April 21, 1942. E. S. PERSSON 2,280,540

WINDOW

Filed Sept. 7, 1938

Fig. 1.

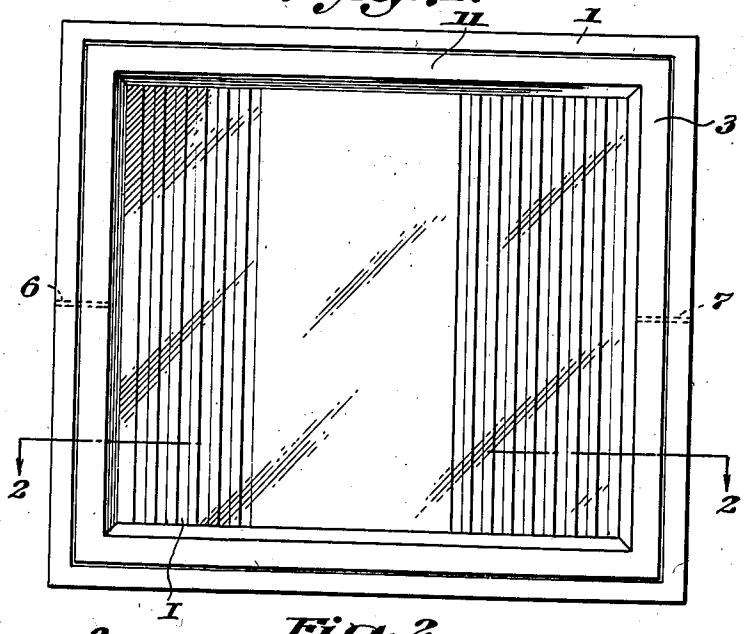


Fig. 2.

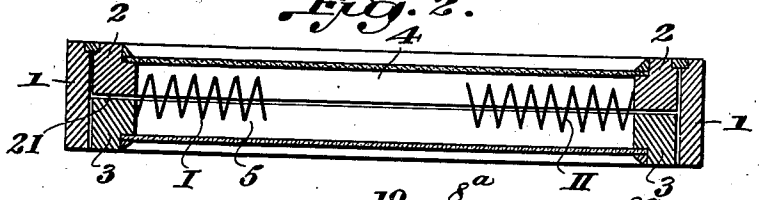




Fig. 4.

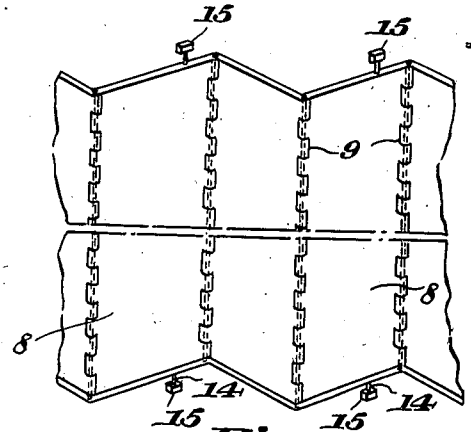


Fig. 3.

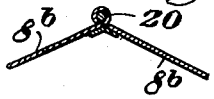


Fig. 5

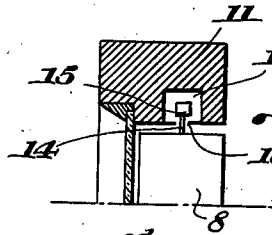


Fig. 7.



Fig. 6

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2,280,540

WINDOW

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In Sweden November 5, 1937

3 Claims. (Cl. 20—56.5)

In connection with windows mounted to turn on a horizontal axis specific problems are often encountered with regard to the shading possibilities. This applies to windows of the type described in Letters Patent No. 2,186,270. In said window the top is turnable inwards, and a window blind mounted at the inner side of the top piece of the window frame will have to be pulled up to allow the window to be turned to a ventilation position or to be turned round to a cleaning position.

Attempts have been made at removing said inconvenience by mounting the blind at the inner side of the top piece of the sash but this solution is not satisfactory. The fact is that said arrangement is clumsy and inesthetic and the blind prevents the window from being turned around through an angle of 180° since the blind engages the bottom piece of the window frame before the completion of said turning movement. Also for adjustment of the window to a ventilation position when the blind is wholly or partly pulled down this arrangement is very inconvenient.

