Nov. 27, 1934. J. D. PHILLIPS 1,982,351

WINDOW

Filed April 27, 1934

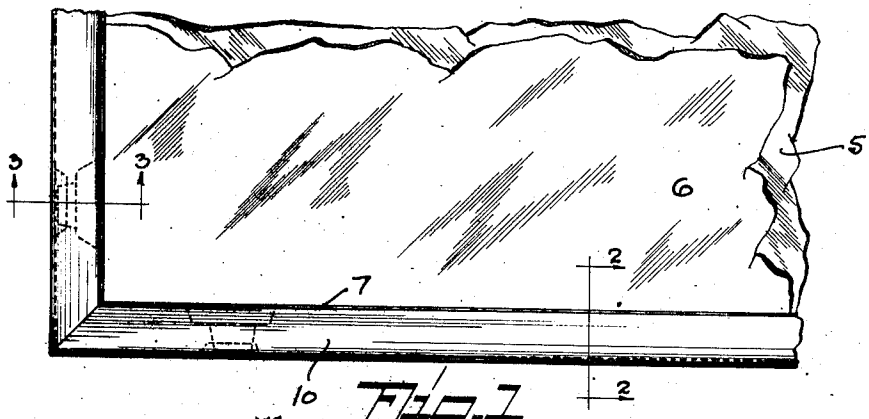


Fig. 1

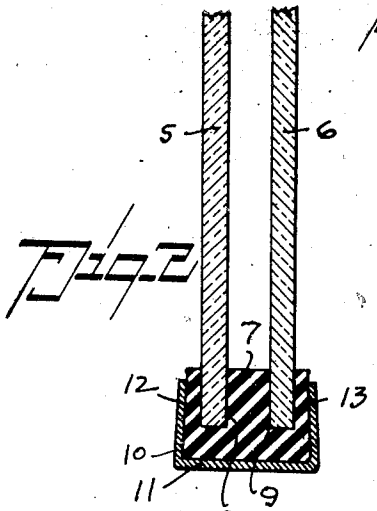


Fig. 2

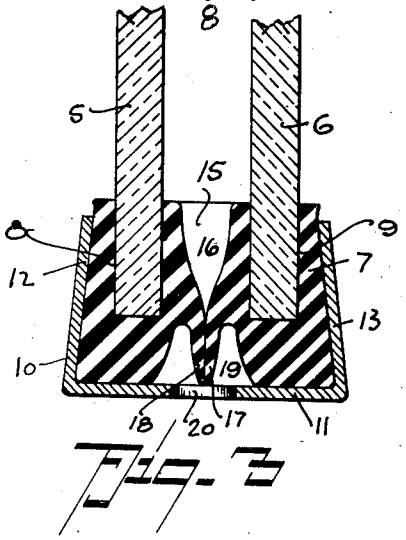


Fig. 3

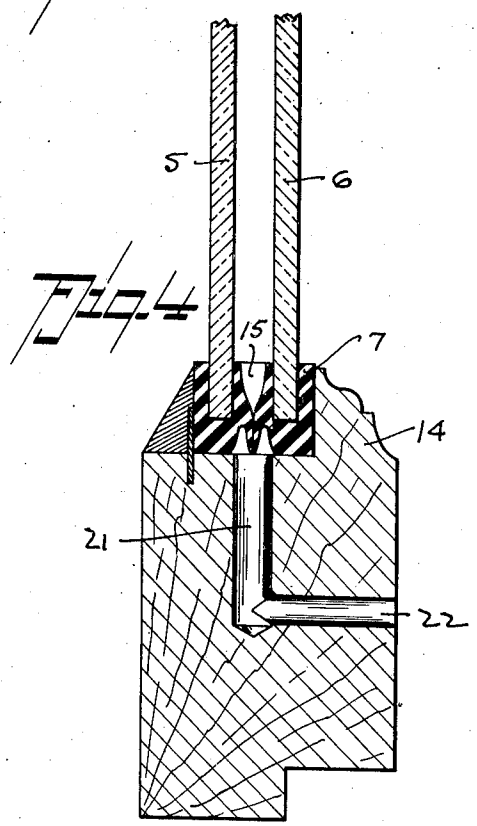


Fig. 4

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Patented Nov. 27, 1934

1,982,351

UNITED STATES PATENT OFFICE

1,982,351

WINDOW

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Application April 27, 1934, Serial No. 722,672

1 Claim. (Cl. 20—56.5)

My present invention relates to windows and especially to windows having double panes of glass and an air space therebetween and which have for their purpose use as insulating, transparent windows.

An object of my invention, in addition thereto, is to provide a window which will be free of frost due to extreme cold on one side and a warmer and humid condition on the other side.

Another object of my invention is to provide a window structure manufactured and ready for installation which has incorporated into its structure venting means which will allow any air between the glass and the frame supporting the glass, when expanded by heat from any means or agency, to find exit and thereby maintain a low but partial vacuum under certain given conditions in the space between the glass.

The invention is particularly adapted for use in automotive vehicles, airplanes, street cars, trains, and for residential and other structures.

Other objects and advantages of the invention will be apparent during the course of the accompanying description. In the accompanying drawing forming a part of the specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a partial front elevation of my window or panel embodying my invention.

