United States Patent [19]

Goss, Jr. et al.

[11] **3,908,730**

[45] **Sept. 30, 1975**

[54] **STORM WINDOW**

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[73] Assignee: **Capitol Products,** Mechanicsburg, Pa.

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[21] Appl. No.: **460,693**

[52] **U.S. Cl.** **160/90;** 49/63; 49/455; 49/465

[51] **Int. Cl.²** **E06B 3/32**

[58] **Field of Search** 49/63, 61, 421, 404, 49/449–451, 453–454, 465, 428, 437, 438, 455; 160/89, 90, 91, 87

[56] **References Cited**

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3,462,884	8/1969	Bissoniere	49/404
3,587,705	6/1971	Zappone	160/91
3,837,118	9/1974	Goss, Jr. et al.	49/453 X

Primary Examiner—Philip C. Kannan

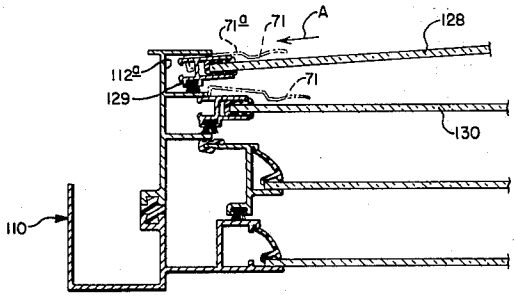
Attorney, Agent, or Firm—Donald L. Johnson; John F. Sieberth; Paul H. Leonard

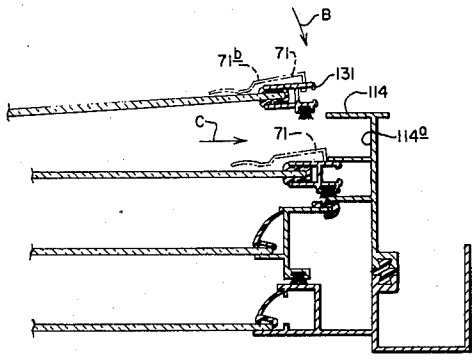
[57] **ABSTRACT**

A storm window for single or double hung windows including flush storm sash track in window jambs, movable guide spring assemblies at each end of the top and bottom of each sash and interchangeable upper and lower storm sashes.

The window construction is especially adapted for an interior hung storm sash system, but may also be constructed as an exterior hung storm sash system.

