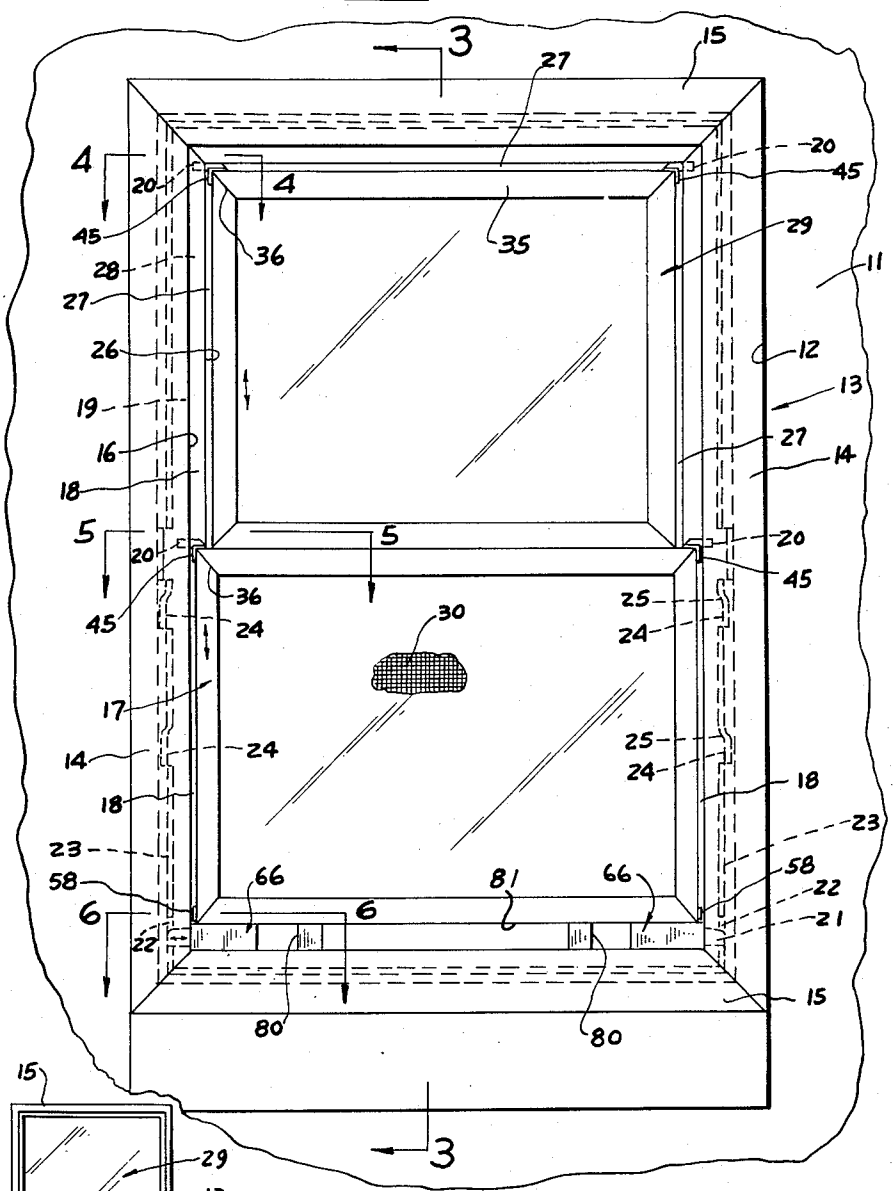
Dec. 27, 1960 A. J. OLSEN 2,965,935

COMBINATION WINDOW

Filed Aug. 11, 1958 4 Sheets-Sheet 1

Fig. 1



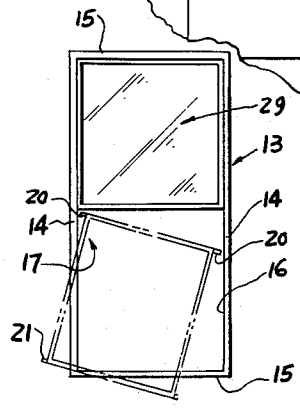


Fig. 2

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COMBINATION WINDOW

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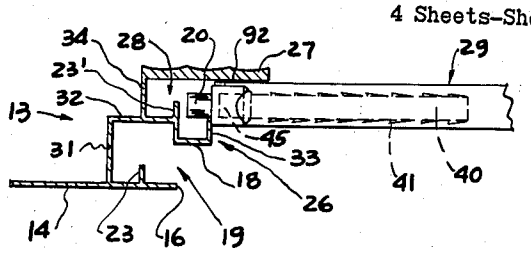

