July 5, 1938. P. F. BOWMAN 2,123,093

INSULATING WINDOW

Filed Nov. 9, 1936

Fig. 1.

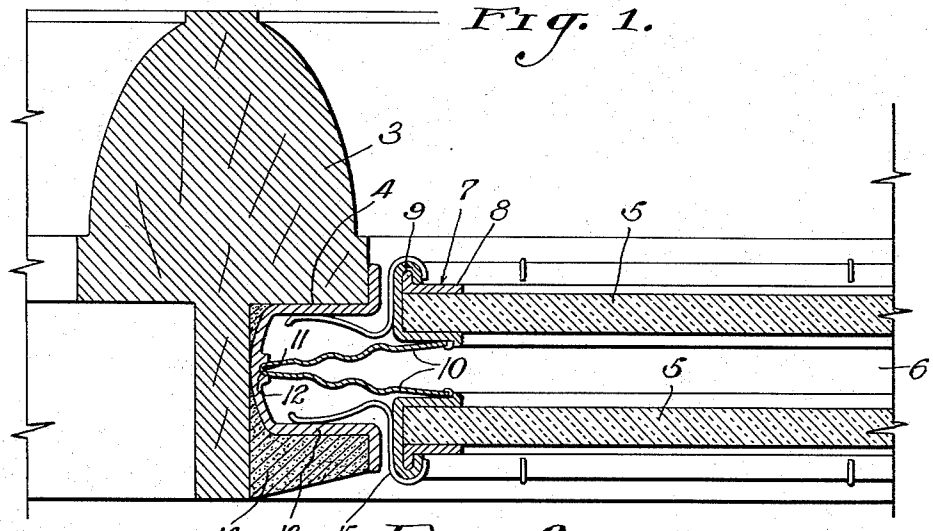
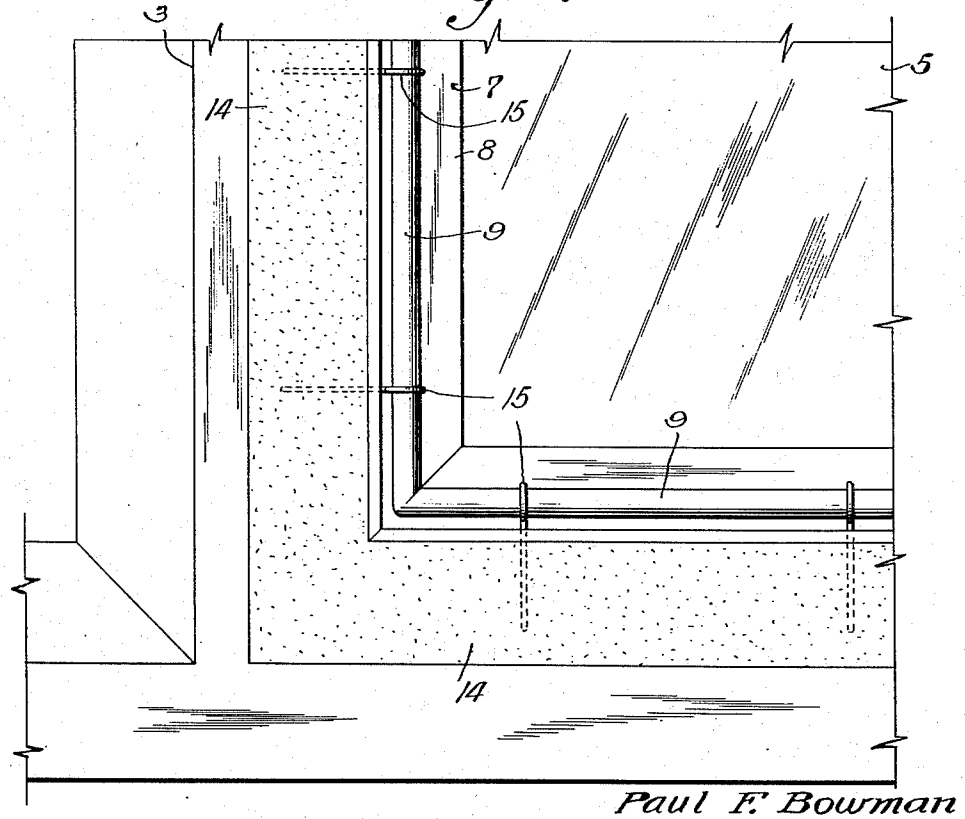


Fig. 2.



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Patented July 5, 1938 2,123,093

UNITED STATES PATENT OFFICE

2,123,093

INSULATING WINDOW

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Application November 9, 1936, Serial No. 109,991

4 Claims. (Cl. 20—56.5)

The present invention relates to window construction and more particularly to the means for securing a double thickness of glass within a window frame so as to provide an insulating layer therebetween.

The primary object of the invention is to provide a novel construction of window affording means for the installation of two panels of glass in a single opening to provide an insulating cell between same so as to minimize the conductance of heat thru the window.