12 Claims, 6 Drawing Figures





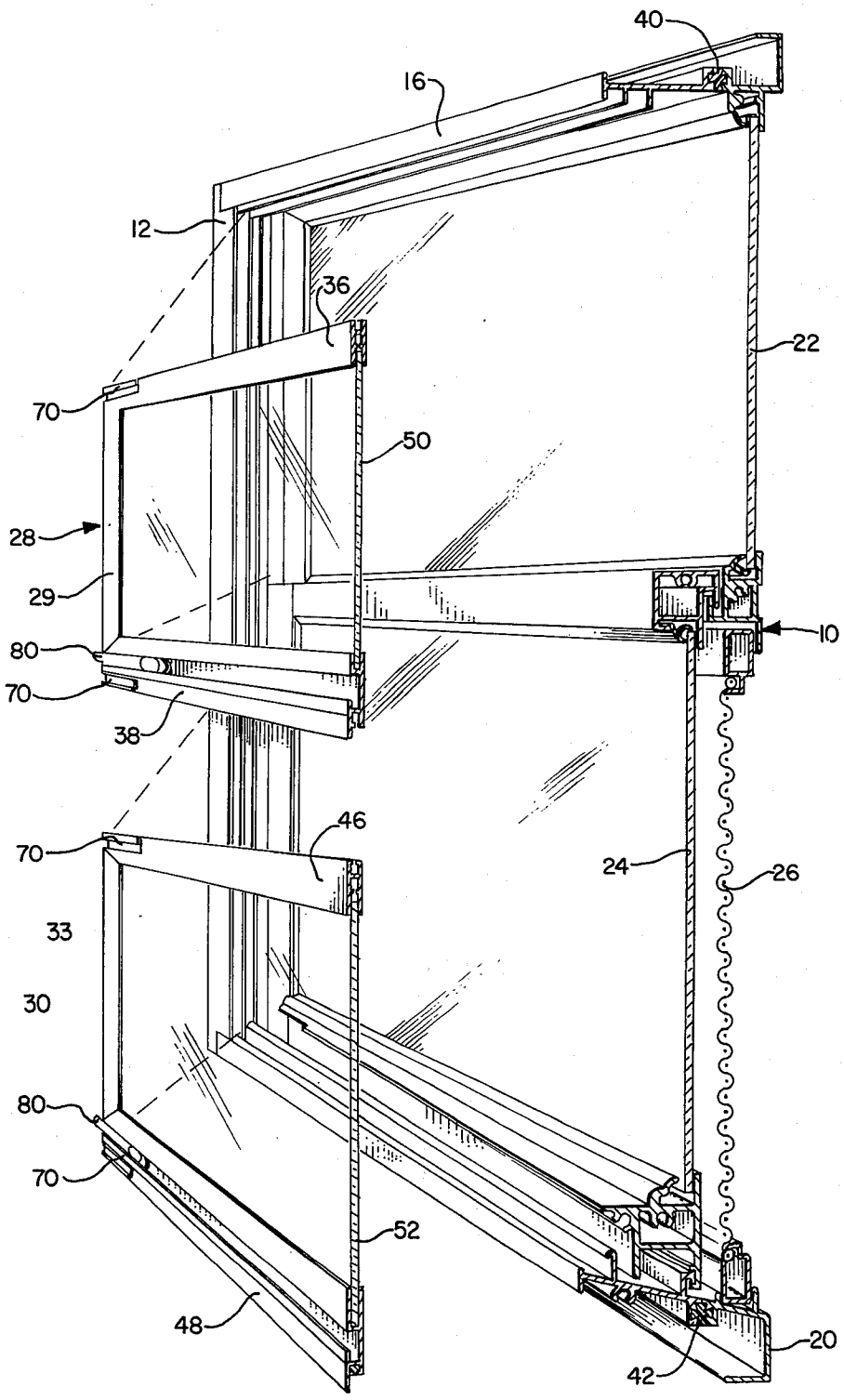

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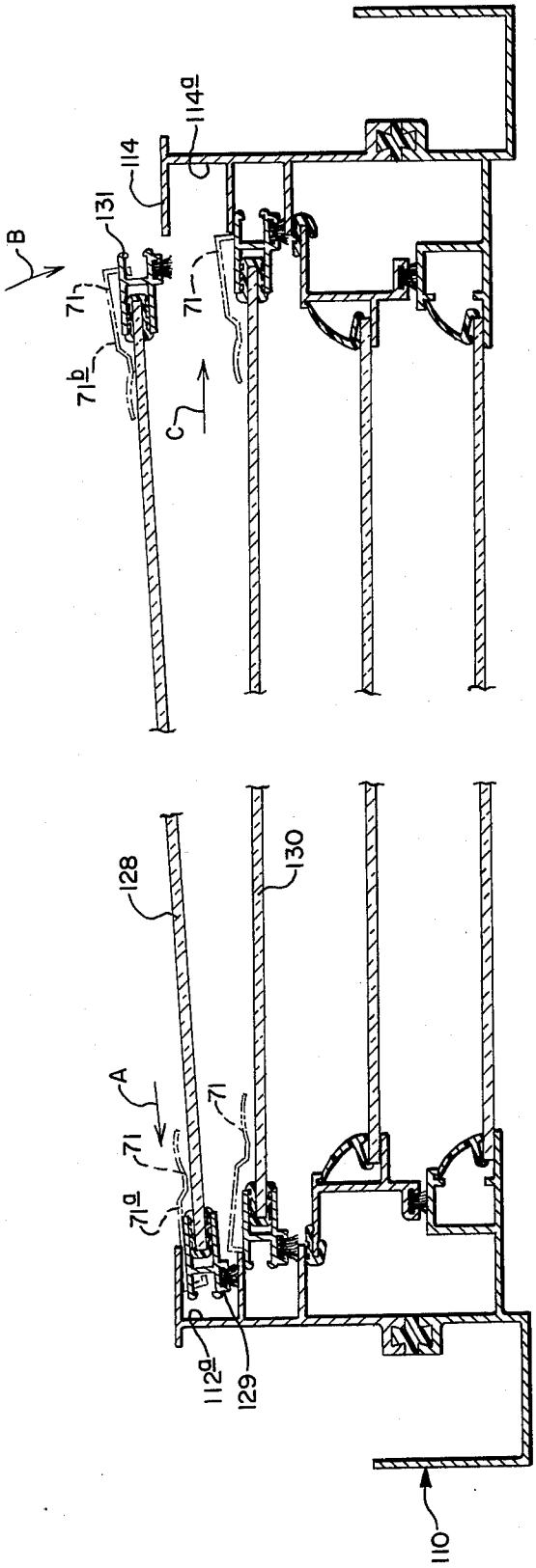
FIG. 1.


