

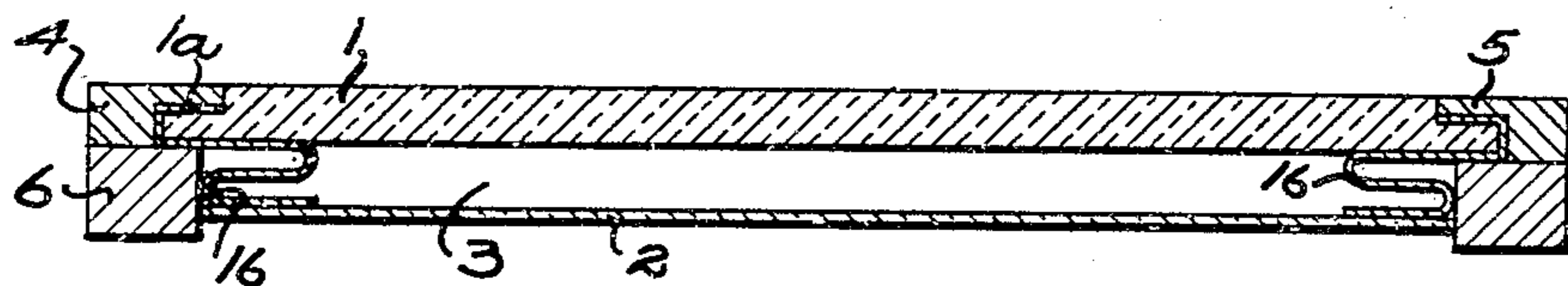
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DOUBLE WINDOW

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BY

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# UNITED STATES PATENT OFFICE

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## DOUBLE WINDOW

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### 1 Claim. (Cl. 20—565)

This invention relates to improvements in double windows, and refers particularly to a double window construction intended for use on airplanes and especially on those intended to fly at high altitudes.

Vehicles have already been equipped with double windows having a gas tight space enclosed between them which could be heated. Dry gas was injected and heated therein to prevent condensation on the panes. Such windows, however, when applied to airplanes are open to the objection that it is necessary to employ very thick glass because of the differences between the air pressures exerted upon the panes and the pressure of the gas exerted upon the latter, thereby materially increasing the weight of the windows. Spacing members have also been employed to reinforce the panes and permit the use of thinner glass but such an arrangement produces interrupted vision, and the spacing members are difficult to fasten satisfactorily.

Double windows have also been utilized where the panes were subjected to only slight differences in air pressure and were made of special thin glass of high tensile strength and high elasticity to withstand such slight differences; but when such windows are employed in airplanes flying at high altitudes so much deformation occurs, due to variation in air pressures, that vision is so distorted as to render it unsafe to use them for cockpits. Double windows having a gas tight seal between the panes and means for substantially equalizing the pressure of the gas and that of the air exerted on both panes, which in that instance is the same, have been employed on ground vehicles.

This invention aims to provide a double window which is light in weight, and which affords good insulation and unhindered vision without distortion.

Another object of the invention is to provide a double window consisting of a thicker outer pane to resist stresses caused by differences in air pressure inside and out, and a thinner inner pane yieldingly mounted relative to the outer pane whereby the pressure of gas sealed in the chamber between the panes is automatically equalized with the air pressure exerted against the opposite side of the inner pane.

A further object of the invention is to provide a double window having an outer pane thick enough to protect the inner pane from all stresses resulting from differences in air pressure, thereby permitting the use of a very thin inner pane which requires no reinforcement which would

result in partially obstructed vision and a pane that is not liable to deformation which would result in distorted vision.

Yet another object of the invention is to provide a double window wherein the inner pane is supported for movement upon an annular bellows-like mounting extending inwardly from around the outer pane so that gas tight seal is positively maintained at all times between the panes.

Having thus enumerated some of the major objects and advantages of the invention we will now proceed to describe a preferred embodiment of the double window with the aid of the drawing wherein a sectional view thereof is shown.

Referring to the drawing, 4 designates an outer frame having a relatively thin inwardly directed flange 5 formed substantially flush with its outer face, and secured to the inner face of the said outer frame is an inner frame 6 all the sides of which project inwardly beyond the sides of the outer frame 5. Mounted in the latter is a thick outer pane 1 having an annular recess 1a formed around its outer edge to receive the annular flange 5 so that the outer faces of the frame 4, the flange 5 and the pane 1 are all substantially in alignment. The inner side of the outer pane 1 is marginally supported by the inner frame 6.

One extremity of an annular bellows-like resilient mounting 16 is held between the flange 5 and the recessed portion 1a of the outer pane. This mounting is flexed and supported both between the peripheral margin of the pane 1 and the adjacent portion of the frame 4, and between the inner face of the said outer pane and the adjacent face of the inner frame 6. The rearwardly intermediate portion of the mounting 16 is folded outwardly towards the wall of the opening through the inner frame 6 and terminates in an inwardly folded extremity to which an inner pane, which is relatively quite thin, is marginally secured to form a gas tight chamber 3 between the panes 1 and 2.

From the foregoing it will be readily seen that due to the resilience of the bellows-like mounting 16 the pane 2 is automatically moved to equalize the gas pressure within the chamber 3 with the air pressure acting upon the inner face of the inner pane 2, thereby increasing or decreasing the volume of the said chamber. Again due to the mounting of the outer pane 1 in the folded outer portion of the mounting 16 so that a joint is made between the latter and the inner face of the outer pane the folded intermediate portion of the mounting is in no way dependent

upon the wall opening of the inner frame to seal the chamber and may be of such size as to be clear of the said wall at all positions of the inner pane 2.

While in the foregoing the preferred arrangement of the invention has been described and shown, it is understood that the construction is susceptible to such alterations and modifications as fall within the scope of the appended claim.

What we claim is:

A double window construction comprising an outer frame having a ledge along one side of its inner periphery, an inner frame in juxtaposition with said outer frame and forming with said

ledge a recess, a closed contour resilient mounting one margin of which is doubled back to conform to the shape of said recess and is seated therein, a relatively thick outer pane having 5 a marginal ledge conforming to said recess and seated therein to thereby lock in position within the recess the seated margin of said resilient mounting, and a relatively thin inner pane slidably arranged within said inner frame in substantial parallelism with the outer pane, the 10 other margin of said resilient mounting being secured to the outer face of the inner pane.

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