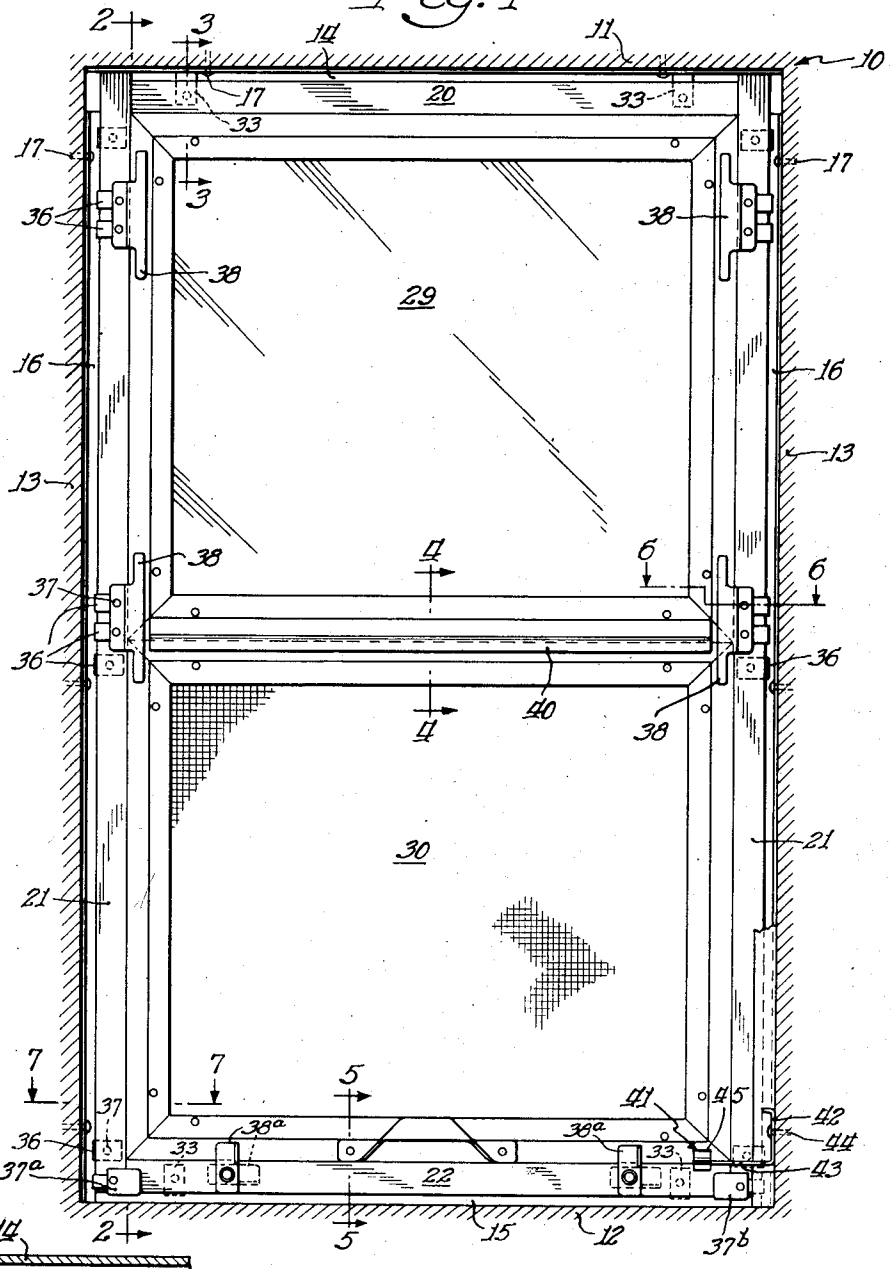
Oct. 6, 1953 G. W. DAY 2,654,128

STORM WINDOW

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Fig. 1



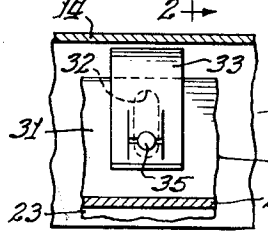


Fig. 8

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STORM WINDOW

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Fig. 2

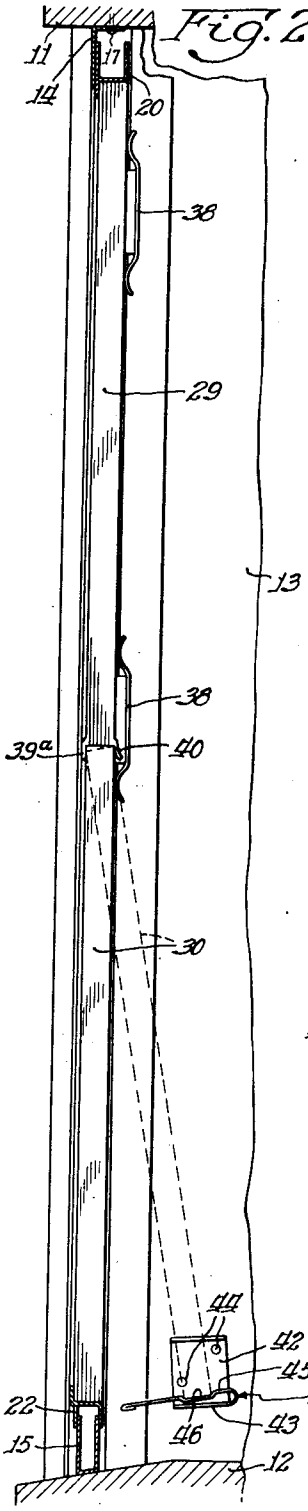


Fig. 3

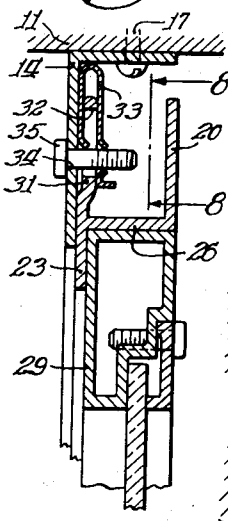


Fig. 6

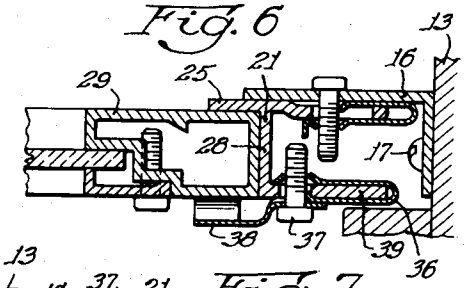


Fig. 7

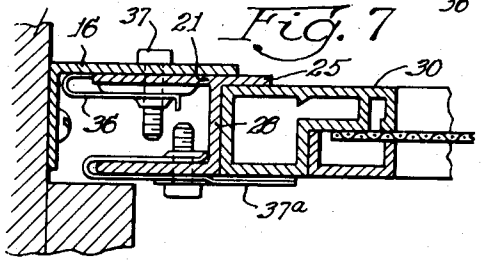


Fig. 4

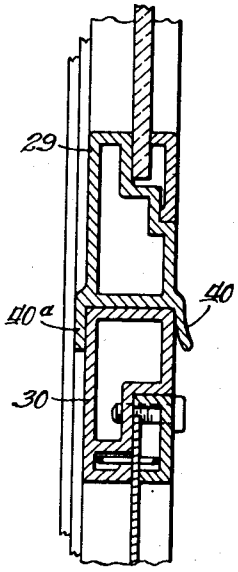
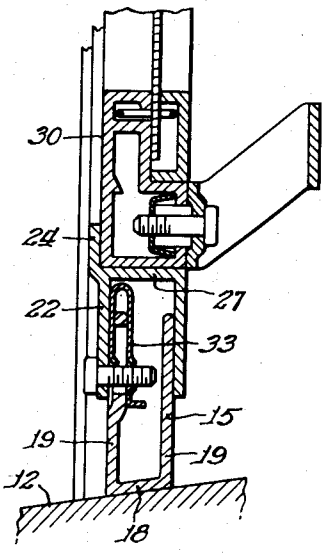


Fig. 5



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UNITED STATES PATENT OFFICE

2,654,128

STORM WINDOW

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Application March 24, 1947, Serial No. 736,723

5 Claims. (Cl. 20—55)

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This invention relates to combination storm and screen sashes and more particularly to an adjustable sash for supporting seasonably interchangeable screen and glass panels in accordance with climatic or weather conditions and a method of assembling the sash and installing the sash in a conventional window frame of a building.

