Jan. 11, 1955 J. B. DAVIS 2,699,204

SLIDING SASH TYPE WINDOW CONSTRUCTION

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Fig. 1

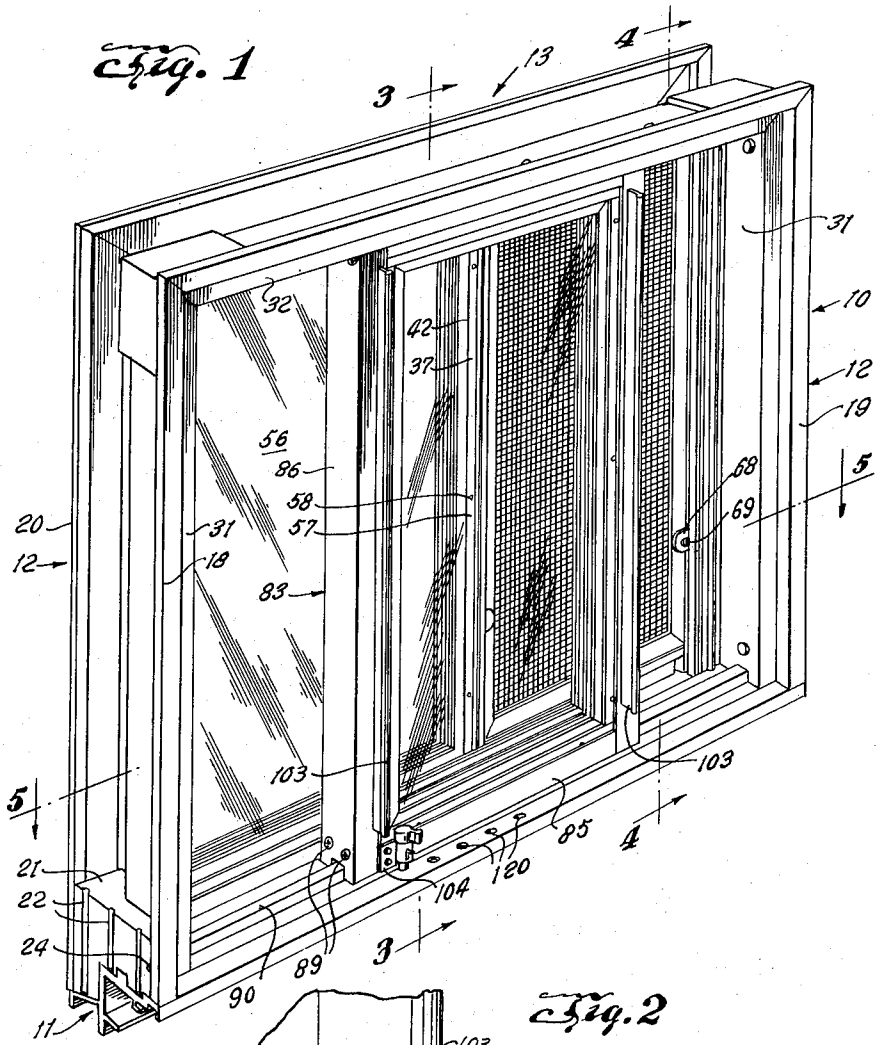
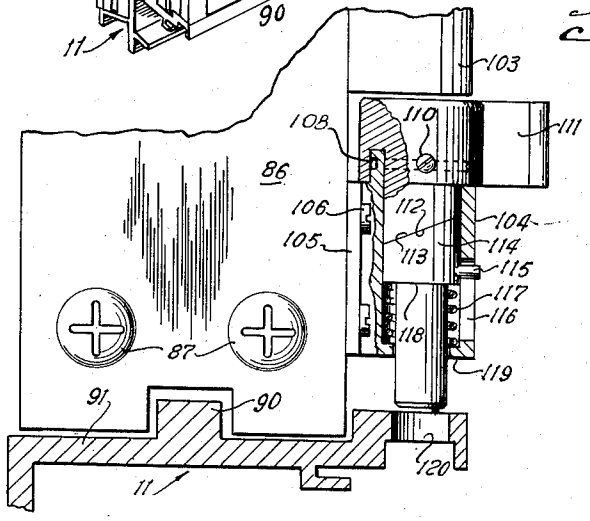