Extensive experiments have shown that a blind mounted between the panes of the window referred to above does not solve the problem in a satisfactory way. One of the reasons is that the roller of the blind with the blind rolled onto it steals inproportionally either from the light opening of the window sash or from the wood material of the top piece of the window sash depending upon whether the blind is mounted at the lower side of said top piece or set into the same.

Another disadvantage lies in the fact that most of the materials utilizable for the shading device or blind are not suitably used in pieces of a size corresponding to a whole window when positioned between the panes. Buckles are readily formed both due to inclination of the window for ventilation purposes, and due to the action of the sun. Said last mentioned action is frequently very intensive due to the fact that the shading device is placed between the panes. If the window is in a ventilation position and the blind more or less pulled down, said blind will to a more or less considerable extent rest in contact with the surface of the lower pane and if there is some moisture on said surface the blind may readily be damaged and, besides, it may stick so closely to the surface of the pane that it cannot be operated without great difficulty.

In the case of a blind made from Cellophane or similar waxed material the further drawback arises that particles of dust always existing between the panes are deposited on the blind and clamped between the turns thereof when rolled onto the roller or between the blind and the pane, in both cases causing scratches in the blind which spoil the appearance thereof.

The present invention has for its object to remove the above mentioned disadvantages and it relates to an improvement in windows turnable on a horizontal axis and having double panes. The characteristic feature of the invention resides in the fact that a shading device is mounted between the panes comprising a folded shutter provided with operating means available from the inside of the window.

An embodiment of the invention is described below with reference to the drawing, in which—

Fig. 1 shows a side elevation from the outside of a window provided with a shading device according to the invention,

Fig. 2 shows a horizontal sectional view on line 2—2 of Fig. 1,

Fig. 3 shows a partial perspective view of the shading device drawn to a larger scale,

Figs. 4, 5, and 6 show horizontal sectional views of three further embodiments of the shading device, and

Fig. 7 shows a carrying, or guiding, device for the shutter.

In the drawing, the invention is applied to a window comprising a frame 1 and two sashes 2, 3 each provided with a pane 4 and 5, respectively. The sashes are turnable together on horizontal pivots or the like situated at 6 and 7.

Between the panes 4, 5 of this window the shading device is secured. In the embodiment shown it consists of two shutters I and II, each comprising a number of strips or slat-like portions 8 articulated to each other along the longitudinal edges.

The joint between the strips or slat-like portions 8 can be effected in several different ways, depending upon the material, from which the strips 8 or slat-like portions are made. In the embodiment shown in Fig. 3 the joint is effected by a hinge device 9 made in a similar way as the hinge device generally used for piano covers.

In Fig. 4 another device having the same object is shown, consisting of thin and relatively narrow cloth strips 10, which are fastened to the edge parts of the strips or slat-like portions 8*a*. Instead of cloth strips, similar strips of another suitable material may be used. There are also numerous other ways for effecting the joint, and two of them are diagrammatically shown in Figs. 5 and 6. The device according to Fig. 5 corresponds with Fig. 4 except that a steel wire 20 is provided under the strip 8*b* as a kind of reinforcement. According to Fig. 6 the shutter is made from a material that is, or can be made, so rigid and springy, that it can be given and maintain the shape shown in Fig. 6 to have a plurality of integrally connected slat-like portions 8*c* having connecting portions 8*d*.

In the embodiment shown having two shutters I and II it is suitable to make one from a trans-

lucent material softening the light, while the other is made from an opaque material, and in this case the two shutters I and II ought to be made and placed so, that each of them is sufficiently large to cover the whole window-opening, and further so arranged that they can be independently operated.

Also in respect of the carrying and operating means of the shading devices there are a number of different possibilities. As an example of a suitable carrying device, in Fig. 7 a groove 12 is shown arranged in the top piece 11 of the sash, said groove being covered but for a narrow slot 13 in its lower side. At the top, the shutter is provided with a ball 15 or a similar thing, fastened on a thin shaft 14. Such a device is mounted for instance on each other strip 8, and the shaft 14 is thin enough to be displaced in the slot 13, while the ball 15 is so large that it cannot pass the slot. There is a similar device at the bottom piece of the sash.