B
131
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C
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FIG. 2.

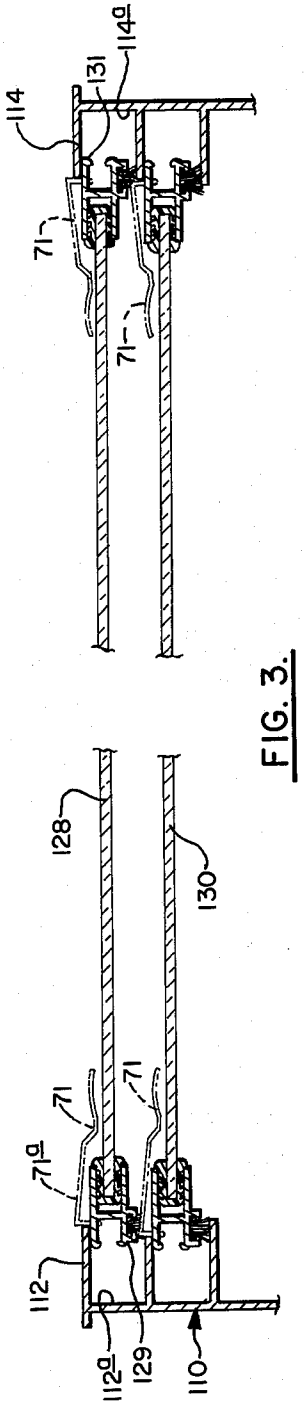
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FIG. 3.

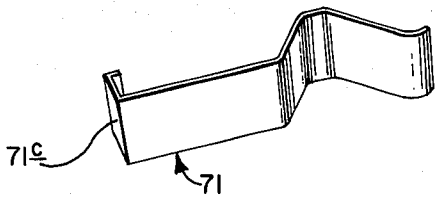

FIG. 5.

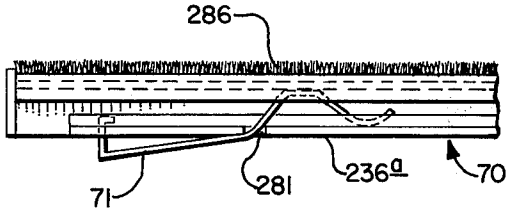

FIG. 6.

