Feb. 8, 1938. E. E. BENSON 2,107,929

STORM WINDOW

Filed June 7, 1934 2 Sheets-Sheet 1

Fig. 1.

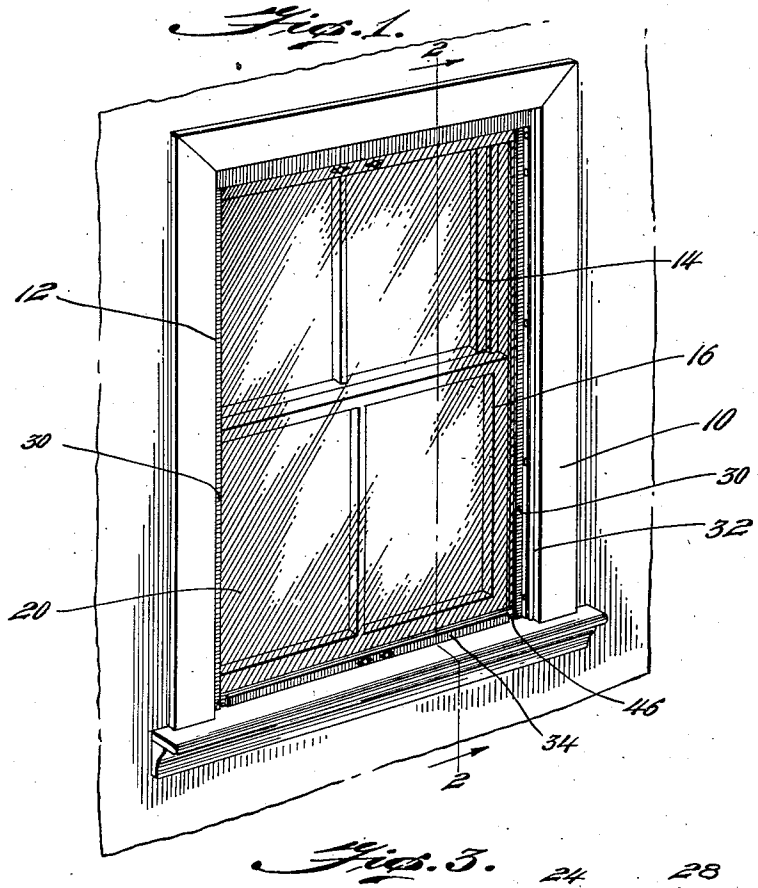
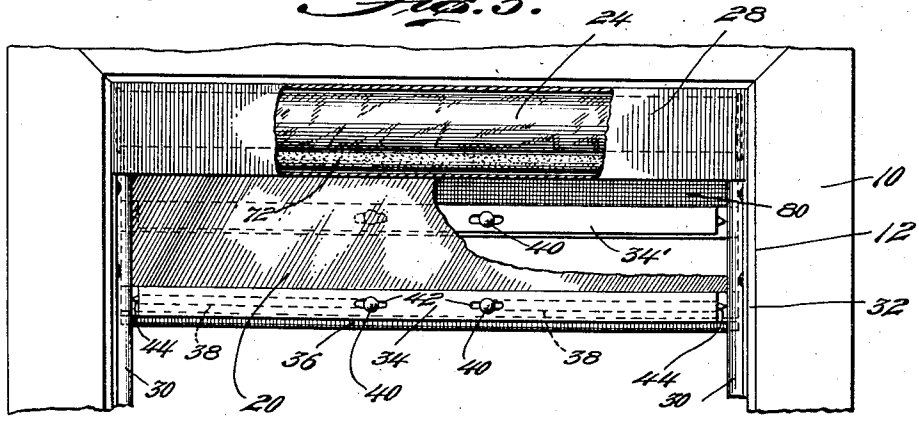


Fig. 3.



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Filed June 7, 1934 2 Sheets-Sheet 2

Fig. 2.