Fig. 4

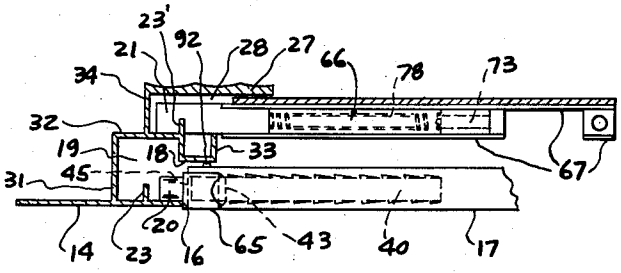

Fig. 5

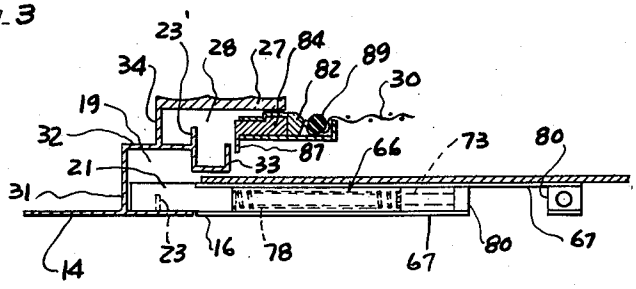

Fig. 6

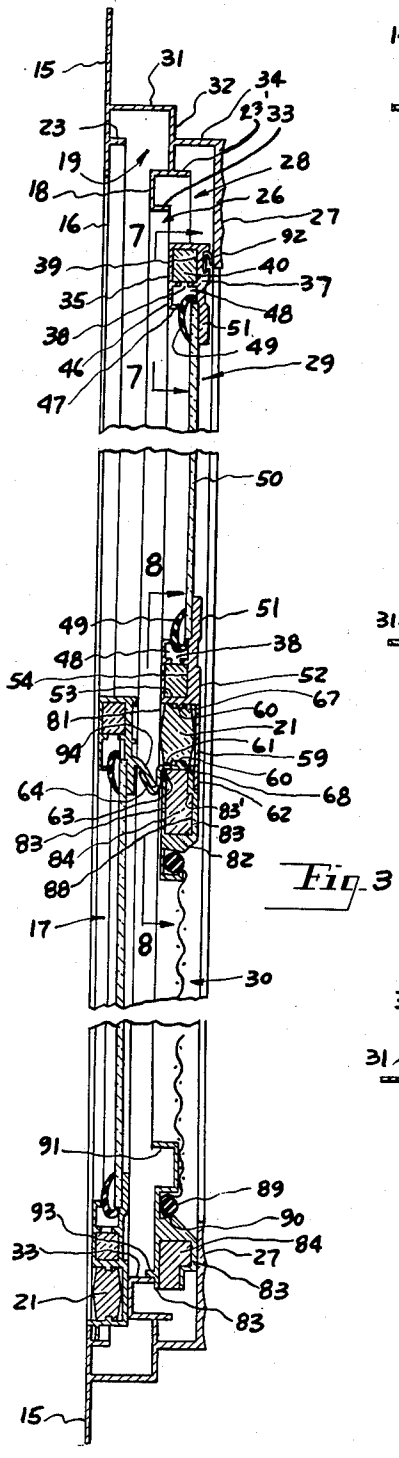

Fig. 3

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COMBINATION WINDOW

Filed Aug. 11, 1958 4 Sheets-Sheet 3

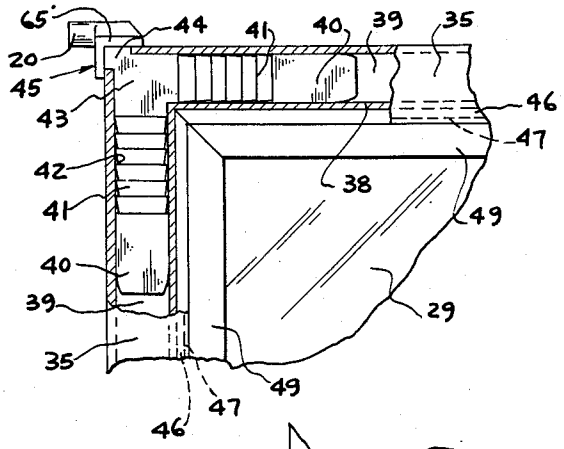

Fig. 7

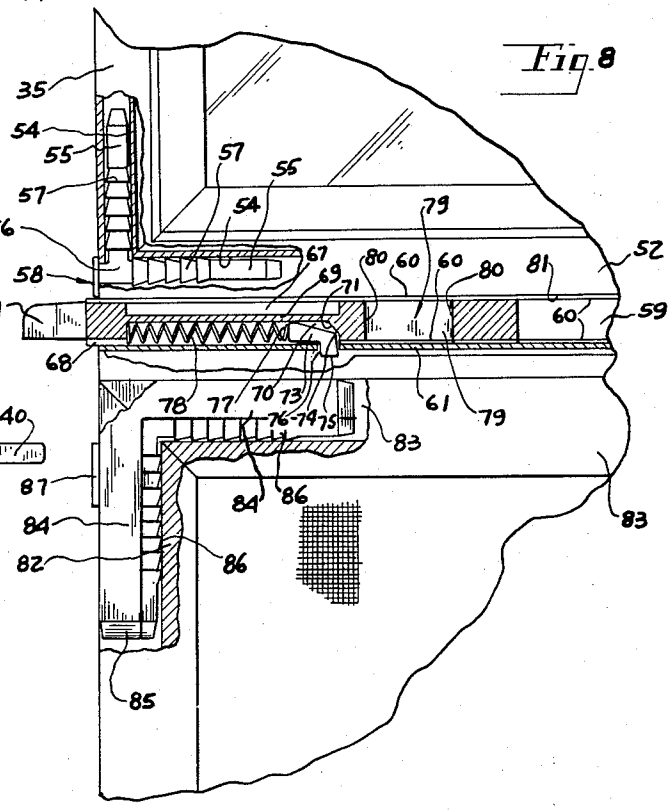

Fig. 8

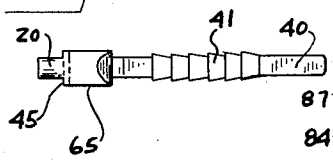

Fig. 9

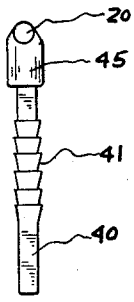

Fig. 10

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COMBINATION WINDOW

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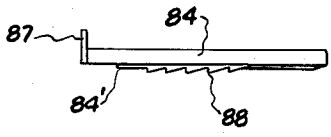