The primary object of the invention is to provide a metal shash of the type adapted to be installed in conventional building aperture frames and which is adjustable in width and height to fit a wide variety of aperture dimensions and also to adapt the sash to aperture frames that are out of plumb or not square.

A further object of the invention is to provide a storm and screen sash of simple construction, inexpensive to manufacture and which can be economically shipped and stored in disassembled condition and readily and quickly assembled at the job by unskilled workmen without the use of special tools or equipment.

A further object of the invention is to provide a sash of the type mentioned above comprising a screen or glass panel-holding frame constructed of adjustable parts disposed between the screen or glass panels and the conventional building aperture frame and effective to form a weather-tight and wind-arresting seal in conjunction therewith.

A still further object of the invention is to provide a combination storm and screen sash which, when assembled with conventional window aperture frames, affords a neat and attractive appearance from the inside and outside.

A further object of the invention is to provide a sash of the type mentioned having improved means for retaining an associated storm window in a ventilating position.

A further object of the invention is to provide a screen and storm window-retaining frame comprising relatively adjustable parts including top and sill members adapted to function as templates with respect to side members of the frame to maintain the latter in predetermined spaced parallel relation corresponding to the width of the screen or storm windows to provide a close fit while preventing binding of the storm or screen panels during assembly and disassembly with the frame.

These and other objects and features will become apparent from a study of the following description and accompanying drawings in which like parts are designated by like reference characters, and in which:

Fig. 1 is a front inside elevational view of a

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sash embodying the invention installed in a conventional building aperture frame;

Fig. 2 is a sectional view of the sash and the building aperture frame structure taken along the line 2—2 of Fig. 1, the dotted lines indicating the disposition of the lower panel in its ventilating position;

Fig. 3 is an enlarged sectional view taken along the line 3—3 of Fig. 1;

Fig. 4 is an enlarged sectional view taken along the line 4—4 of Fig. 1;

Fig. 5 is an enlarged sectional view taken along the line 5—5 of Fig. 1;

Fig. 6 is an enlarged section taken along the line 6—6 of Fig. 1;

Fig. 7 is an enlarged section taken along the line 7—7 of Fig. 1; and

Fig. 8 is a sectional view taken on line 8—8 of Fig. 3 and illustrating the manner of maintaining the adjustable frame of the present invention in its adjusted position.

These drawings are to be understood as being more or less of a schematic character for the purpose of disclosing a typical or preferred embodiment of the improvements contemplated herein, and in these drawings like reference characters identify the same parts in the different views.

Referring to the drawings, the improved combination screen and storm sash of the present invention is adapted to be mounted in and secured to a conventional building aperture frame including the post structure 10 comprising top and sill sections 11 and 12 and side sections 13, 13.

The combination storm and screen sash assembly that embodies an illustrative part of the present invention, comprises a screen and window-panel receiving frame which is a metallic structure comprising the top and bottom rails or segments or adapters 14 and 15 and the vertical rails or side segments or adapters 16, 16. The top and side segments or angle members 14 and 16, 16 are of L-section as shown in Figs. 3, 6 and 7 and each adapter has one of the angularly disposed portions thereof firmly attached to the engaged portion of the post structure by screw 17 and the other outer angularly disposed portions of these segments project within the opening defined by the respective walls of the building aperture frame 10 for engagement with adjustable guide members as hereinafter described. The bottom or sill adapter 15 is of U-section as shown in Figs. 2 and 5, with the bottom wall 18, connecting the walls 19, 19 thereof, being inclined to seat against the sloping sill section 12 of the frame 10, the walls 19, 19 of the adapter co-act-

ing with an adjustable guide member as hereinafter described. It will be apparent from an inspection of Fig. 1 that the side rails 16 extend longitudinally of the window opening and from the top to the bottom thereof and also that the top and sill sections 14 and 15 extend for the entire width of the window opening in the frame 10.