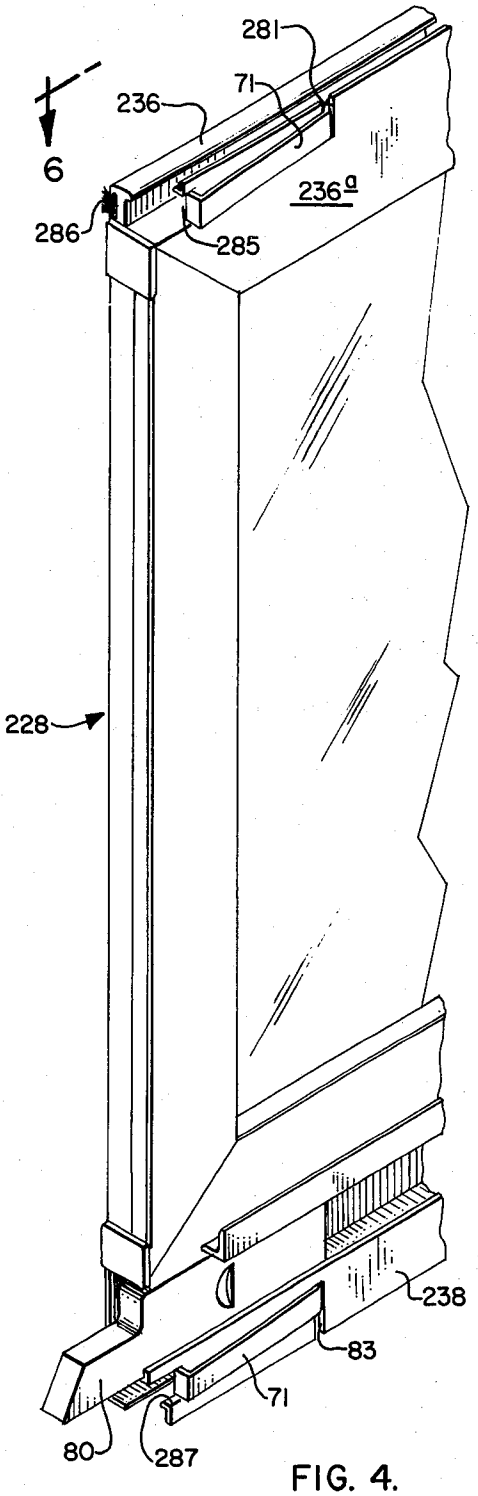

FIG. 4.

STORM WINDOW

BACKGROUND OF THE INVENTION

The present invention is in the building construction field and particularly relates to windows, especially metal windows having removable storm sashes.

Single and double hung windows and such windows containing removable sashes and storm sashes are well known in the art. U.S. Pat. Nos. **3,676,956** and **3,358,404** are illustrative of single and double-hung windows having sashes removable from a window casing. U.S. Pat. No. **3,587,705** is representative of a multi-track or five-track storm window having two storm panels, two glass panels and a screen panel all removable from the window frame. Other types of storm windows or prior art window constructions are shown in U.S. Pat. Nos. **2,589,685; 2,611,934; 2,631,340; 2,640,535; 2,654,920; 2,711,789; 2,760,607; 2,812,812; 3,080,620; 3,080,621; 3,083,419; 3,239,976** and **3,462,884.**

The instant invention provides an interior or exterior hung storm sash system wherein the sashes are installed in a flush track in a window jamb. Such a flush track system provides an esthetically superior appearance over prior art windows. It is particularly an improvement of the window construction of U.S. application Ser. No. **356,465,** now U.S. Pat. No. **3,837,118.**

Customarily, upper and lower storm sashes of the track type have each been of different sizes. The present invention enables the upper storm sash and the lower storm sash to be interchangeable thus facilitating manufacture thereof and improving the overall appearance of the window.

Prior art storm sash systems have employed a fixed metal tab which must be carefully fitted into offset track systems. The present invention provides a movable guide spring assembly at each end of the top and bottom of each sash which enables either the upper or lower sash to be quickly and easily removed from the window or installed therein.

The invention is also adaptable to conventional three-track storm windows. Easier removal of the storm sashes are necessity of going outside. The advantages of this are readily apparent. provided and improved appearance of the window is obtained.

Most storm windows have exterior hung sashes. This requires going outside of the building in order to install or remove the store sashes. The present invention provides an interior hung storm sash system which enables the storm sashes to be completely handled from inside the building without the necessity of going outside. The advantages of this are readily apparent.