Fig. 12

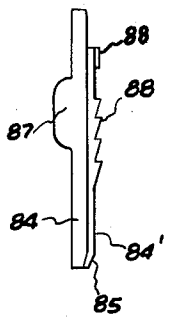

Fig. 13

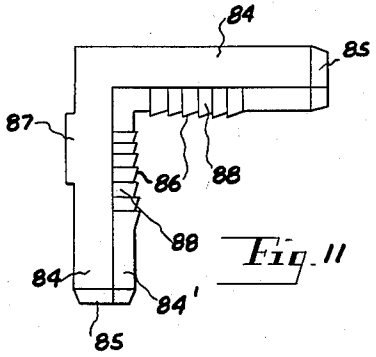

Fig. 11

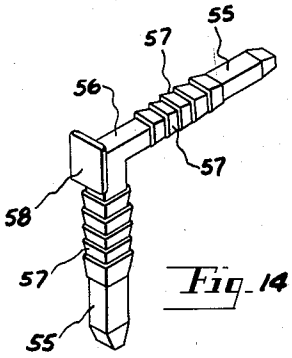

Fig. 14

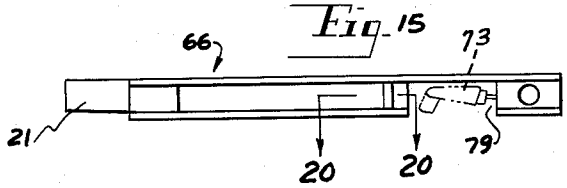

Fig. 15

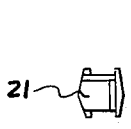

Fig. 17

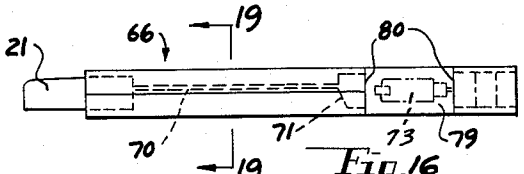

Fig. 16

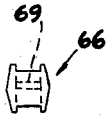

Fig. 18

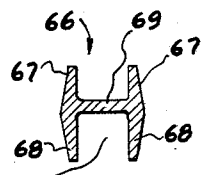

Fig. 19

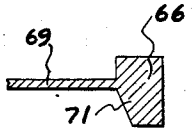

Fig. 20

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United States Patent Office 2,965,935 Patented Dec. 27, 1960