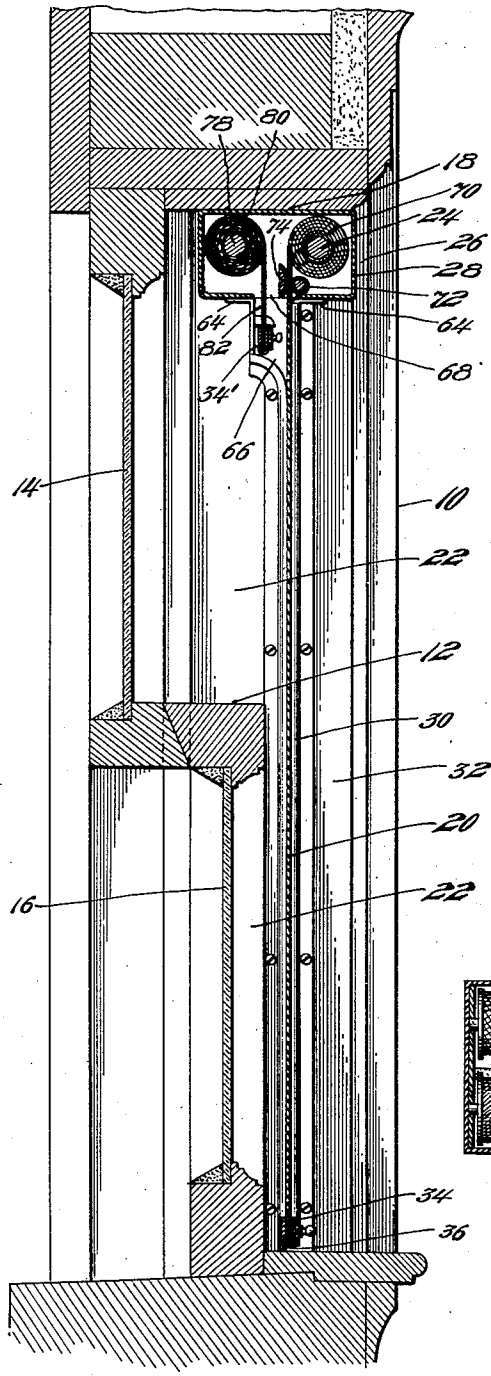


Fig. 5.

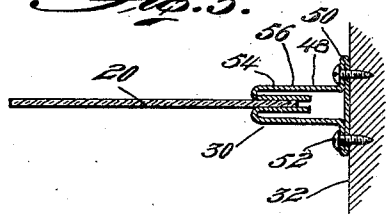


Fig. 6.

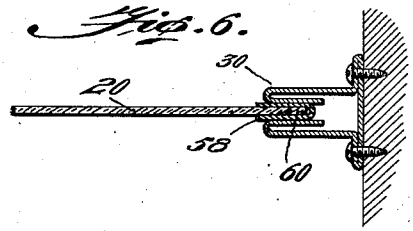


Fig. 7.

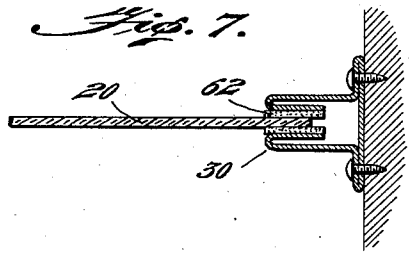
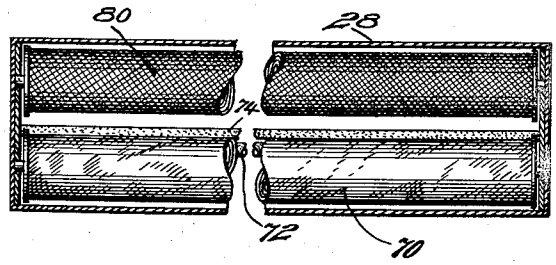


Fig. 4.



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UNITED STATES PATENT OFFICE

2,107,929

STORM WINDOW

Edward E. Benson, Providence, R. I., assignor of one-half to Emerson P. Smith, Providence, R. I.