It is, therefore, a primary object of the present invention to provide a new and improved interior or exterior hung storm sash system in which the storm sashes can be readily and easily installed or removed and which is attractive.

Another object of the present invention is to provide a novel guide spring assembly for storm window sashes which enables the sashes to be readily installed and easily removed.

Still another object of the instant invention is to provide a new and improved method of installing and removing storm sashes.

Other objects and advantages of the invention will become apparent from a consideration of the description and drawings hereinafter.

SUMMARY OF THE INVENTION

The storm window of the present invention includes an interior or exterior hung storm sash system with the storm sashes being installed in a flush track in the window jambs. A movable guide spring assembly at the top and bottom of each storm sash on each side thereof facilitates installation and removal. The guide spring assembly incorporates a uniquely designed spring which has preferably been passivated and hardened for maximum spring qualities. The assembly is fixed into the top rail and bottom rail of each storm sash and on each side thereof which meets the window jamb. The bottom of the storm sash is further attached with a metal catch. Preferably the upper storm sash and the lower sash are of the same size. The windows are also preferably constructed of extruded aluminum or aluminum alloy.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view partly in section of a complete flush track window assembly or storm sash system viewed from the interior side showing the storm sashes just prior to installation therein;

FIG. **2** is a horizontal section of a storm window assembly illustrating the guide spring assemblies therein with an interior storm sash being installed in the storm track;

FIG. **3** is a horizontal sectional view of a partial section of the window and sash similar to FIG. **2,** illustrating the guide springs and storm sashes in a closed or installed position in the storm track;

FIG. **4** is a perspective view of a portion of a storm sash illustrating the upper and lower sash assembly with the guide spring assemblies in an open position;

FIG. **5** is a perspective view of a storm sash guide spring;

and

FIG. **6** is a top view illustrating the guide spring assembly in a storm sash.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The window assembly or storm sash system of the present invention is adapted to fit in a rough opening in a house or other building. The window may be either single hung or double hung, but is conventionally a single hung three or four track or multiple track system. The window may be constructed so as to provide either an interior or exterior hung storm sash system.

Referring now to the drawing and more particularly to FIG. **1,** an interior hung flush track storm sash system is shown. The window or window casing or assembly is illustrated generally at **10** and incorporates side jambs **12** and **14** (not shown) connected to a head frame **16** and a sill frame **20** to form the generally rectangular casing construction. The side jambs, head and sill frames are preferably made of an extruded aluminum or aluminum alloy. The parts are held together in a conventional manner using screws or other suitable fasteners. The window **10** additionally includes a fixed upper sash or glass panel **22,** a movable or slidable lower sash or glass panel **24,** and optionally a screen panel **26** exterior of and adjacent the lower panel **24.** The glass and screen panels are mounted in a conventional manner. The upper sash **22** can be movably installed if desired. Finally, the window **10** includes an upper storm sash **28** and a lower storm sash **30** adapted

to fit on the interior side of the window **10** adjacent the upper and lower sashes **22** and **24.**

The head, sill and jambs or window frame members are so constructed as to provide suitable tracks for the upper fixed sash, the lower movable sash, the screen panel, the upper storm sash and the lower storm sash. These frame members are preferably of a thermal barrier or thermal break design. One type of plastic thermal barrier is seen at **40** and **42,** respectively. The side jambs **12** and **14** are also constructed of a similar thermal break or barrier (not seen). The thermal break is preferably constructed of virgin vinyl. Other suitable materials may be used. The thermal break may also be omitted from the window construction, if desired, or not required.

The upper and lower storm sashes **28** and **30** are essentially identical and are interchangeable. The upper sash **28** has side rails or stiles **29** and **31** (not shown) which are connected at their ends by the upper and lower rail members **36** and **38,** respectively. The lower sash **30** has side rails or stiles **33** and **35** (not shown) which are connected at their ends by the upper and lower rail members **46** and **48,** respectively. The storm panels **28** and **30** each include a glass pane **50** and **52,** respectively.