2,965,935

COMBINATION WINDOW

Allen J. Olsen, Detroit, Mich., assignor to Rogers Industries, Inc., a corporation of Michigan

Filed Aug. 11, 1958, Ser. No. 754,470

5 Claims. (Cl. 20—52.2)

This invention relates to combination windows and more particularly to combination window assemblies and screens.

It is the object of the present invention to provide a novel form of window frame having a pair of tracks, one track adapted to slidably receive an upper window assembly and a lower framed screen. The other track adapted to slidably receive a vertical adjustable lower window assembly.

It is the object of the present invention to provide novel means for slidably and pivotally mounting the window assemblies within the window frame tracks for the purpose of minimizing friction and eliminating noise.

It is a further object to provide novel mounting for window assemblies whereby they may be slidably provisioned within the window frame and pivotally thereon and disengaged therefrom.

It is a further object to provide a novel window assembly including a series of interlocked channels together with a novel corner angle for fixedly securing the channels together defining the window or screen frame as a rigid unit.

It is a further object to provide a nylon cornerlock for the window and screen frames which include as a part thereof laterally and outwardly projecting pads which serve as cushions and which are adapted to slidably bear against portions of the window frame for minimizing friction and providing a quiet operation.

It is a further object to provide self locking frame corner angles.

It is another object to incorporate in the window frame corner angles laterally extending pivot means for retainingly engaging the upper ends of the window elements within the window frame tracks.

It is a further object to provide a novel latch mountable within the lower ends of the window assemblies on opposite sides to retain the lower ends of the window elements within their respective guide channels or tracks and which also lock said window assemblies closed or secure same in vertically adjusted positions.

It is another object herein to provide a novel form of window latch which is self securing within portions of the window assemblies but which may be easily disengaged and removed for repair or replacement.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawings in which:

Fig. 1 is a front elevational view of an assembled window frame with windows and screen as mounted within a building wall.

Fig. 2 is an interior elevational view of said assembled window frame on reduced scale illustrating the removability of the windows.

Fig. 3 is a section on an enlarged scale taken on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary section taken on line 4—4 of Fig. 1.

Fig. 5 is a fragmentary section taken on line 5—5 of Fig. 1.

Fig. 6 is a fragmentary section taken on line 6—6 of Fig. 1.

Fig. 7 is a fragmentary section on an enlarged scale taken on line 7—7 of Fig. 3.

Fig. 8 is a fragmentary section on an enlarged scale taken on line 8—8 of Fig. 3.

Fig. 9 is a plan view of the corner angle shown in Fig. 7.

Fig. 10 is an end elevational view thereof.

Fig. 11 is a side elevational view of the screen frame corner lock of Fig. 8, on an enlarged scale.

Fig. 12 is a plan view thereof.

Fig. 13 is an end elevational view thereof.

Fig. 14 is a perspective view of one form of corner angle for the window frame assembly shown in Fig. 8.

Fig. 15 is a plan view of the window latch shown in Fig. 8.

Fig. 16 is a side elevational view thereof.

Fig. 17 is a left end elevational view of Fig. 16.

Fig. 18 is a right end elevational view thereof.

Fig. 19 is a section on an enlarged scale taken on line 19—19 of Fig. 16.

Fig. 20 is a fragmentary section on an enlarged scale taken on line 20—20 of Fig. 15.

It will be understood that the above drawings illustrate merely a preferred embodiment of the invention and that other embodiments are contemplated within the scope of the claims hereafter set forth.

Referring to the drawings, Fig. 1 indicates fragmentarily at **11** a portion of a building wall having a rectangular opening **12** within which is nested and secured a window frame **13**. Said frame has an irregular cross sectional shape as shown in Fig. 4 and is so constructed as by extruding, for example, to provide a pair of parallel spaced guideways or tracks for receiving respectively the vertically adjustable window assemblies **17** and **29**.

