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A. D. GREENE

2,321,078

FLEXIBLE STORM WINDOW

Filed Feb. 15, 1940

FIG. 1

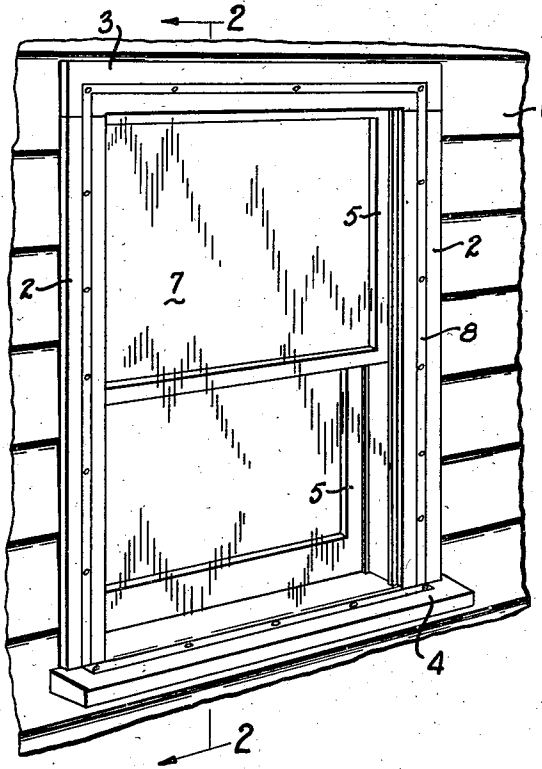


FIG. 2

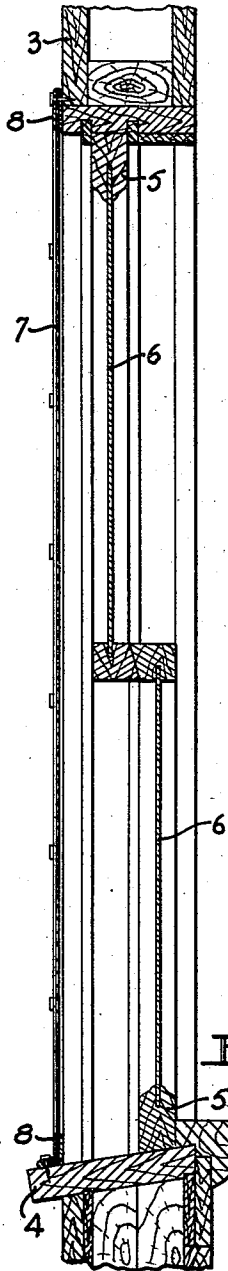


FIG. 3

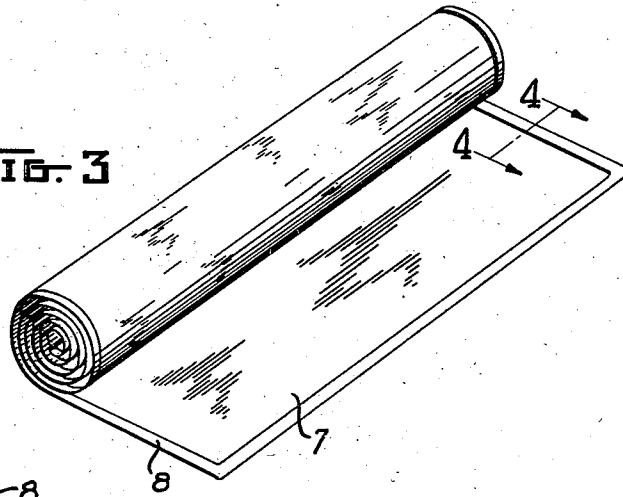
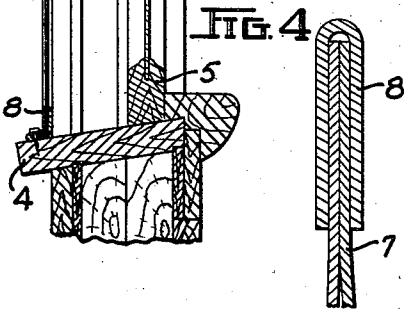


FIG. 4



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## FLEXIBLE STORM WINDOW

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Application February 15, 1940, Serial No. 319,048

1 Claim. (Cl. 160—354)

The present invention relates to storm protectors and more particularly to storm windows.

Double window construction in the past has been fairly expensive due to the fact that glass or other nonflexible transparent material was employed for the light admitting body and since this glass was of a highly shatterable character, the frame containing the window was necessarily a very rigid and heavy construction. This frame entailed a great deal of expensive mill work so that the window as a whole was quite expensive and few home owners were able to equip their homes with double window protection, particularly in the case of houses having a large number of windows. Other disadvantages are present in the case of the rigid form of storm window, in that the window is necessarily of a bulky character so that the storing of such windows during the summer becomes quite a problem. Moreover, due to the considerable weight of the prior art window with its heavy wooden frame, the work of installing a number of windows about a house and removing the same for storage is considerable.

An object of the present invention is to provide a storm window of a flexible character which may be either mounted on a light frame or secured directly to the casement of an ordinary window.

Another object is to provide a storm window which can be readily cut to size and is inexpensive and takes up a minimum amount of space during the storage periods.

It is still a further object of the invention to provide a storm window which is so inexpensive as to be merchandised through the popular priced chain stores and is of such a compact nature and of light weight that the improved window may be displayed on the ordinary counters for sale.

Still another object is to provide an improved storm window which may be satisfactorily mounted either on the exterior or the interior of an ordinary window casement and in either place will have an attractive appearance. The flexibility of the improved window is so marked that it is practically unshatterable due to vibrations caused by explosions, earthquake, etc.