The upper and lower storm sashes **28** and **30** are equipped with guide spring assemblies **70** mounted in the upper rails **36** and **46** on each end thereof and in the lower rails **38** and **48** on each end thereof. The guide spring assembly is described in detail hereinafter. The upper sash **28** has guide spring assemblies **70** mounted at the top thereof. The assemblies **70** are fixed into each side of the top rail **36** and the bottom rail **38** for meeting the side jambs **12** and **14,** respectively. Each guide spring assembly incorporates a guide spring **71** of FIG. **5.** Guide spring assemblies **70** are similarly fixed on each side of the top rail **46** and bottom rail **48** of the lower sash **30.**

Standard spring loaded finger latches **80** are attached to each end of the bottom rails **38** and **48,** respectively of the upper and lower sashes **28** and **30,** respectively, just above the guide spring assemblies.

It is readily seen that each storm sash, either upper or lower one is substantially identical and each sash has a guide spring assembly on each end of its top rail and on each end of its bottom rail.

Referring now to FIGS. **2** and **3,** a four track storm window assembly **110** is illustrated in horizontal section. In FIG. **2,** one storm sash **128** is shown in a partially installed position. The other storm sash **130** is shown in a fully installed position. In FIG. **3,** both storm sashes **128** and **130** are seen in their installed positions.

To install a storm sash in a window frame, one stile of the storm sash is placed into a jamb track while simultaneously depressing a guide spring on the top rail of the sash and exerting a force toward the jamb track. The bottom rail guide spring is then depressed enabling the sash to enter the jamb track its full depth. The other stile of the storm sash is swung into position and placed in the opposite jamb track of the window. With the stile aligned with the jamb track, the storm sash is moved in the direction of the opposite jamb track until the guide spring stops against the jamb. The guide springs on the opposite side then pop out to retain the storm sash within both jamb tracks.

In FIG. **2** for example, the stile **129** of the storm sash **128** is placed into the jamb track **112**a while exerting a force sideways in the direction indicated by arrow A and depressing the guide spring **71***a* on the top rail. Similarly, the guide spring on the bottom rail opposite the guide spring **71***a* on the top rail is depressed. The sash **128** is then permitted to enter the jamb track **112***a* a sufficient depth to permit the sash **128** to be swung or moved in the direction of the arrow B until the stile **131** is aligned with the opposite jamb track **114***a*. The sash **128** is moved in the direction indicated by arrow C until the upper guide spring **71***b* on the top rail and the lower guide spring on the bottom rail stop against the jamb **114** as seen in FIG. **3.** Upper guide spring **71***a* and the lower guide spring opposite thereof then pop out in position adjacent the jamb **112** also as seen in FIG. **3.** The storm sash is thus retained within jamb tracks **112***a* and **114***a*.

To remove a storm sash, the procedure is similar. For example, the guide spring **71***a* is depressed and the sash **128** is moved toward the jamb track **112***a* until the stile **131** clears the jamb **114.** Similarly, the opposite lower guide spring is depressed and the sash moved until the stile **131** clears the jamb **114.** The sash **128** is then swung outwardly in a direction opposite that of arrow B in the position shown in FIG. **2.** The sash **128** is then moved away from the jamb track **112***a* and removed from the window **110.**

The guide spring assembly **70** and guide spring **71** are more clearly seen in FIGS. **5, 6** and **7.** The spring **71** is preferably of a design as illustrated in FIG. **5.** It is also preferably made of spring steel which has been passivated and hardened for maximum spring qualities. The end **71***c* of the spring **71** adapted to be located near the end of the stile and in contact with the jamb is preferably coated with nylon, Teflon plastic or the like. The entire spring may be coated if desired.