Referring now to Figs. 3, 6 and 7, it will be noted that the top adapter 14 and side adapters 16, 16 have inwardly extending portions thereof mounting adjustable guide members 20 and 21, 21, respectively, and the sill member or adapter 15, as shown in Fig. 5, has the channel walls 19, 19 thereof telescopingly received within an adjustable guide member 22. The guide members 21, 21 extend co-extensively with the associated side adapters from the top to the bottom of the building aperture defined by the frame 10 and the top and bottom guides 20 and 22 extend substantially for the length of the associated top and bottom adapters 14 and 15 and have their opposite ends thereof in abutment with the side guides 21, 21 thus serving as templates to maintain the side guides in spaced parallel relation conforming to the widths of the associated glass and screen panels 29 and 30.

As clearly shown in the sectional views, each of the guide or channel members are of similar construction and are of H-section with the flange portion thereof extending inwardly from the channel-defining portion and forming a substantially continuous retaining strip about the inner margins of the panel-receiving frame for engagement with the upper storm window 29 and lower screen panel 30 to maintain the panels against outward movement, these flange portions of the top and bottom guides 20 and 22 being identified by the numerals 23 and 24 and the flange portions of the side guides being identified by the numerals 25, 25. Each of the guide members has a web connecting the parallel webs thereof and engaging the adjacent edge of the screen or glass panel for guidingly receiving and mounting the same, these connecting webs of the top and bottom guide members 20 and 24 being identified by the numerals 26 and 27, respectively, and the connecting webs of the side guides 21, 21, being identified by the numerals 28, 28.

It will be apparent the guide members 20, 21, 21 and 22 thus embrace and surround the upper glass panel 29 and the lower screen panel 30 to mount the same and to retain said panels against outward movement.

A feature of the present invention is to provide relative adjustment between the adapters, attached to the building aperture frame or post structure 10, and the guide members, mounting the screen and glass panels, to adapt the sash to conventional building aperture frames which vary in size and also for the case where such frames are of wooden construction and may be slightly deformed or out of square from settling of the building and from the weathering, warping, and the like of the wood of which the wooden window frame is made. To this end, each of the guide members 20 to 22 inclusive may be adjusted relative to the adapters by bodily sidewise movement to or from the associated adapter, as well as by tilting the guide member at an angle to the associated adapter, and thereafter securing these relatively adjustable members together in adjusted relationship. Each guide member may thus be adjusted relative to the associated adapter in the aforesaid manner after their assembly to space the side guide members

to engage the opposite ends of the top and bottom guide members whereby the side guide members will be positioned to engage the side edges of the panels 29 and 30, and also to space the top and bottom guide members a distance corresponding to the combined lengths of the panels to engage the top of the panel 29 and bottom of the panel 30.

The means maintaining each guide member and adapter in assembled relationship during such adjustment and to fix the same in their adjusted position will now be described.