A further object of the invention resides in the provision of a window structure so arranged as to obviate the formation of a condensate on the window resulting from varying atmospheric conditions existing on either side of the window.

Another object of the invention is to provide a window having in addition to the features above mentioned, simple means for the retention of the glass panels within the window frame, so formed as to afford convenient installation.

The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawing which forms part of the application.

In the drawing:

Fig. 1 is a transverse sectional view thru a portion of a window embodying the invention; and

Fig. 2 is a fragmentary front elevational view of the window as shown in Fig. 1.

Reference is now had to the accompanying drawing for a more detailed description thereof, in which the numeral 3 indicates the frame member or molding comprising the window sash, the same being preferably provided with a recessed shoulder portion 4 into which the window glass units may be installed. As before indicated, the invention comprises two glass panels 5, disposed in spaced parallelism with each other so as to form a chamber or cell 6 therebetween. Each of the panels 5 are equipped about their peripheral edges with a metallic channel 7 forming a reinforcing frame for the individual glass panels 5. The channels 7 are preferably formed of separable members including an angle strip 8 and a complemental molding 9, the latter having its edge bent over to engage a corresponding flange of the angle strip 8.

The primary purpose of the bordering channels 7 is to afford means of attachment to the glass panels 5 for metallic diaphragms 10, the same affording a resilient mounting for the panels 5. The diaphragms 10 are preferably integrally formed by bending upon itself a strip of spring metal along a line indicated by numeral 11, so as to form the coextensive members 10, each of which is corrugated along an intermediate margin to afford greater resilience.

Preferably the diaphragms 10 are mounted in the shoulder recess 4 of the window molding 3 by having their free edge 11 engaged in a groove 12 formed in a U-shaped molding 13. The molding 13 has its free edges flanged outwardly and is installed in the window frame 3 by being set in putty or suitable sealing compound 14 substantially as shown. It will be noted that the respective flanges of the molding 13 are disposed adjacent the respective edges of the panels 5 affording a minimum of space therebetween so as to permit independent movement of each of the panels 5. L-shaped springs 15 are secured to the channel springs 4 preferably at spaced intervals as shown in Fig. 2, being so formed as to securely engage the flange of the channel 7 so as to yieldably engage the inner surface of the molding 13. The springs 15 are tensioned so as to coactively urge the panels 5 toward each other thereby compressing the gas between the panels 5 which gas is confined therein by the diaphragms 10.

It is to be noted here that the cell formed by the panels 5 and the associated diaphragms 10 is to be filled with an inert gas having a low thermal conductivity, the gas being admitted at substantially atmospheric pressure. The gas confined in the cell 6 affords an insulating layer by which to materially reduce the heat losses occurring at the glass panels 5, without reducing the transparency of the window. The arrangement set forth also obviates the occurrence of condensate on the window pane in that each of the panels 5 assume the temperature of the atmosphere to which they are subjected without permitting any conductance of heat therethru. That is to say, the inner panel 5 will not be subjected to the lower temperature existing on the outside of the building and thus will prevent the formation of a condensate thereon.

It is to be understood that this improvement is capable of extended application and is not confined to the exact showing of the drawing nor to the precise construction described and, therefore, such changes and modifications may be made therein as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claims.

What is claimed as new is:

1. A window structure comprising in combination, a frame having a shoulder portion, a pair of glass panels in spaced parallelism with each other, resilient means joining said panels at their peripheries to form an airtight cell therebetween and extending beyond said panels to present a marginal member bordering same, and a U-shaped molding secured in said frame shoulder portion and having a groove therein for reception of said marginal members.

2. A window structure comprising in combination, a frame having a shoulder portion, a pair of glass panels in spaced parallelism with each other, channels bounding each of said panels, integral diaphragms having their free edges secured to said channels to form an airtight cell including said glass panels and extending beyond same to present a marginal member thereto, and a U-shaped molding secured in said frame shoulder portion and having said integral diaphragms disposed therein.

3. A window structure comprising in combination, a frame having a shoulder portion, a pair of glass panels in spaced parallelism with each other, resilient means joining said panels at their peripheries to form an airtight cell therebetween and extending beyond said panels to present a marginal member bordering same, a U-shaped molding secured in said frame shoulder portion and having a groove therein for reception of said marginal members, and spring means secured to said panels to yieldably engage said molding so as to tension said resilient means.

4. A window structure of the type described comprising a frame having a flanged U-shaped shoulder portion, a pair of transparent panels disposed in spaced relationship substantially parallel each to the other, channels bounding each of said panels, resilient members mounted on said channels and engaging with said shoulder tending to force the panels together, and V-shaped supporting means mounted in the inner bottom face of said shoulder presenting extended resilient members which, cooperating with portions of the channels at the inner opposing faces of the transparent panels, hold same in relatively fixed position, substantially seal the gas chamber bounded by the transparent panels and tend to move the panels away from each other acting against the said resilient members mounted on the channels.

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