The guide spring assembly **70** is formed in each end of the top rail **236** and bottom rail **238.** Thus each sash contains four guide spring assemblies **70.** A notch or slot **281** is located in one side **236***a* of the top rail **236** of the sash **228** for receiving the spring **71** as seen in FIGS. **6** and **7.** A similar notch **83** is located in the bottom rail **238** for receiving a spring **71.** The top rail **236** has a second slot **285** therein for receiving the lower end **71**c of the spring **70.** A similar slot **287** is located in the bottom rail. The guide spring assemblies **70** on each end of the top rail and bottom rail of each sash are substantially identical. A sash pile **286** preferably of nylon or other similar material is attached to the rails **236** and **238** by adhesives or other suitable means. Although the particular configuration of the spring **70** may be varied somewhat, it is preferably of the configurations as shown in FIG. **5.** The end **71***a* must also be so constructed that it is adjacent the slot formed to receive it and must be so located in the rail that the end of the guide spring in each end of a rail is adjacent the jamb track when in an installed position as best seen in FIG. **3.**

In installing and removing the storm sashes, the spring loaded thumb latch **80** must also be moved inwardly a sufficient amount to enable the stiles to be inserted in the jamb tracks.

Upper and lower sashes are similarly installed and removed.

The present invention provides an aluminum single-hung window that not only is attractive but can easily be installed. In the most preferred form of the invention, a virgin vinyl thermal break frame keeps the cold

on the outside and the warmth inside. An outside box frame affords easy, labor saving installation and provides its own attractive trim. The trim may be colored or plain as desired. Aluminum, self-locking latches are conveniently located in the removable bottom panel. Hidden, direct, block and pulley-type sash balances recessed in both jamb sections provide smooth, effortless panel operation. A sloped frame sill with weep holes flows moisture to the outside of the windows. Interior, operable storm sash panels offer variable vent positioning. An outside half-screen that installs from inside a room may also be added. Glazing may be of single or double strength glass, as preferred. Vinyl bead glazing and full woven file weather stripping assure maximum weather resistance.

Although the window of the present invention can be constructed of any suitable metal, aluminum and aluminum alloys are preferred. Aluminum alloy **6063–T5** is particularly preferred. The frame and sash are preferably made of extruded aluminum alloy with standard commercial tolerances. Weather stripping is preferable extruded vinyl in the sash bottom rail and polypile on stiles and meeting rail. Rigid type vinyl is normally used in the glazing area of the fixed lite and moving sash.

The inside storm sashes have extruded full aluminum frames with center rail overlap in two tracks. Glazing is with channel type soft vinyl suitable for reglazing. Corners of sashes are secured with spring steel corner clips or die cast corner keys. Glide tracks are extruded in jambs and head of inner window section to seal and guide for sliding of storm sash. Stiles and top rail of sash frame are weather stripped with polypile. The sashes are readily slidable and removable without the use of any tools. The top and bottom sash are identical and interchangeable and have spring retractable steel and nylon top guide pins and spring loaded die cast bottom latches. Three position ramps are located in jamb for lower sash.

Although the present invention is illustrated and described primarily with regard to an interior hung storm sash system, it is readily adaptable to an exterior hung storm sash system. It is only necessary that the window frame be so constructed that the sashes fit in appropriate tracks so as to be on the exterior side of the window. The construction of the storm sashes is substantially identical for either interior or exterior hanging.

The foregoing disclosure and description of the invention is illustrative and explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. A storm window or window assembly comprising a frame adapted to be installed in an opening in a building or wall; said frame being of a generally rectangular construction including a head frame, a sill frame and side jambs connected thereto, an upper sash and a lower sash mounted in said frame; an upper storm sash and a lower storm sash mounted in said frame; said head frame, sill frame and side jambs having tracks therein for receiving said upper and lower sashes and said upper and lower storm sashes; each of said storm sashes including a top rail, a bottom rail and stiles connected thereto; a guide spring assembly on each end of said top rails and each end of said bottom rails for releaseably connecting said storm sashes to said side jambs of said frame each of said guide spring assemblies comprising a guide spring and spring receiving and retaining means, said spring receiving and retaining means includng a pair of slots fixed in each end of said top rails and in each end of said bottom rails, each of said guide springs being mounted in said spring receiving and retaining means therefor so as to be depressible from a position externally of the rail thereon to a position inwardly towards said rail, thereby enabling said storm sashes to be positioned in or removed from said tracks therefor, said pair of slots in each end of said top rails and each end of said bottom rails being so positioned in said rails and said guide springs being so positioned in their respective slots that when said storm sashes are installed in said tracks therefor and said guide springs are in their normal relaxed position, the edge of each of said guide springs facing their respective side jambs abuts an edge of a track member forming a side of said tracks for said storm sashes.