Referring now to the top construction of my improved frame illustrating the feature of adjustability of the guide member 20 relative to the adapter 14 to obtain this desirable result, the guide member 20 as shown in Figs. 3 and 8 has an outer wall 31 thereof provided with a transverse slot 32 and a speed nut 33 of U-section, and preferably of spring material, receives therewithin the portion of the wall 31 defining the transverse slot 32 therein. The speed nut 33 is provided with annular openings in its spaced webs in alignment with the slot 32 in the wall 31 of the guide member 20 and an annular opening 34 in the engaged angle portion of the adapter 14 for receiving a bolt 35 extending through the opening 34 in the wall of the adapter 14, the slot 32 of the guide member wall 31 and the openings of the nut 33. It will be apparent that the bolt 35 will prevent relative movement of the nut 33 and adapter 14 while permitting bodily sidewise movement of the guide rail 20 relative to the adapter 14 as well as tilting movement of the guide rail relative to the adapter 14 in the plane of the frame to allow a considerable range of adjustment of the guide rail 20 relative to the adapter 14. After the desired adjustment of the guide member 20 relative to the adapter 14, the bolt 35 will securely hold the guide to the adapter inasmuch as the bolt 35, during rotation thereof, will, through its engagement with the flexible portions of the nut defining the openings therein, grip the nut to cause movement of the nut toward the adapter 14 and with it the guide 20. Upon completion of the inward movement of the bolt 35, the combined action of the bolt 35 and nut 33 will be effective to secure the guide member 20 and adapter 14 in fixed position preventing relative movement thereof.

Each of the side guides 21 may be similarly adjusted by bodily sidewise movement thereof and angular tilting thereof with respect to the associated adapter 16 for the purpose of securing a desired adjustment and, each guide 21 may be fixed in its adjusted position by a nut 36 and bolt 37 identical with that previously described and functioning in a similar manner to maintain the guide in a fixed position with respect to the associated adapter. However, the bottom adapter 15 and guide 22 are adjustably assembled by the nut 33 receiving therewithin the outer wall 19 of the adapter 15 and the bolt extends through the engaged outer walls of the adapter and guide member and the nut 33 as shown, the outer wall 19 of the guide member having a transverse elongate slot therein for allowing relative movement of the adapter and guide member.

The speed nuts are clamped on the top and side guide members and the bottom adapter prior to assembly of the guides with the adapters and, after assembly, the nuts are attached whereupon the aforesaid relative adjustment of the guides and adapters may be had. The nut and bolt as-

semblies can then be utilized to fix these members of the frame in their adjusted positions.

It will be apparent from the foregoing description regarding the features of the adjustability of the sash frame that the top, bottom and side adapters may be individually secured to the side and transverse walls of the casings of building apertures, such as the frame 10, which vary in spacing and angularity and thereafter the top and bottom guides as well as the side guides may be adjusted relative to their associated adapters by bodily sidewise movement of the guides relative to the associated adapters as well as tilting of the guides relative to the adapters in the plane of the frame to engage the outer edges of the panels whereby considerable flexibility is afforded between the guides and adapters to adapt the adjustable frame to different sizes of building aperture frame openings and to compensate for out-of-squareness of the building aperture frames.

As will be apparent from a consideration of Fig. 1, the assembled bottom or sill guide rail 22 and the adapter 15 are received between the side guide rails 21, 21, and are held against the flange portions 25, 25 of the side guide rails to prevent outward movement thereof and the adapter 15 is held against the sloping sill 12 of the frame 10 by clips 37*a* and 37*b* secured to the side guides as shown in Fig. 7 by bolt and speed nut arrangements identical to those utilized in securing each guide to its associated adapter whereby the sill adapter and guide rail will be prevented from movement inwardly from the frame.

It may be noted from a consideration of Fig. 1 that the top and bottom guide rails 20 and 22 are of the same length and correspond to the width of the glass panel 29 and the screen panel 30. The length of these guide rails are made to correspond to the widths of the panels prior to assembly with the other component parts of the adjustable frame so that when these guide rails are positioned in the relationship to the side guide rails as shown in Fig. 1, with their opposite ends abutting respective side rails they will serve as templates by their position between the side guide rails to maintain the side rails a fixed distance apart corresponding to the width of the panels so that, when the latter are adjusted in the frame, the side guide rails will, while snugly fitting the panels, prevent binding of the storm and screen panels during assembly and disassembly with respect to the frame.