Fig. 2



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Fig. 3

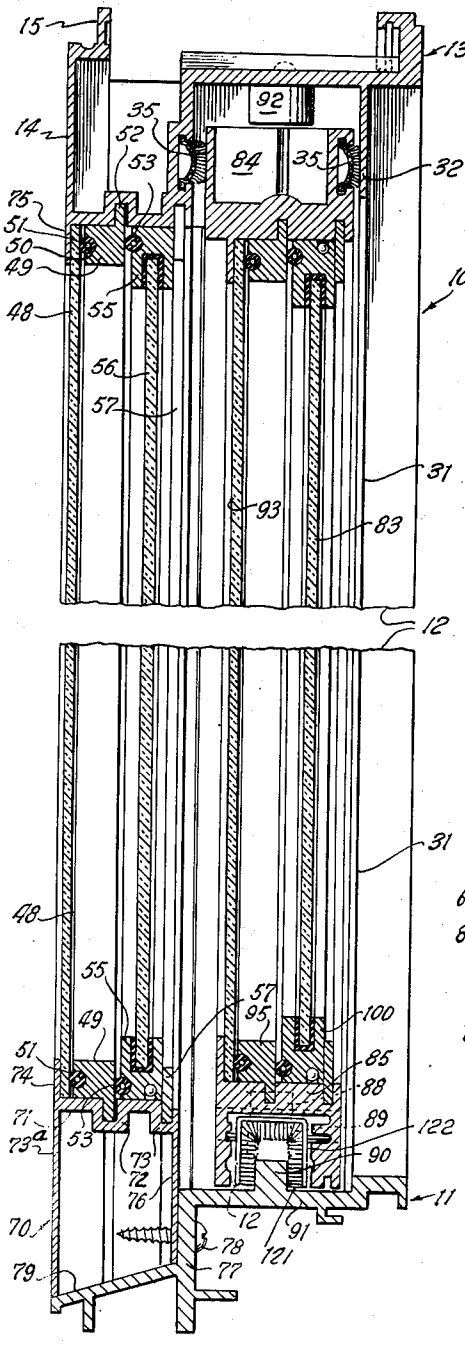
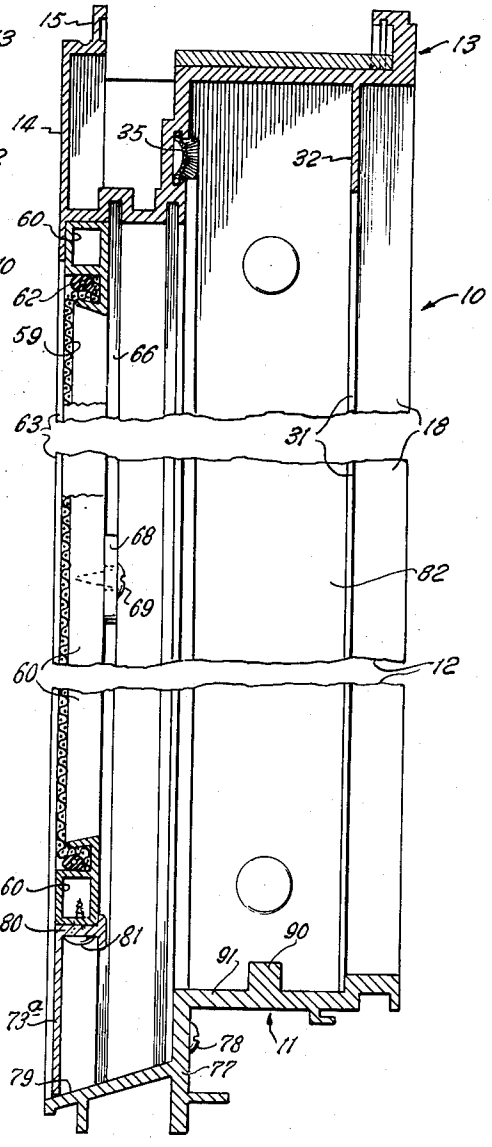