Application June 7, 1934, Serial No. 729,395

2 Claims. (Cl. 20—40)

My invention relates to improvements in storm windows.

Hitherto storm windows have consisted of cumbersome supplemental windows generally similar to the regular permanent windows detachably secured by means of screws or otherwise inside or outside, preferably outside of the regular windows in winter time. These have been very cumbersome to attach and detach and rather unsightly when attached.

An object of my invention therefore is to provide a flexible transparent storm window, which when not desired for use in the winter time, may be readily rolled up out of sight and which if desired may be mounted in the same housing so as to be alternatively employed with a flexible window screen in winter or summer respectively.

While I am aware that others have employed flexible transparent windows and flexible transparent window shields covering a portion of the window casing opening, so far as I am aware no one has hitherto provided a flexible transparent storm window or insulating element adapted to be secured to the main window at a spaced distance therefrom and completely sealed on top, sides and bottom thereof when in closed attached position so as to form a complete air seal between said closed flexible transparent window and the main window. By providing this air space I have achieved what has been hitherto accomplished in the prior art in a better manner than the cumbersome present-day types of storm window.

Slidable screens which may be raised or lowered like window shades at will have been known hitherto, but I preferably so mount my transparent flexible improved window in the same housing as the slidable screen and guide it downwards across the window casing opening in the same guideway so that in the summer time the screen may be moved into position to close the window casing opening or in the winter time my improved transparent storm window may be selectively moved down the same guideways to effectually seal the same casing opening, thereby providing in a single mechanism means to form a storm window in winter and means to form a screen in summer.

Further features of my invention relate to the improved specific construction of my improved transparent storm window and the means I preferably employ to completely air seal it to provide the desired insulating air space in use.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of the accompanying drawings, which illustrate various embodiments thereof.

In the drawings, Fig. 1 is a perspective view of inner face of a permanent window with my improved transparent flexible storm window mounted in the window casing thereof inside of and at a spaced distance from the permanent window in lowered position closing the window casing opening.

Fig. 2 is a vertical sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a front elevation of the upper portion of the window with the housing broken away and a portion of the storm window broken away to show the screen behind it.

Fig. 4 is a horizontal sectional view taken through the roller housing looking down upon the rollers.

Fig. 5 is an enlarged detailed horizontal sectional view of one of the sealing guideways I preferably employ to air seal the side edges of my improved flexible storm window.

Fig. 6 is a detail horizontal sectional view similar to Fig. 5 in which the side edges of the window are provided with more rigid flexible reenforcing strips.

Fig. 7 is an enlarged detailed horizontal section similar to Figs. 5 and 6 in which the inner surfaces of the guideways are preferably lined with felt or other soft material.

In the drawings, wherein like characters of reference indicate like parts throughout, 10 generally indicates a window casing in which my improved window may be attached. Said window casing 10 usually has the permanent window 12 permanently mounted therein, said window 12 preferably comprising the usual upper and lower window sashes 14 and 16 relatively slidably mounted within, although it is obvious that my invention may be employed if desired with a solid plate glass window. In most windows the window casing 10 extends a substantial distance 18 (Fig. 2) inwards of said permanent window 12.

In the broader aspects of my invention, I preferably employ a flexible transparent storm window member 20 movably mounted within said casing 10 at a spaced distance inside of said permanent window 12, whereby said storm window 20 may be moved to a position substantially free of said window casing opening, or to a position closing said opening to form an air insulating space 22 between said permanent window 12 and storm window 20. In order to provide said air insulating space 22, I preferably

provide means to air seal all sides and ends of said storm window 20 when in closed position to insure the formation of said air sealing space 22, and also air seal the means to secure said storm window in closed position.

While my improved movable flexible transparent storm window 20 may be movably mounted within said casing 10 in any suitable manner, I preferably suitably mounted a roller 24 within the upper end 26 of said casing at a spaced distance inside of said permanent window 12 and secure one end of said flexible transparent storm window 20 to said roller, whereby on rotation of said roller in one direction said flexible storm window may be coiled on said roller substantially free from said window casing opening and on rotation of said roller in the opposite direction, said flexible storm window may be uncoiled to a position closing said opening to form the air insulating space 22 between said permanent window 12 and storm window 20.