Frame **13** includes the front upright flanges **14** which define a pair of end rails and which is also formed into the top and bottom rails **15** suitably chamfered at their ends and secured together on a conventional manner.

The front flange **14—15** adapted to be positioned flush with the interior wall of a building has an inner edge which defines the upright rectangular opening **16** within which is loosely projected the lower vertically adjustable tilt window **17**, Fig. 5. Said window along its rear surface bears against the upright retainer **18**, and slidably engages the same upon vertical adjustment, there being a suitable resilient seal **92** mounted on window **17** engageable with retainer **18**.

The flange **14** in conjunction with retainer **18** has upon its interior the upright channel **19** further defined by the extrusions **31—32** which form an integral part of the window frame assembly **13**.

Fig. 4 fragmentarily illustrates the location of the rearwardly arranged vertically adjustable framed window **29** which is slidably positioned within the rectangular opening defined by the continuous rearwardly extending flange **33** adjacent retainer **18**. Said window slidably engages the inwardly directed flange **27** with a suitable seal **92** carried upon the rear surface of the frame of window **29** engageable with the inner surface of continuous flange **27**.

Window frame **13** also includes the additional continuous extrusion **34** which defines with extrusion **32** and flange **27** the second upright channel **28** into which is slidably positioned the laterally extending pivots **20** projecting laterally from the upper end of window **29** on its opposite sides as further shown in Fig. 1. Said pivots are retainingly engaged by the inwardly directed flange **33** which forms a part of window frame **13**. Window assembly **29** is otherwise loosely positioned within the

opening defined by flange 33. Similar pivots 20 projecting laterally from opposite sides of the top of window 17 are retainingly engaged by flange 14 adjacent opening 16.

A pair of laterally directed spring biased latches 21 project from the lower ends of both of the window assemblies 17 and 29 with the latches on window assembly 29 nested within channel 28 and with the corresponding latches for window 17 nested within channel 19, Fig. 6. Accordingly in both cases the vertically adjustable windows are loosely positioned within the respective window openings and are retained at their upper ends by the pivots 20 and at their lower ends by the retractable latches 21.

As shown in Figs. 1 and 6, within the upright channels 19 and projecting rearwardly of flanges 14 is the upright latch plate 23 which is continuous throughout the window frame and has formed therethrough a pair of opposed transverse notches 22, adapted to cooperatively and retainingly receive latches 21 for securing window 17 in its lowermost position.

Said latches 21 restrain lower window 17 against upward movement within its track. However, window 17 may be elevated by manual application to the said latches as at points 80 by which the sliding latches are withdrawn from the respective slots 22. Upon upward movement of window 17, the respective latches 21 will ride along the interior surfaces of latch plates 23 and will be resiliently projected within the next adjacent opposed recesses 24 in said latch plates upon registry therewith to thereby support window 17 in an intermediate position against downward movement.

Slots 24 terminate in the curved cam surfaces 25 whereby an upward thrust upon window 17 will automatically retract the respective latches against their spring biased supports.

Further elevation of the window 17 may be accomplished until latches 21 resiliently project within the opposed top pair of notches 24 formed in latch plates 23. In order to drop the window down, it is necessary to again manually retract the latches inwardly against the action of their springs. It is further necessary to hold these latches inwardly until passing of the lower of the slots 24. Further downward movement of window 17 will result in a snap closing and locking of the window with the latches 21 automatically projecting into latch openings 22 at the bottom of the window frame.

A similar construction is also provided for similar latches 21 arranged at the lower ends of the upper window 29 and with respect to the second track or channel 28, as best illustrated in Fig. 5.

Here corresponding latches 21 normally bear against upright latch plates 23' which project rearwardly from extrusions 32. These plates also have a series of horizontally opposed pairs of notches adapted to retainingly receive latches 21 by which the upper window 29 is secured in its upper closed position or may be in an intermediate lowered position.

A similar camming structure is provided as shown at 24 and 25, Fig. 1, by which window 29 may be elevated from any intermediate secured position without manual withdrawing of the respective latches.

Arranged below window 29 in a conventional manner and with respect to channel 28 is a screen 30 with a suitable frame 82 at its upper end interlocked with window 29 as shown in Fig. 3, with the lower end of said screen interlocked with the bottom sill 33.

The above described adjustable window assembly 29 includes the extruded preferably aluminum frame elements 35 which are mitered at 36 and include, as shown in Fig. 3, back flange 37 and the inwardly directed spaced extrusions 38 which define channel 39 adapted to snugly and cooperatively receive the respective legs 40 of the corner angles 43, shown on an enlarged scale in Fig. 7.