The upper and lower panels 29 and 30 are positioned within the adjustable frame and are retained against the continuous retaining strip provided by the flange portions 23, 24, 24 and 25 of the guide rails and, constituting the inner margins of the frame, in a manner now to be described. The retaining means for the upper panel are the side spring members or clips 38 which as shown in Fig. 6 are secured to the inner side wall 39 of each of the side guide rails 21 by means of a speed nut and screw arrangement similar to those used in maintaining each adapter in fixed assembled relation with its associated guide rail. The resilient spring clips 38 are thus carried by the inner wall of the frame side guide rail and extend over the frame opening to engage the inner face of the upper panel 29 adjacent the top and bottom thereof to hold the upper panel against horizontal inward displacement while resiliently retaining the panel against vertical movement in response to gravity. It will be apparent that the lower sash clip 38 shown in Figs. 1 and 2 will not only engage the upper sash for the purpose described but will also engage the upper end of the lower panel 30 to prevent inward horizontal movement of that end thereof. To maintain the lower end of the panel 30 against the outer retaining strip of the sill and side guide rails, rotatable locking elements or fasteners 38*a* are pivotally mounted on the inner wall of the sill guide 22 so that in the full line positions shown in Fig. 1, these fasteners will extend over the inner face of the lower end of the panel 30 and lock the lower end of this panel against inward horizontal movement. If desired, a single panel having a length corresponding to the combined length of the panels 29 and 30 may be mounted in the frame by removing the flexible clips 38, 38 and utilizing rotatable fasteners, such as the fasteners 38*a*, in their place.

It will be apparent from the various views of the drawings that the engaged portions of the adapter and guide rails of the adjustable frame will be disposed between the panels 29, 30 and the conventional building aperture frame 10 in such manner as to be effective to form a weather-tight and wind-arresting seal in conjunction therewith. To provide such a seal between the upper and lower panels 29 and 30, the bottom of the glass-holding frame of the panel 29 is formed to provide a channel (Fig. 4) the downwardly projecting sides 40 and 40*a* thereof overlapping opposite sides of the upper part of the screen panel 30, this connection also maintaining the panels in interlocking engagement with each other and assisting in maintaining the lower sash in position.

Referring to Fig. 2, each of the inner side portions of the frame 10 is provided with a ventilating bracket generally designated at 41 having angularly disposed portions 42 and 43, the portion 42 being secured to the adjacent side section of the building aperture frame by screws 44 and the other portion angularly disposed with respect to the portion 42 projecting toward the bottom of the adjustable frame and being reversely bent to form a U-shaped retaining clip 45 having a channel 46 therein for receiving the lower end of the panel 30 to maintain the same in a ventilating position. While a screen has been shown to illustrate this feature of the invention, the brackets are adapted for a glass panel, such as the panel 29 inasmuch as the frame is adapted to hold two glass panels 29 or two screen panels 30 depending upon the season and weather or climatic conditions. The brackets thus hold the bottom panel open for ventilation and the upper end of the panel is held against the downwardly projecting bottom portion of the panel 29 by the lower clips 38, 38.

The panels 29 and 30 may be readily inserted within the adjustable frame by disposing the upper panel 29 beneath the lower clips 38 with its outer side edges against the flange portions 25, 25 of the side guide rails and thereafter pushing the panel upwardly into the position shown in Fig. 1, the bottom panel 30 being inserted by disposing the top thereof within the channels in the bottom of the panel 29 and thereafter moving the lower portion of the panel into the frame opening for engagement with the outer retaining portions thereof, the locks 38*a*, 38*a* thereafter being rotated to fasten the panel 30 in position.

It will be apparent from the foregoing description that the adjustable sash frame is of

simple construction inasmuch as it comprises perfectly straight vertical rails or side adapters and guides and also horizontal rails constituting the top and bottom guides and adapters that may be readily formed by an extruding or rolling operation and inasmuch as all of the adapter rails have uniform angularly disposed portions they may be formed in a continuous strip which may be severed to correspond to approximately the length or width of any building frame opening. This is equally true of the top and side guide rails, and also the bottom channel-shaped sill adapter. Inasmuch as these respective members of the adjustable frame may be formed as continuous strips of relatively simple structure, the adjustable frame is relatively inexpensive to manufacture.

