flange.

In the construction shown in Fig. 6, the ledge member 33 has a modified base portion 34 fitting in the recess 35 in the frame 36, and such base portion is provided with a locking rib or shoulder 37 fitting beneath a rib 38 on the frame. When the wedge 39 is removed, the ledge member can be tilted so as to permit its ready removal from the frame as in the constructions heretofore described.

The modification of Fig. 7 is on the order of the construction of Fig. 3, as two removable ledge members 40, 40 are employed. In this case, the spacing member between the glass sheets is in the form of a flange 41 integral with the frame around which is fitted the rubber sealing means 42. A further departure from the constructions heretofore described, is in the use of the locking strips 43, 43 which are not of wedge cross section. Since there is no wedge action, the edges of the glass sheets must be pressed inward compressing the spacer, before the locking strips are inserted. After their insertion, the spacer which is under compression keeps the locking strips under pressure, so that there is no danger of their accidental displacement. In this construction, as well as with those employing the wedge locking strips, the strips may be made of hard or soft rubber or of yielding or unyielding composition, such as fiber formed under high pressure.

The Fig. 8 modification is similar to that of Fig. 6, except as to the means for locking the ledge member 44 to the frame 45. There are no interlocking ribs or shoulders, as in the other modifications, the locking function being accomplished by the frictionally engaging surfaces at 45a, which may be toothed, as shown, to increase the resistance to relative movement after the parts are assembled with outward pressure applied to the upper end of the ledge member incident to the compression of the rubber spacer 46. After the wedge strip 47 is removed, the member 44 is readily removed by tilting its upper edge toward the glass sheets, as described in connection with other forms of the invention, clearance being provided at 48 to permit of the tilting.

What I claim is:

1. In combination in a double window construction, a pair of glass sheets in parallel with yielding spacing and sealing means therebetween around their margins, a frame in which the sheets are seated, removable ledge members on each side of the frame each having a flange in opposition to the edge of the glass sheet and having a base portion fitting into the frame in interlocking engagement therewith but releasable therefrom when its flange is tilted toward the glass sheet, and wedges between said flanges and the glass sheets which they oppose, such flanges having their inner faces inclined to fit the inclination of the wedges, and the wedges and spacing means being under compression.

2. In combination in a window construction, a glass sheet, a frame in which the sheet is mounted, ledge means on one side of the frame in opposition to the edge of the sheet, yielding backing up means between the ledge and the edge of the sheet, removable metal ledge members on the other side of the frame, each having a flange in opposition to the edge of the sheet and having a base portion fitting into the frame in interlocking engagement therewith but releasable therefrom when its flange is tilted toward the glass sheet and wedge means between the flanges of the removable ledge members and the glass sheet, said flanges having their inner faces inclined to fit the inclination of the wedge means, and the wedge means and backing up means being under compression.

3. In combination in a window construction, a glass sheet, a frame in which the sheet is mounted, ledge means on one side of the frame in opposition to the edge of the sheet, yielding backing up means between the ledge and the edge of the sheet, removable metal ledge members on the other side of the frame, each having a flange in opposition to the edge of the sheet and having a base portion fitting into the frame in interlocking engagement therewith but releasable therefrom when its flange is tilted toward the glass sheet, and wedge means of yielding resilient composition between the flanges of the removable ledge members and the glass sheet, said flanges having their inner faces inclined to fit the inclination of the wedge means, and the wedge means and backing up means being under compression.

4. In combination in a window construction, a glass sheet, a frame in which the sheet is mounted, ledge means on one side of the frame in opposition to the edge of the sheet, yielding backing up means between the ledge and the edge of the sheet, removable metal ledge members on the other side of the frame, each having a flange in opposition to the edge of the sheet and having a base portion fitting into the frame in interlocking engagement therewith but releasable therefrom when its flange is tilted toward the glass sheet, wedge means between the flanges of the removable ledge members and the glass sheet, and means for locking said wedge means releasably in position, said wedge means and the backing up means being under compression.

5. In combination in a window construction, a glass sheet, a frame in which the sheet is mounted, ledge means on one side of the frame in opposition to the edge of the sheet, yielding backing up means between the ledge and the edge of the sheet, removable metal ledge members on the other side of the frame, each having a flange in opposition to the edge of the sheet and having a base portion fitting into the frame in interlocking engagement therewith but releasable therefrom when its flange is tilted toward the glass sheet, wedge means between the flanges of the removable ledge members and the glass sheet, and means for locking said wedge means releasably in position, said flanges having their inner faces inclined to fit the inclination of the wedge means, and the wedge means and backing up means being under compression.

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