For the operation a wire is suitably used, (not shown), which is fastened to balls 15, at the top and the bottom connected with the front edge of the shutter, and is placed in the groove 12 and, in a manner known per se, arranged so, that by pulling one part of the wire the front edge of the shutter is displaced while maintaining its vertical position. If the wire be secured to the balls 15 of the strip situated at the front edge of the shutter, it runs suitably through holes in the other balls to the side piece of the frame, where the operating means are advantageously provided.

The shading device may also consist of a single shutter, carried, for instance, at the top edge of the window and operated by means of wires extending from a stiffening device at the bottom edge to top piece of the sash and through holes and grooves in said top piece to the inside of the window. If, in this case, guidings are needed they are secured to the side pieces of the window.

It may be said that if a shutter is made from a Cellophane material of a suitable colour, and placed between the panes, said shutter would shut out the light heat radiation from the sun and in this manner would contribute to make the rooms cooler. The heat shut out will essentially be accumulated in the space between the shutter and the outer pane and in order to conduct it away the shutter is suitably secured inside the opening 21 between the sashes 2 and 3. This opening, in some cases made a little wider than otherwise needed, is connected with the atmosphere, and in this way ventilation of the space in question is effected.

In all the embodiments described above the shutter is suitably made so large, that even in the position when the shutter totally covers the panes, said shutter is somewhat folded, i. e., it can not to be extend so far as to become completely plane. Thus, in an inclined position of the window the shutter will never engage the lower pane on a considerable surface but it contacts with the pane along the folding lines only. This involves a very important advantage as compared with a common blind or the like.

The invention is not limited to the embodiments described above for the purpose of explanation but numerous modifications may be made within the scope of the invention.

I claim:

1. In a window of the type having a frame, a sash having a pane and mounted to swing in said frame on a horizontal axis, an extensible shade attached to said sash as the outside of the pane thereof, said shade having a number of slat-like portions, one portion being joined at one side edge to the corresponding edge of an adjacent portion and at its other side edge to the corresponding edge of another adjacent portion to form a composite accordion-folded structure, the total width of said slat-like portions being considerably greater than the width of the sash opening to be covered thereby so that even in its extended position the shade will present an accordion-folded formation whereby any contact between the shade and sash pane will be a line contact between a folded edge of the shade and the pane, and a second sash having a pane and hingedly connected to the first sash at the outside thereof and swingable with said first sash, the shade thus being enclosed between the panes of said two sashes.

2. In a window of the type having a frame, a sash having a pane and mounted to swing in said frame on a horizontal axis, an extensible shade attached to said sash at the outside of the pane thereof, said shade having a number of slat-like portions, one portion being joined at one side edge to the corresponding edge of an adjacent portion and at its other side edge to the corresponding edge of another adjacent portion to form a composite accordion-folded structure, the total width of said slat-like portions being considerably greater than the width of the sash opening to be covered thereby so that even in its extended position the shade will present an accordion-folded formation whereby any contact between the shade and sash pane will be a line contact between a folded edge of the shade and the pane, and a second sash having a pane and hingedly connected to the first sash at the outside thereof and swingable with said first sash, the shade thus being enclosed between the panes of said two sashes, said sashes being slightly spaced to provide a slot between said two sashes connecting the space between the shade and the outer sash with the open air.

3. In a window of the type having a frame, a sash having a pane and mounted to swing in said frame on a horizontal axis, an extensible shade on the outside of the pane thereof, said shade having a number of slat-like portions, one portion being joined at one side edge to the corresponding edge of an adjacent portion and at its other side edge to the corresponding edge of another adjacent portion to form a composite accordion-folded structure, said sash having guides adjacent the pane, means carried by the ends of the slat-like portions of the shade and slidably associated with said guides for guiding and supporting said shade with respect to said sash, the total width of said slat-like portions being considerably greater than the width of the sash opening to be covered thereby so that even in its extended position the shade will present an accordion-folded formation whereby any contact between the shade and sash pane will be a line contact between a folded edge of the shade and the pane, and a second sash having a pane and hingedly connected to the first sash at the outside thereof and swingable with said first sash, the shade thus being enclosed between the panes of said two sashes.

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