Figure 2 is a vertical cross section taken on the lines 2—2 of Figure 1.

Figure 3 is a horizontal section taken on line 3—3 of Figure 1 and Figure 4 is a vertical section similar to Figure 2 but showing the device or window as applied and used in the wood sash of the usual window.

My window is made up of two panes of glass, as 5 and 6, spaced apart and mounted or supported in a liner member 7 which I prefer to be of rubber or a resilient composition having adhesive qualities and considerable resiliency. The liner 7 is provided with grooves 8 and 9 for receiving the glass panes 5 and 6 respectively and the panes may be sealed therein by suitable cement or the liner may be made of soft gum rubber and vulcanized to the panes of glass or by heat treatment be caused to adhere thereto so as to make a tightly sealed joint between the glass and the liner.

For ordinary use and to insure a substantial article of manufacture I place a frame 10 around the liner, in which a base 11 forms the edge of the frame and the end-turned legs 12 and 13 form the side members for the frame.

When the assemblage has been made, as I have described, the legs of the frame 12 and 13 may be pressed together by suitable means, such as by inserting the window in its assembled form into a press and squeezing the legs 12 and 13 so that they insure a rigid contact of the material of the liner against the edges of the panes of glass.

In another form of such use I dispense with the use of the metal frame 10 and I insert the rubber liner directly into the wooden sash 14 of common use. (See Figure 4.) In this situation the usual putty points and putty are used to hold the window frame thus constructed in place and to allow it to function in the usual manner of panes, with the certain advantages, of course, that I maintain for my invention.

Referring to Figure 3 which is somewhat of an enlargement over a standard size window, I show a vent 15 for that space between the two panes of glass and bounded by the liner member 7. This vent is a one-way vent. That is, it is formed with a slotted opening as 16 terminating into a very thin slit at 17 which is normally held closed by the resiliency of the material and by the pressure of the material applied thereto. On the outer edge of the liner as 18 the vent is fashioned in the shape of a lip or a pair of lips by molding or forming around the vent slit a groove, as 19. Wherever the frame 10 is opposite one of these vents, which may be one or more in number to each frame, an opening 20 is cut into the frame to allow the escape of air.

In Figure 4 the same vent 21 is provided in the wood sash or band and preferably in the bottom band of the sash and a lead-off 22 at right angles is a convenient manner of insuring that the air escape may be possible. While I have shown a vent at 3—3 in one of the end walls of a pane of glass, it is likely that a preferred form will always include one or more vents in the bottom of the glass, that is, through the liner and frame in case moisture from any cause should generate between the panes of glass and when condensed would locate in the pocket or vent 15 or be passed therethrough at certain times.

It is well known in physics and according to the natural laws, that the highest form of insulation is a dead air space or, preferably, a vacuum. I maintain, first, a dead air space at all times, since air can not pass through the one-way vent into the interior, but such air as may be therein, when expanded by heat or similar agencies, can pass through the vent and be sealed therefrom against return, barring leakage from some other source.

So, as an insulation, my form of construction offers advantages in a saving of fuel for heated interiors against cold outside conditions and for the conservation of fuel for that purpose. Likewise in summer time a building or structure so equipped will be cooler by reason of the withholding of the transference of heat from an outside source to the interior. In a single pane of glass heat may travel easily. It can not travel so easily through two panes of glass with a dead air space or a partially air evacuated space therebetween.

Now I come to the prime and principal object of my invention which has to do with the rendering of a window, such as is most commonly used in dwellings or other structures and especially in automobiles, airplanes, street cars, or trains, where it is desirable to have visibility. In fact, where visibility is necessary to the proper operation of such structures or vehicles.

A structure may be just as cold inside as the atmosphere outside. The entrance of one or more persons therein will immediately, in cold weather, cause frost to form on the inner face of the glass, as a windshield or other windows of a structure. This obscures the view, makes driving extremely hazardous, and is otherwise annoying. With the structure that I have formed even a marked difference in the temperature between the exterior and interior will not be registered because of the insulating values of the two panes and the consequent air space therebetween and, therefore, assurance may be had of clear vision at all times as well as the insulating values that have been mentioned. For the most part, the window of my structure is automatic in its functioning and operation.

Let us assume that the sun comes up and shines upon the windshield of an automobile or any of the car windows so equipped. At various times of the day the car will be going in different directions and all sides will be exposed. The heat of the sun on the outside glass will warm the glass and thereby expand any air that may be between the two panes. When this air has been expanded beyond the normal outside atmospheric pressure it will pass through the vent or vents formed in the liner member and when equalized the vent will automatically close and as the pane is cooled off by a change of direction the outside pressure will be the greater and, therefore, will aid in pressing the lips 18 of the vent closely together to maintain the seal.

If it is desirable in certain climates to artificially produce this kind of condition, that is, the partially exhausting of the space between the two panes of glass, a blast of warm air may be applied to the glass to accomplish the same purpose and render a higher degree of insulation value in the window.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

A window comprising spaced glass plates supported in a resilient frame member having air-tight connections therewith, normally closed vents through the resilient frame member, said vents provided with extending lips in the outer face of the resilient frame member and a rigid frame surrounding the resilient frame and pressing on the sides thereof.

JOSEPH D. PHILLIPS.