2. A storm window as defined in claim **1** wherein said upper sash and said lower sash are interchangeable.

3. A storm window as defined in claim **1** wherein said upper storm sash and said lower storm sash are positioned in the same tracks of said head frame, said sill frame and said side jambs thereby providing a substantially flush mounting of said storm sashes in said frame.

4. A storm window as defined in claim **1** wherein said upper and lower storm sashes are installed in said frame so as to be on the interior side of the window when the window is mounted in a wall or the like and are readily removable from said interior side.

5. A storm window as defined in claim **1** wherein tracks are provided in said frame for receiving screen means and screen means are installed in said tracks.

6. A storm window as defined in claim **1** wherein said upper and lower storm sashes have a latch means on each end of the bottom rails thereof above each of said guide spring assemblies for engagement in the tracks of said side jambs of said frame.

7. A storm window as defined in claim **1** wherein said upper sash is fixed in said frame and said lower sash is slidable in said frame.

8. In a storm sash having a top rail, a bottom rail and stiles joined thereto for forming a rectangular frame with a panel mounted therein, a guide spring assembly means mounted on each end of the top rail and each end of the bottom rail for releaseably connecting the storm sash in a track in each side jamb of a window frame, said guide spring assembly means comprising a guide spring and spring receiving and retaining means mounted on each end of the top rail and each end of the bottom rail, said spring receiving and retaining means including a pair of slots fixed in each end of said top rail and in each end of said bottom rail, said guide springs being mounted in each of said spring receiving and retaining means so as to be movable in a direction towards the rail mounted therein, thereby enabling said storm sash to be positioned in the tracks in the side jambs of the window frame therefor, said pair of slots in each end of said top rail and each end of said bottom rail being so positioned in said rails and said guide springs being so positioned in said slots therefor that when said storm sash is installed in the tracks in the side jambs of the window frame therefor and said guide springs are in their normal relaxed position, the edge of each of said guide springs facing the tracks in the side jambs of the window frame therefor abuts an edge of

a track member forming a side of said tracks for said storm sash.

9. The storm sash of claim **8** wherein said bottom rail has a latch means on each end thereof above each of said guide spring assembly means for releasably locking said storm sash in a side jamb of a window frame.

10. A guide spring assembly on an end of a rail of a window sash, comprising a guide spring and spring receiving and retaining means on said end of said rail, said spring receiving and retaining means comprising a pair of slots fixed in said end of said rail, said guide spring being mounted in said spring receiving and retaining means so as to be depressed from a position externally of said rail to a position inwardly towards said rail, thereby enabling said end of said rail to be positioned in or removed from a track or receiving channel therefor, said pair of slots being so positioned in said end of said rail and said guide spring being so positioned in said pair of slots that when said end of said rail is positioned in the track or receiving channel therefor and said guide spring is in a normal relaxed position, the edge of said guide spring facing said track or receiving channel abuts an edge of a member forming a side of said track or receiving channel.

11. The guide spring assembly of claim **10,** wherein said guide spring is a unitary member and has an angularly disposed flange on end thereof engaging the outermost slot of said pair of slots and an angularly disposed portion on the other end thereof inserted in the other slot of said pair of slots.

12. The guide spring assembly of claim **10,** wherein said guide spring is a unitary member having an angularly disposed flange on one end thereof and an angularly disposed end portion on the other end thereof.

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