In order that there may be a complete air seal at the top of my improved flexible transparent storm window when in closed position I preferably mount the roller 24 within a housing 28 mounted in the upper end 26 of said casing to form an air seal for the upper end of said casing inside of said permanent window 12. I provide aligned air sealing guideway means 30 on each side wall 32 of said casing below said housing and spaced from said permanent window. Suitable bar means 34 are mounted on the lower end of said transparent flexible window member 20 and an air seal comprising a flexible rubber strip 36 preferably projects downwardly from said bar means to form an air seal at the lower end of said casing. Suitable means are provided to secure said bar means 34 to the lower end of said casing, which in the preferred embodiment shown preferably comprise slidable rods 38 mounted within said hollow bar means 34 having the handles 40 projecting inwardly from the slots 42 in said bar means, whereby the outer ends 44 of said bar means 38 may slide into suitable depressions 46 in said guideway means 30 to lock my improved transparent storm window in lowered position closing the window opening.

While my improved flexible transparent storm window may be formed from any suitable flexible transparent material, it is preferably constructed of sheet Celluloid, preferably covered with an outer coating of cellulose or cellulose nitrate or acetate or otherwise to form a material commonly sold under the name of Cellophane. It may be formed of pure flexible Celluloid, or cellulose nitrate or acetate, or other suitable derivatives of cellulose, or if desired may be constructed of any suitable type of a synthetic resin or other suitable transparent flexible material.

In my preferred embodiments the guide ways 30 are preferably constructed as follows: Pairs of spaced rigid preferably metallic strips 48 are provided with the bases 50 which may be secured vertically at intervals to each side wall of said casing by means of the screws 52. Said strips 48 are provided with the projecting portions 54 each having an inturned outer end 56 spaced a slight distance from its respective pair end to form the guideway 30 on each side wall of said window casing spaced inwardly of said permanent window, as shown in Fig. 5. If desired, however, as shown in Fig. 6 each side edge of the flexible transparent storm window may be provided with the flexible preferably metallic reenforcing strips 58 secured around each outer edge thereof to form protective means to protect each side edge 60 of said transparent storm window in sliding up and down within the guideway 30 and to assist in forming with said resilient guideway an air seal for the side edges of my improved flexible transparent storm window. As shown in Fig. 7 if desired, the inside edges of said guideways 30 may be additionally lined with a resilient substance, such as the felt 62 shown therein so as not to fray the side edges 60 of my improved flexible transparent storm window 20.

In my preferred embodiment the roller housing 28 is preferably mounted on the upper ends of said strips such as by the integral inturned upper ends 64 thereof (Fig. 2), one end 64 near the upper end thereof being spaced a greater distance from the other strip end 64 so as to provide the supplemental casing 66 below the enlarged slot 68 substantially centrally of said housing member 28 for a purpose to be later described. In my preferred embodiment the roller 24 is suitably mounted longitudinally of said housing 28 preferably as in my preferred embodiment shown so that the outer end of the coil or roll 70 of my improved transparent storm window may depend immediately above the slot 68 and guideways 30 so that on a downward pull on the bar means 34 on the lower end of said window 20, the outer edges thereof may be drawn directly down said guideways 30.

I preferably also provide air seal means abutting each side of said flexible storm window within said housing, in my preferred embodiment comprising a stationary front roll 72 mounted longitudinally of said housing and a rear strip 74 mounted longitudinally of said housing each adapted to continuously abut and air seal respectively each side of said flexible window 20 within said housing 28.