The respective frame elements 35—37 are in the form of extruded aluminum strips of the cross sectional shape shown in Fig. 3. These are assembled as shown and the respective corner angles 43 constructed of nylon are employed for fixedly securing the window frame elements together as a unit. The respective grooves 39 are of such size as to snugly and frictionally receive corner angles 40—43.

Legs 40 throughout portions of their length have a series of transverse inwardly directed serrations 41 which extend rearwardly or upwardly therearound and are adapted to grippingly engage frame elements 35—37 and are thereby restrained against dislodgement.

The interlock is particularly illustrated at 42 in Fig. 7. The central body 43 of the corner angle terminates in the outer projection 44 which extends through corresponding notches formed in the outer surface of channel members 35—37 and terminates in the upright pressure pad 45. This pressure pad extends laterally of the respective opposite sides of the window assembly and is adapted for loose contact with the inner surface of flange 33, Fig. 4, which defines corresponding window opening 26. The positioning of said pressure pads 45 on opposite sides of window 29 is shown in Fig. 1.

Being constructed of nylon, preferably, or of some other plastic, or low friction material, there is provided a sliding contact or pillow as at 45 between the upper ends of the window 29 and the adjacent frame portions by which vertical adjustments of the window are defined. A similar assembly is also provided at 20—45 within the opposing upper ends of lower window 17 and wherein the respective pillows 45 terminate in the laterally extending pivots 20. Shown in Fig. 5, these pivots are retainingly projected within channel 19 and against the inner surface of the respective continuous flange 14—16, inwardly of latch plates 23.

This construction permits a pivotal mounting loosely of the upper ends of windows 17 and 29 within their respective guide channels upon release of their respective lower latches 21. Said windows may be completely removed from the window flange, as illustrated in Fig. 2.

As shown in Figs. 3 and 7, the cooperating slotted channel frames for windows 17 and 29 include inner flange 46 which terminates in the inwardly directed continuous boss 47 to define with the flange 37 the continuous chamber 38 adapted to retainingly receive one margin of flexible sealing bead 49.

The opposite margin of said bead cooperatively engages peripheral portions of glass 50 which is nested within lateral offset 51 of the window frame and suitably secured thereto as by cementing.

The bottom frame for said windows includes extension 52 and web 53 defining with opposed flanges 38 the elongated grooves 54 similar to grooves 39 adapted to snugly and cooperatively receive end portions 55, Fig. 8, of corner angles 56 similar to top corner angles 43 of Fig. 7.

The respective channel frames have cooperating mitered corners as indicated at 36 in Fig. 1, and the corner angles 43 and 56 are adapted for fixedly securing the respective frame elements 35 in assembled relation.

Corner angle 56 has formed around intermediate end portions a series of rearwardly and outwardly inclined serrations 57 adapted to frictionally and retainingly engage within the corresponding right angularly related grooves 54.

Here also corner angles 56 at the lower ends of the windows extend through slotted end portions of adjacent frame elements and terminate in the upright pressure pads 58 similar to pressure pads 45 adapted for loose sliding engagement with the corresponding window guide flanges 33 and 16, as shown in Figs. 4 and 5.

Pads 58 are integral with the corner angles and are constructed of a non-metallic material such as nylon for minimizing friction and noise and to facilitate sliding movement of the respective windows. The above described pressure pads 45 and 58 are arranged upon the

exterior of opposite sides of said windows adjacent their tops and bottoms.

The respective bottom channel frames for said windows include the elongated flanges **59** which define with webs **53** and **61** the elongated outwardly opening slots **81** which extend across the width of the respective bottom channel frame.

A pair of vertically aligned inwardly directed flanges **60** extend from webs **53** and **61** serving as retaining guides for the manually retractable latch assemblies **66** arranged within and adjacent the outer ends of slot **81**.

The bottom plates **59** terminate in the elongated downwardly depending flanges **62** which cooperate with the forwardly spaced vertical extensions **63** at the inner end of web **61** to define therewith an elongated recess adapted to retainingly receive the upper edge of the screen frame **83**. Said screen frame is nested in the outer channel of window frame **13** and bears against retainers **27**.