Another advantage of the invention is that due to its flexibility and adjustability to various sizes of building aperture frames, it can be readily adapted to fit different dimensions of these frames, as well as such frames which are slightly deformed or out of square. This feature of adjustability of the frame of the present invention is considerably enhanced inasmuch as each of the guide rails at the top, bottom and sides of the panels adjacent thereto are independently movable relative to each other so that the frame may be adjusted readily to compensate for alterations occurring in the wood building aperture frame 10 due to weather conditions causing warping or other changes in the wooden frame after the frame has been installed and thereafter, in the event further alteration of the wooden frame occurs necessitating another adjustment of the frame guide rails and adapters relative to each other.

In view of the fact that the component parts of the adjustable frame i. e., the adapters and guides are formed perfectly straight, a large quantity may easily be packed, shipped and stored in an economical manner inasmuch as the space required for such purposes is small in comparison to the amount of the rails and guides required for any particular house or building. A further saving is effected by cutting the straight rails, forming the guides and adapters, to different lengths for assembly with building aperture frames of different standard window openings so that, if desired, the rails may be cut to lengths ordered by building contractors or ordered to fit the needs of the individual home owner to meet their respective requirements.

A further important advantage of the present invention, is that the unassembled component parts of the adjustable frame of the invention may be easily transported to the job and may be quickly assembled at the job by a person with relatively little experience and without the use of special tools or equipment.

It will be apparent that the economy secured by the relatively small space required for shipping and storing the component parts of the frame in disassembled condition and the simplicity of installation and adjustment is greatly desirable besides effecting substantial savings for the home owners or building operators, which factors are of considerable appeal to the buying public in ordinary retail stores, mail order houses, as well as to the business houses having for their occupation the installation of combination screen and storm sash units.

It will be apparent from an inspection of the drawings and particularly Figs. 1 and 2 that, when the improved storm and screen sash of the present invention is assembled with the conventional building aperture frame, the outer and inner sides of the adjustable frame are flush with the seasonably interchangeable panels mounted therein to afford a neat and attractive appearance from the inside and outside of the building.

It will now be clear that there is now provided a combination storm and screen sash of the type described which accomplishes the objects of this invention. While the invention has been described in its preferred form and while certain terms and specific language have been used, it is to be understood that the embodiment of the invention as described and shown, is merely illustrative of the broad idea and is not to be considered in a limiting sense. It is further obvious that various changes may be made by those skilled in the art without departing from the spirit of the invention as disclosed and defined in the appended claims.

I claim:

1. In a sash structure for mounting in a window aperture of a building aperture, a metallic panel-receiving frame comprising top and bottom bars received between side bars, each of said bars being channel members having inner and outer webs and a connecting web adapted to seat against an adjacent edge of a panel, said connecting web having a flange extending into the panel-receiving opening for engagement with a side of a panel; top, bottom and side sealing members mounting said bars, each of said top and side sealing members being of L-section and said bottom sealing member being of U-section, each sealing member having one of its flanges seated against the outer web of the bar mounted thereon, each of said frame bars being movable relative to each other bodily sidewise and at an angle in the plane of said frame whereby said bars may be adjusted to position the connecting webs thereof in engagement with the edges of a panel, said top and bottom bars being the same length as the panel width and having their opposite ends abutting the connecting webs of said side bars and acting as templates to maintain said side bars in spaced relation corresponding substantially to the panel width, said flanges of said side bars at the ends of said bars overlapping the ends of said top and bottom sealing members and bars, and means for securing each of said bars to its mounting sealing member in fixed relation thereto.

