

May 27, 1924.

1,495,948

R. J. CARNEY

WINDOW

Filed Dec. 30, 1920

Fig. 1.

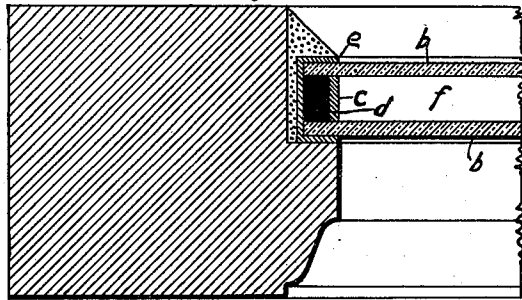


Fig. 3.

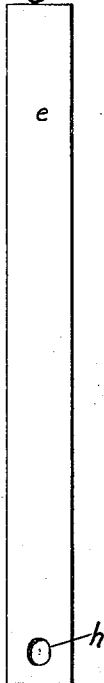


Fig. 2.

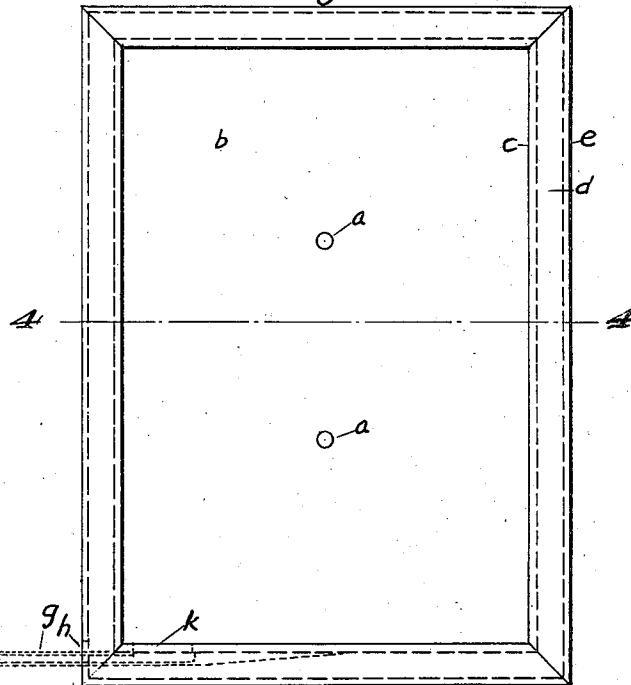


Fig. 5. Fig. 6.

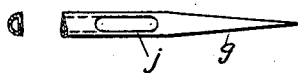
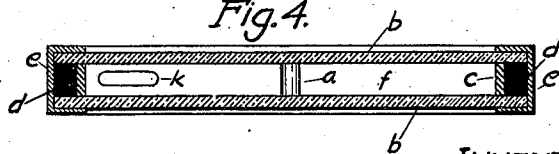


Fig. 4.



WITNESSES

Basil R. Deering
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INVENTOR

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Patented May 27, 1924.

1,495,948

UNITED STATES PATENT OFFICE.

RALPH JOHN CARNEY, OF BOSTON, MASSACHUSETTS.

WINDOW.

Application filed December 30, 1920. Serial No. 434,017.

To all whom it may concern:

Be it known that I, RALPH JOHN CARNEY, a citizen of the United States, residing at Boston, in the county of Suffolk and the State of Massachusetts, have invented a new and useful Window, of which the following is a specification.

My invention relates to an improvement in windows, which I call a vacuum window pane, and its object is to provide a greater resistance to the passage of heat and cold through the glass of the window panes without lessening their transparency to any noticeable extent.

My invention is particularly useful in buildings, particularly factories, of modern construction, wherein a large part of the wall space is devoted to windows for purposes of light and ventilation. The use of so much glass in a building necessarily makes that side of the building much colder than it would otherwise be, if, instead of the windows, the usual wall space were in use. In such cases my invention is particularly useful as offering a vacuum window pane unit complete, which may be installed in the regular window sash wherever, and to any extent desired, and thus act as an effective barrier against the transmission of cold from without to the interior of the building, and thereby lessen the additional amount of heat required to offset the cooling of the enlarged window expanse. My invention is also useful in many other connections as in vehicles, refrigerators, etc., wherever it is desirable to install a window of this kind without making special preparation therefor in the construction of the building or vehicle.