Flange **63** terminates in the upwardly curved and inwardly directed interlock **64** adapted to project under a corresponding downwardly extending laterally elongated interlock **94** projecting outwardly from the top channel frame of lower window **17** providing a seal therebetween. The lower channel screen frame is retained within bottom guide flange **33**, Fig. 3, and includes support boss **93** which rests upon said flange. With screen **30** removed, window **29** may be vertically adjusted.

Referring to Fig. 7, the upper pressure pads **45** terminate in the inwardly directed flanges **65** which overlie the upper corners of the windows, said flanges **65** merging into the above described nylon pivots **20**.

Latch assembly

The above described latch is shown in detail in Figs. 15 through 20 and is generally indicated at **66** as a unitary molded device formed of a non-metallic substance, such as nylon, due to the strength, low friction, and wear characteristics thereof.

The latch includes the pair of spaced upwardly directed flanges **67** and the parallel spaced downwardly directed flanges **68**, there being an intermediate longitudinally disposed connecting web **69** defining therebelow an elongated slot **70** adapted to receive coiled spring **78**, Fig. 8.

The respective inner flanges **67** and **68** as shown in Figs. 3 and 8 interlockingly engage the opposed aligned flanges **60** upon the interior of the outwardly opening slot **81** which slidably receives latch assemblies **66** and limiting said assemblies to transverse sliding movements.

Latch assembly **66** has the outwardly projecting latch **21** at its outer end cooperatively engageable with the interior surfaces of guide flanges **33** and **16**, Figs. 5 and 6. Said latches **21** are adapted to slidably engage latch plates **23** and **23'** and to be loosely projected within the respective transverse slots **22** and **24** above described in connection with Fig. 1.

Said latch assemblies therefore perform the function of serving as projection means at the lower ends of the respective windows retainingly engaged within the inner and outer channels of the main window frame and bearing against the interior surfaces of the respective guide flanges **16** and **33**.

The latch element **21** serves the further function of fixedly, yet adjustably securing the respective windows in closed position or in intermediate positions within their respective channels.

Each latch assembly **66** has one end wall engaged by spring **78**, Fig. 8. The other end wall defining said slot is tapered at **71** to cooperatively engage cam surface **74** of dog **73** positioned within slot **70**.

The inner end of said dog has a circular boss **77** adapted to retainingly engage within one end of spring **78**. The opposite end of said dog has a lateral boss **75** which extends outwardly and movably through opening **76** formed in web **61** defining the bottom wall of slot **81**.

Upon assembly, web **61** cooperates with the latch assembly for effectively retaining securing spring **78** within slot **70** and likewise supports dog **73** therein.

As shown in Figs. 15–16, latch assembly **66** has towards its rear end the outwardly opening slot **79** defined by the spaced end walls **80** which provide a finger piece or means to permit manual withdrawal of the latch assembly for disengaging latch **21** from a particular latch plate opening, such as opening **22** in Fig. 1. This permits vertical adjustment of the window. Access to slot **79**, as shown in Fig. 8, is through the outwardly opening slot **81** in the bottom channel frame for the window.

Boss **75** on dog **73** serves to anchor spring **78** within latch assembly **66** and furthermore said boss restrains said latch assembly against outward withdrawal from the end of slot **81**. Should it be desired to replace the latch assembly, this may be done by simply projecting boss **75** inwardly so as to clear opening **76** against the action of spring **78**. The entire assembly may then be laterally withdrawn from the end of slot **81** for repair or replacement. Upon re-assembly, the action of spring **78** and the cam action of inclined surface **71** with respect to cam surface **74**, causes boss **75** to resiliently project through opening **76** as the latch assembly is re-assembled within slot **81**. This is a great improvement over prior constructions because the removal of the latch assembly may be accomplished without in any manner disassembling the window frame.

Referring to Figs. 3 and 8, the screen assembly includes the cooperating mitered end channel frame elements **82** with spaced outwardly directed flanges **83** there-around defining a continuous outwardly opening slot **88**.

Corner angles **84** of non-metallic material such as nylon are snugly and tightly projected within the outwardly opening slots of said screen channel frame for fixedly securing the frame elements together. The interior wall of flange **83** towards its outer edge is laterally offset as at **83'** to retainingly receive the lateral offset **84'**, Figs. 11, 12 and 13.

The outer ends of the corner angles are tapered at **85** to facilitate insertion within the slots defined in the frame channels **83**. A series of outwardly and rearwardly directed serrations **86** extend transversely across the bottom or inner walls of angle members **84**. An additional set of right angularly related serrations **88** extend transversely across the outer walls of lateral extension **84'**. These serrations operatively and retainingly engage interior surface portions of the screen channel frames **83** whereby the screen frame assembly is fixedly secured together.