Fig. 4



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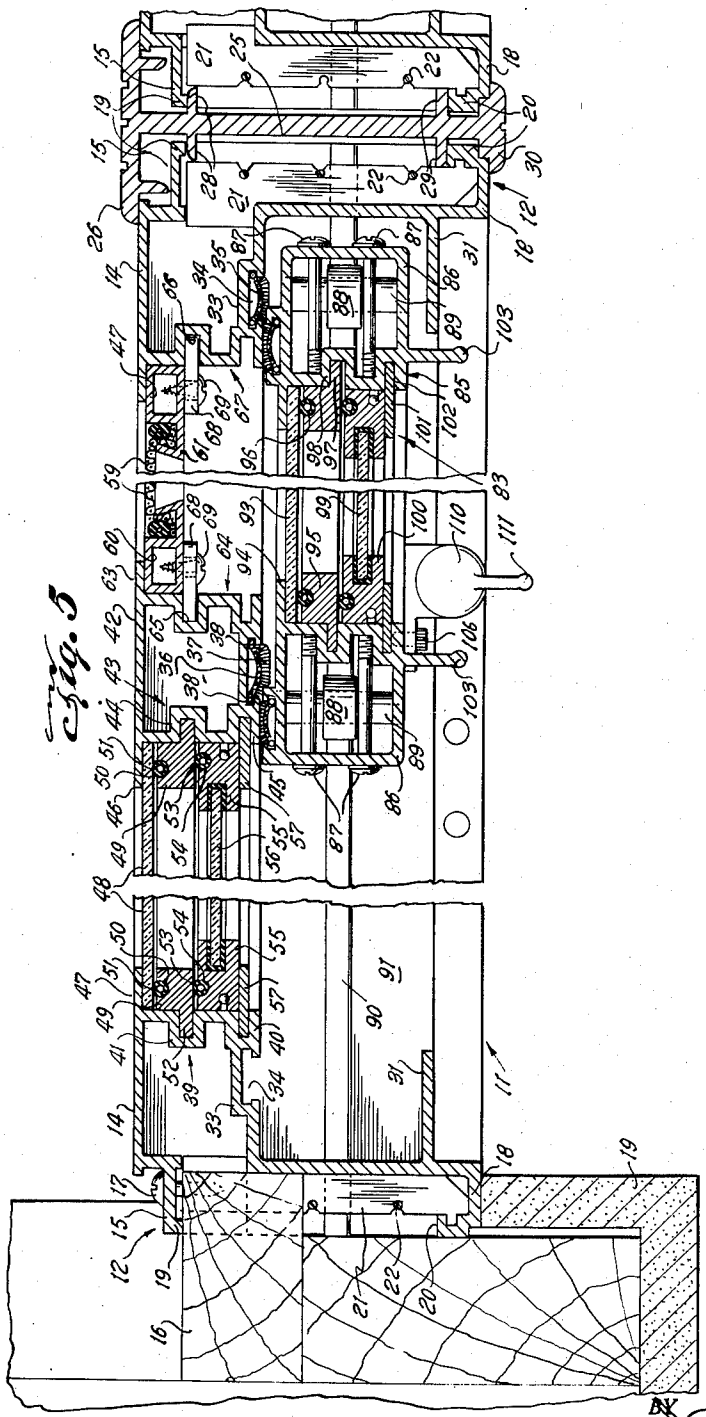


Fig. 5

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SLIDING SASH TYPE WINDOW CONSTRUCTION

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Application March 12, 1954, Serial No. 415,842

6 Claims. (Cl. 160—91)

This invention relates to metal window and sash frames and more particularly to windows of the type having laterally slidable sashes.

The principal object of the invention is to provide a window designed to meet all weather conditions, particularly in regions in which dust storms prevail, the window being equipped with double glazing, adequately sealed against moisture and especially against dust infiltration, the double glazing, combined with the hollow extruded frame construction being effective to obviate excess moisture condensation.

Another object of the invention is to provide a sliding sash type window in which is mounted a stationary double glazed sash frame and a stationary screen frame in horizontal parallelism and a sliding double glazed sash frame which is roller mounted and is removable for cleaning and other purposes by sliding the sash frame to one side of the main frame, lifting its lower end and shifting the same toward the inside to displace the frame from its channels.

Still another object of the invention is to provide a window construction wherein weatherstripping between the sliding sash frame, meeting rail and stationary frames is removable and replaceable without the necessity of detaching any part of the window.

Other objects will appear as the description proceeds when considered with the annexed drawings, wherein:

Figure 1 is a perspective view of the window as viewed from the inside of a building.

Figure 2 is a fragmentary view, partly in vertical section, showing the sash lock.

Figure 3 is a vertical sectional view taken on line 3—3 of Figure 1.

Figure 4 is a vertical sectional view taken on line 4—4 of Figure 1, and

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 1.

Continuing with a more detailed description of the drawing, reference is primarily made to Figure 1 wherein numeral **10** denotes generally the complete window which is made up of a sill **11**, parallel jambs **12** and a head member **13**. The jams and head member are identical in transverse section, each being formed by extrusion. The jambs each are formed with an outer facing **14** having an anchoring flange **15** which is secured to the building fabrication by any suitable means but is shown in Figure 5 as being secured to wood fabrication **16** by screws **17**. The opposite or inner edge of the jamb is provided with a flange **18** against which bears the interior wall finish **19**. The flanges **15** and **18** are parallel with confronting faces, the flange **15** being provided with a lip **19** while the flange **18** has a lip or inturned edge **20** and extending between these flanges within the confines of the opposed lips **19** and **20** is a sill block **21**. Each sill block **21** consists of a metal plate of a length to conform to the distance between the flanges **15** and **18** at the base of the jamb **12**, as revealed in Figure 1, and whose lower edge is shaped to the profile of the top of the sill **11**. Vertical slots **22** are formed in the outer surface of the sill block to receive screws **23** driven upwardly through the sill into the slots **22** to save the cost of drilling and tapping the blocks. Another screw is inserted into an aperture **24** in the sill block and is threaded into the jamb **12**.