I attain this object by the construction illustrated in the accompanying drawing, in which—

Figure 1 is a section through one side of an ordinary window sash with a double glass window pane in place; Fig. 2 is the front view of a double glass window pane; Fig. 3 is an edge view of said double glass window pane; Fig. 4 is a section through said double glass window pane on line 4—4, Fig. 2; Fig. 5 is a section through an air-pump terminal which is not a part of this invention but is shown for purposes of illustration; Fig. 6 is a side view of said air-pump terminal.

Similar letters refer to similar parts throughout the several views.

In constructing the double glass window pane the separators *a*, preferably of glass, are cemented to one plate or sheet of glass *b*; the inner frame *c*, and the packing *d*, of rubber or the like are placed between the plates or sheets of glass *b*, then the outer metal frame *e*, is pressed or soldered in place around the double glass window pane. The packing *d*, is normally substantially larger than the space which it is intended to occupy so that when it is in place it is under compression thus rendering the enclosure of inner space *f*, air-tight.

The sharp-pointed air-pump terminal *g*, is then inserted at the hole *h*, piercing the vertical strip of packing *d*, and forced in between the top of the lower or bottom strip of packing and the inner frame, the packing forcing the terminal into close engagement with the under side of the bottom member of the frame *c* until the opening *j*, in the side wall of the terminal *g*, comes opposite the opening *k*, in the bottom inner frame *c* member, Fig. 4, thus forming an outlet through which the air may be extracted from the inner space *f*, through the hollow air-pump terminal *g*, making said space a vacuum or semi-vacuum. When the air-pump terminal *g*, is withdrawn the packing *d*, being resilient, will resume its former position thus closing the opening *k*.

The space occupied by the packing *d*, may be filled with wax, cement, glue, lead or any other metal or material, and a closable or self-closing opening or valve provided for the extraction of the air from the inner space *f*. The frames *c*, and *e*, may be of metal or of any other material.

The vacuum-insulated window pane may then be set in an ordinary sash with putty as shown in Fig. 1, or in any other style of frame, opening or sash, by any other method.

A double glass window pane might be made entirely of glass with a vacuum space incorporated therein during the process of manufacture; or it might be made mainly of glass with a partial frame of metal or other material which would enclose in conjunction with said glass an inner space to be rendered a vacuum by the extraction of the air therefrom through an opening provided for that purpose and hermetically sealed after the air had been extracted from the inner space.

An insulated window pane might be made

of transparent or semi-transparent material enclosing an inner space and having an opening through which the air could be extracted from said inner space, said opening to be hermetically sealed after the air had been extracted from the inner space thus establishing a vacuum.

I am aware that the use of a vacuum to retard the passage of heat is not new as it has been used in what is known as the vacuum container. I therefore do not claim insulation by means of a vacuum space broadly; but

I claim:

1. A compound window pane comprising parallel sheets of glass, means provided with an aperture and interposed between and co-acting with said sheets to enclose a hollow space, resilient sealing means interposed under compression between said sheets and in contact with and co-extensive with the outside of the first-mentioned means, the second-mentioned means being

adapted to be perforated by the terminal of an air exhausting means, and to yield as the terminal is forced into cooperative relation with said aperture to permit exhaustion of the air from the hollow space, and to return to original condition to seal the aperture when the terminal is withdrawn.

2. A compound window pane comprising a plurality of sheets *b* of transparent material, separators *a* therefor, an apertured frame *c* also for the sheets and therewith forming an enclosed space, compressible material *d* surrounding said frame and sealing the joints between it and the panes *b* and adapted to be punctured by the terminal of an air pump *g* for exhausting the air from the space.

RALPH JOHN CARNEY.

Witnesses:

BASIL R. DEERING,
EDGAR C. BROSS.