The corner angles **84** extend to outer margins of the intersecting channels **83**. There is provided at the outer edge on one side of said corner angle the right angularly related pressure pad **87**. This pad of nylon material projects laterally from opposite sides of the framed screen at its top and bottom and is adapted for loose sliding contact with the interior surface of guide flange **33** of the outer channel **28** in the window frame **13**.

The screen **30** at its margins is projected within the outwardly opening continuous groove **90** formed upon the exterior of the assembled screen frame **83** and is secured therein by the continuous wire bead **89** in a conventional manner.

The bottom channel frame for said screen, as shown in Fig. 3, includes the transverse outwardly extending flange **91** to facilitate raising of the screen from the position shown in Fig. 3 and removal thereof. Upon assembly within window frame **13**, of outer window **29** with respect to channel **28**, the screen is then inserted with its upper edge retainingly projected between the depending flanges **62—63** which form a part of the lower channel frame of window **29**.

The lower edge of the bottom flange of the screen frame is projected behind guide flange **33** which functions like a sill and retains the screen against outward

movement once assembled. Inwardly extending boss **93** cooperates with the top surface of flange **33** for supporting said screen in the position shown.

Thereafter the outer window **17** is assembled with respect to window frame **13** by first canting the window as shown in Figs. 2 and 5 so that the pivots **20** at its upper end interlock within channel **19** behind guide flanges **16**.

As a final step, the two latches **21** at opposite lower ends of window **17** are manually retracted simultaneously and the window frame is projected at its lower end into channel **19**. The latches **21** when released assume the window retaining position shown in Fig. 6, completing the combination window assembly of Fig. 1.

The corner angles **43**, **56** and **84** and associated pivots and pressure pads may be constructed of a suitable low friction metal or other material. The dotted line indication of dog **73** in Figs. 15 and 16 is not a position of use. It is molded that way and broken off.

Having described my invention, reference should now be had to the following claims.

I claim:

1. In a window structure, a sash including a channel frame having an outwardly opening groove extending throughout the width of said sash, spring biased manually retractable non-metallic latches slidably and retainingly positioned within opposite ends of said groove, each latch having an elongated slot therein, a dog within and retainingly engaging the latch at one end of said slot and including a boss movably projected outwardly of said slot through an opening in said channel frame, and a coiled spring under compression in said slot interposed between said dog and latch at the other end of the slot, said dog serving to anchor said spring, the spring resisting manual inward withdrawal of said latch, said dog securing said latch against longitudinal outward movement from its normal latching position.

2. The window structure of claim 1, said boss being manually projectable inwardly against the action of the spring for disengagement from the opening in said channel frame, permitting longitudinal outward removal of said latch from said channel groove.

3. A hollow rectangular frame defining an upright channel, a sash mounted therein, said sash including a channel frame having an outwardly opening groove extending throughout the width of said sash, spring biased manually retractable non-metallic latches slidably and retainingly positioned within opposite ends of said groove, an upright transversely apertured latch plate within said channel and cooperable with said latches, each latch having an elongated slot in its undersurface, a dog within and retainingly engaging the latch at one end of said slot, and including a boss movably projected outwardly of said slot and through an opening in said channel frame, and a coiled spring under compression in said slot interposed between said dog and the latch at the other end of the slot, said dog serving to anchor said spring, the spring resisting manual inward withdrawal of said latch, a wall portion of said channel frame cooperating with said slot for retaining the spring and dog therein, said dog securing said latch against longitudinal outward movement from its normal latching position.

4. The sash structure of claim 3, said boss being manually projectable inwardly against the action of said spring for disengagement from said channel frame permitting longitudinal removal of said latch from said channel groove.

5. In a window structure, a sash including a channel frame having an outwardly opening groove therein, a spring biased manually retractable non-metallic latch slidably and retainingly positioned within said groove, said latch having an elongated slot therein, a dog within and retainingly engaging the latch at one end of said slot and including a boss movably projected outwardly of said slot through an opening in said channel frame, and a coiled spring under compression in said slot interposed between said dog and latch at the other end of the slot, said dog serving to anchor said spring, the spring resisting manual inward withdrawal of said latch, said dog securing said latch against longitudinal outward movement from its normal latching position.

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