In my preferred embodiment I also preferably mount a second roller 78 within said housing 28 preferably in front of said first roller 24 and I suitably form a roll or coil 80 thereon of flexible screening material 82 for use in the summer time. The lower end of said screening material 82 is preferably provided with the similar bar means 34' preferably also provided with the slidable rod means 38 for detachably locking the lower end of said screening 82 within said holes 46 in said guideways 30. As shown I have mounted the roller 78 so that the depending end of the screening 82 and its attached bar means 34' will depend in the supplemental housing 66 hitherto described when not in use. It is thus apparent when in the winter time it is desired to use my improved flexible transparent storm window it is merely necessary to reach to the upper end of said casing 66 to draw the suitable bar means 34 of said flexible transparent storm window downwards to completely cut off the air space 22 between said storm window 20 and permanent window 12, the transparent storm window 20 readily permitting ingress of sunshine and light to the room. If in the summer time it is desired, however, to use the roll screening 82 the bar 34 of the storm window is raised to position within said supplemental housing 66 and the bar 34' of the roll screen 82 may be readily grasped and moved downwards in the same guideways 30 so that the lower bar 34' thereof may be locked in a manner hitherto explained within the holes 46 in the lower ends of said guideways 30. It is thus apparent that I have provided within a single housing operable within a single guideway selective means to provide a storm window air insulating

space in the window, or to provide screening means in summer covering the whole window if it should be desired to remove the whole window altogether or to selectively open the upper or lower window sash. If desired, however, it is obvious that the housing 28 may be made smaller, of sufficient size to accommodate only one roller 24 and my improved transparent flexible storm window 20 and that the supplemental casing 66 may be dispensed with and the slot 68 narrowed to admit my improved flexible transparent storm window therethrough only. It is apparent therefore that if it is desired to use the storm window it is merely necessary to reach up and withdraw the bar means 34 down the guideways 30 and lock it in a manner hitherto explained and when the storm window is no longer desired it may be readily raised in the usual manner by means of the spring actuated roller 24 to a position opening the window casing and similarly in a manner hitherto explained in the summertime may the screening 82 be selectively lowered to a position closing with screening the window casement opening and similarly raised.

It is apparent therefore that I have provided a novel type of flexible transparent window constructed of transparent flexible material which may be readily coiled up out of view in this inconspicuous manner, constructed of a small number of simple parts and which may be mounted alternatively in the housing also including a window screening for summer use operable in the same guideways by the slight enlargement of the housing and the addition of the supplemental roller and the screening.

It is understood that my invention is not limited to the specific embodiments shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a building construction, a window casing, a window permanently mounted within said casing, a roller housing mounted in the upper end of said casing inside of said permanent window to form an air seal for the upper end of said casing, aligned air sealing guideway means mounted on each side wall of said casing below said housing spaced from said permanent window, rollers mounted in said housing, a flexible window screen member mounted on one of said rollers, a flexible transparent storm window member mounted on the other roller, bar means mounted on the lower ends of said flexible members, air seal means projecting downwardly from said flexible window member bar means, air seal means abutting each side of said flexible storm window within said housing, and means to secure each of said bar means to the lower end of said casing, said rollers being so spaced within said housing that said flexible members may be selectively lowered from said housing and the bar means thereof secured to the lower end of said casing, with said flexible storm window member being air sealed within said casing at a spaced distance from said permanent window to form an insulating air space therebetween.

2. In a building construction, a window casing, a window permanently mounted within said casing, a pair of spaced rigid resilient strips vertically mounted on each side wall of said casing, each having an inturned outer end spaced a slight distance from its respective pair end to form guideways on each side wall of said window casing spaced inwardly of said permanent window, resilient air sealing means mounted on each side of said guideways, a roller housing mounted against the upper end of said casing to form an air seal for the upper end of said casing, a roller mounted on said housing, a flexible transparent storm window member mounted on said roller and flexible means mounted within said housing adapted to continuously abut and air seal each side of said flexible window, whereby said flexible member may be lowered from said housing and secured to the lower end of said casing, with said flexible storm window member being air sealed within said casing at a spaced distance from said permanent window to form an insulating air space therebetween.

EDWARD E. BENSON.