The general object of the invention is to provide inexpensive double window construction so that every home can afford the protection and savings of double window construction which has proven to give real home comfort, in addition to great savings in fuel cost.

Other objects and features will be apparent as

the specification is perused in connection with the accompanying drawing, in which,

Fig. 1 is a fragmentary perspective view of an ordinary window casement provided with the improved storm window secured to the exterior of that casement.

Fig. 2 is a cross-sectional view taken along line 2—2 in Fig. 1 and looking in the direction of the arrows.

Fig. 3 is a perspective view of the improved storm window formed as a roll, in which shape it would normally be sold in the stores.

Fig. 4 is a fragmentary cross-sectional view taken along line 4—4 of Fig. 3.

Referring to Figs. 1, 2, and 3 of the drawing, numeral 1 designates the clapboard exterior of a house which is provided with an ordinary window casement or frame, the vertical members of which are indicated at 2 and the upper horizontal member 3 and the lower ledge at 4. This casement furnishes the support for an ordinary window construction including the window frames 5 which are slidable in the vertical direction and mounted on pulleys with counterweights. Sheets of glass 6 (Fig. 2) are held in frames 5 in any suitable and well-known manner.

In order to provide a dead air space immediately adjacent the exterior of the glass pane 6, it has been customary to employ sheets of glass or other inflexible transparent material surrounded by a heavy wooden frame, which frame was detachably secured to the casement elements 2, 3 and resting on the ledge 4. Storm windows of this character are not only very expensive since usually they are made to order depending upon the size of the window, but also are of heavy construction, making it a real task to install. However, in accordance with the present invention, there is provided a storm window which has none of these disadvantages.

As shown more clearly in Figs. 3 and 4, the improved window takes the form of a flexible transparent material indicated at 7, cut to the proper size and bound or bordered around its edge by a material 8 which may or may not be transparent but which is highly resistant to tear and is of a strong, tough character. The transparent window portion is preferably made of a cellulose material or derivative which is not only elastic and transparent but also heat resistant, water- oil-soluble, and gastight. Among the number of materials on the market which have these characteristics, a material which is obtained by the precipitation of a viscose solution with ammonia salts and sold under the trade

name of "Cellophane" or "Celanese" has been found to be satisfactory for the purpose stated. Another material of this character which may also be employed is a transparent paper sold under the names of "Transparit," "Sylphrap" and "Kodapak," all of which constitute a thin film of transparent cellulose material. The Cellophane is usually made waterproof and moisture-proof by passing the sheet obtained from the viscose solution after the glycerine bath, through a bath consisting of a dilute lacquer solution with rather volatile solvents such as ethyl-acetate. Other materials of this character are similarly rendered water and moisture-proof. After the sheet of flexible, transparent material has been cut to size, the binding 8 is applied and this binding may be constituted of rubber, rubberized cloth, tape (adhesive, friction, rubber or metal), the binding material being caused to adhere to the transparent material 7 by gluing, pasting, vulcanizing, or sewing. This binding material is of a strong and tenacious character and is not only resistant to tear but also provides a surface through which tacks or nails can be driven for holding purposes or in which slots or other opening may be provided.

In order to increase the protection from storm afforded by the transparent, flexible material, it may be desirable to employ two or more layers or sheets of the Cellophane, these sheets being entirely free of one another except at the edges where they are secured together by the binding material 8. By providing more than one thickness of the material 7, as can be readily seen in Fig. 4, a thin layer of dead air is entrapped between the sheets of Cellophane and this air layer adds its heat and cold insulating properties to those of the Cellophane. The fact that the layers of Cellophane may be separated by a small air space throughout considerable portions of their surfacial area does not detract in the slightest from the transparency of the material.

The improved storm window would normally be sold in the stores as a miniature roll with the edges all bound in the manner described above, and cut to size. Due to the extreme flexibility of the material 7, this roll may be of quite small diameter, notwithstanding the fact that it is adapted to cover a considerably sized window. Consequently, large numbers of the windows may be displayed or stored in relatively small spaces. Since the material is quite light (in weight), each window roll may be easily handled.

For applying the improved storm window to

the outside frame of a window casement, it is preferable to provide a window of such dimensions that it will extend approximately half way over the vertical and horizontal members of the window casement. The bound edges 8 may be secured to the casement in any suitable manner, for example by tacking, pasting, gluing, vulcanizing, or, if desired, detachable fastening means may be employed such as vacuum cups or a screw eye arrangement.

When installing the window, care should be taken to hold the transparent material as tight as possible but without strain because greater strength will be afforded by the window to severe rain and wind storms under these conditions. As in the case of the glass form of storm window which the present improved window is intended to displace, a column of dead air is maintained between the transparent material 7 and the glass windows 6 which prevents heat from within the house from escaping and also prevents cold from without from entering through the windows.

The Cellophane form of storm window, as described, offers practically all of the advantages of the glass form of storm window and yet eliminates many of its disadvantages. For example, the improved window may be readily cleaned in place, as in the case of the glass window, and is able to withstand, particularly where more than one layer of Cellophane is employed, as much stress laterally against the window as for example by a severe rain storm, as in the case of glass. The window in its rolled form may easily be carried up ladders and readily secured in place in any of the ways referred to above.

I wish it to be understood that I intend to include as within my invention such modifications and adaptations thereof as will be obvious to those skilled in the art and as fall within the terms or the spirit of the appended claim.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

As an article of manufacture, a self-supported roll consisting of a plurality of spaced sheets of Cellophane hermetically secured together at the edges and providing a dead air space between the unsecured surfaces of the sheets whereby the roll is adapted, when unrolled, to be fastened at the secured edges over an opening in a house to serve as a storm window.

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