2. In a sash structure mounting in a conventional window frame of a building, a metallic frame mounted in said window frame and comprising top and bottom bars and side bars defining a panel-receiving opening, each of said bars being of channel shape with the web connecting the inner and outer webs thereof being adapted to seat against the adjacent edges of a panel and having a flange extending from said connecting web inwardly of said panel-receiving opening for engagement with the side of a panel to be disposed in said opening, top and bottom and side sealing members slidably mounting said frame bars and for sealing the spaces between edges of the panel-receiving frame and the walls of a building aperture, each of said bars being bodily movable sidewise relative to each other and the sealing member mounting the same to engage the connecting webs thereof with the adjacent edge of a panel within said opening, said top and bottom bars being the same length as the panel width and having their opposite ends abutting said connecting webs of said side

bars to insure engagement of said side bars with the adjacent edges of a panel and the inwardly extending flanges of said side bars overlapping said ends of said top and bottom bars, means connecting the outer web of each bar to the sealing member mounting the same for maintaining the bar and sealing member in assembled relationship during relative movement thereof and for securing the same in fixed position, means for securing said top and side sealing members to the walls of a building aperture, and means for holding said bottom bar and sealing member in assembly with the assembled side bars and attached sealing members in a manner permitting said bottom bar and its attached sealing member to be removed as a unit from said sash structure while said side bars and their attached sealing members are maintained in assembled relation.

3. A combination storm window and screen structure mounted in a conventional window frame of a building comprising upper and lower sash within said window frame; a metallic frame including side and transverse bars of H shape in cross-section with the channel of each bar opening toward the window frame and the flange extending from the channel toward the sash, side and transverse sealing members slidably mounting said bars and extending substantially the full length of the bar mounted thereon, each of said members having angularly arranged portions one of which portions seats against its associated bar and slidably engaging one of the spaced facing walls thereof defining the channel therein for tilting and bodily sidewise movement of the sealing members to engage the other angularly arranged portions thereof with the top, bottom and sides of said window frame, each of said bars being movable relative to each other and to each of said sealing members for engaging the webs, connecting the parallel webs of the bar, with the adjacent edges of the upper and lower sash, and the flanges of the bars with the sides of the sash, each of said transverse bars being of a length corresponding to the width of the sash and extending between said side bars and engaging their opposite ends therewith upon movement of the side bars toward said transverse bars to space the side bars so as to engage the side edges of the upper and lower sash; and means for retaining said bars and members in assembled relation during movement of said bars relative to said members and for securing the bars and members in fixed position to hold the same in adjusted position.

4. Storm window and screen structure for mounting in a conventional window frame and located entirely outwardly of the blind stop of said frame, said structure comprising an upper and lower sash; a metallic panel supporting frame having spaced side members and spaced top and bottom members, each of said members being of H-shaped cross-section throughout its length and providing inner and outer webs extending from the connecting web and toward the window frame and a flange extending from the connecting web, said flanges engaging the outer side of a panel and said connecting webs engaging the edges of the panel; spaced top and bottom and spaced side sealing elements engaging said members each of said top and side elements being of L-shaped cross-section and positioned to have its inside angle facing inwardly of the window frame, with one web thereof engaging the exterior surface of the outer web of the correspondingly located member and the other web of each member seated against and fixed to the window frame, said bottom member being of U-shaped cross-section with the parallel webs thereof extending between and engaging the inner and outer webs of the bottom member while the connecting web of the bottom member engages the window frame, each of the engaged side members and elements extending between and having their ends engaging the top and bottom of the window frame, and each of said top and bottom members and elements extending between and having a length corresponding exactly to one of the length and width dimensions of a panel mounted in said frame and having their opposite ends at right angles to the element or member and engaging the connecting webs of said side elements in planes inwardly of said members to maintain the side members in such spaced relation so as to engage the edges of the panel, the flanges of said side bars at the ends thereof overlapping the ends of the top and bottom members to conceal the ends of the top and bottom members and to provide a seal preventing the entrance of rain between the elements and members, and means securing said bars and members in assembled relationship.

5. A combination storm window and screen structure as set forth in claim 3 wherein said means for retaining said bars and members in assembled relation during movement of said bars relative to said members and for securing the bars and members in fixed position to hold the same in adjusted position comprises spring members of U-shape receiving between their parallel webs one of the flanges and a bolt extending through aligned openings in the parallel webs in the spring members and the flange, and an elongated transverse slot in the one flange, said parallel webs of the spring members having their sides defining the openings therein grippingly engaging the threads of the bolts.

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