Figure 5 shows a complete transverse section through the window but also shows, at the right of the figure, the manner in which two or more windows are joined together through the medium of a 180° mullion **25** which lies between the jambs **12** of each window. The mullion **25** has an exposed portion or facing **26** exteriorly of the windows whose edges bear against the outer edges of the jamb facing **14** of the adjacent jambs **12**. Vertical flanges **27** formed on the inner surface of the facing **26** provide reinforcing for the facing as well as affording a spacing means for the adjacent jambs **12**. Vertical flanges **28** on the mullion **25** adjacent the facing **26** and similar flanges **29** adajacent the inner but narrower facing **30** of the mullion bear against the inturned ends of the flanges **18** of the jambs to prohibit lateral displacement of the mullion.

Referring again to the jamb structure; a vertical flange **31** is formed on the inner surface thereof and set inwardly from the flange **18** thereof and constitutes a finish flange whose upper end is mortised to an identical flange **32** formed on the undersurface of the head member **13**, it being recalled that the cross-sectional shape of the head member and jambs is identical.

Opposite the vertical flange **31** of each jamb **12** is a vertical web **33** which is formed with a longitudinally coextensive undercut channel **34** which receives a weatherstrip **35** of conventional manufacture, the same consisting of a length of wire mesh **36** (Figure 5) to which is attached animal fibers **37** and along each edge of the wire mesh is a wire **38**, the wires being adapted to lie in the undercut edges of the weatherstrip channels **34** after the wire mesh has been collapsed and returned to its normal shape after insertion into the weatherstrip channel **34**. This construction enables a worn weatherstrip to be pulled out of its channel and replaced by a new one without disturbing any other part of the window.

The vertical web **33** of each jamb **12** is integral at its inner edge with a right angular web **39** (Figure 5) which is formed with a vertical channeled portion **40** and a parallel channeled portion **41**. A vertical meeting rail **42** extends from the sill **11** to the head member **13** midway between the jambs **12** and, as shown in Figure 5, is formed with a transverse web **43** in which is formed parallel channels **44** and **45** which are in confronting relationship with channels **41** and **40**, respectively, of the web **39**. The web **43** has a coextensive outer flange **46** which confronts the extended edge **47** of the outer facing **14** of the jamb **12**. Disposed against the inner surfaces of the flange **46** and the extended edge **47** are the side edges of a pane of glass **48**. A sash retaining strip **49** extends along the sides, top and bottom of the pane **48** and is provided with a longitudinal recess **50** in which is disposed a tubular rubber or neoprene sealing strip **51** which bears firmly against the inner surface of the pane **48**. The sash retaining strip **49** has an extension **52** coextensive with its outer edge which lies in the channel **41** of the web **39** and bearing against the side of the retaining strip **49** opposite the pane **48** is a neoprene or rubber sealing strip **53**, disposed in a longitudinal slot or recess **54** in a sash frame **55** in which is mounted a glass pane **56**. A sash locking strip **57** has one edge disposed in the channel **40** and its outer edge bearing against the sash frame **55**. Four of these sash locking strips are employed to hold the glass **56** in place, one at the top and the bottom and one at each side. These strips are removable by inserting a suitable instrument in holes **58** (Figure 1) and withdrawing from their respective channels and when removed, the sash frame **55**, retaining strips **49** and pane **48** may be removed from the inside of the window.

Inasmuch as the sash retaining strips **49**, sash frame **55** and sash locking strips **57** are the same about the entire perimeter of the glass panes **48** and **56**, the same reference numerals have been used to identify like parts throughout as applied to these elements.

Adjacent the double sash assembly just described is a wire mesh screen **59** mounted in a frame **60**. The screen frame **60** has a recessed flange **61** about its inner surface into which the edges of the screen are thrust and held therein by means of a rubber or plastic retainer **62**. The outer surface of one side of the screen frame **61** bears against the extended edge **47** of the jamb facing **14** which confronts the extended edge holding the station-

ary sash while the opposite edge of the frame bears against the extended edge 63 of the meeting rail 42.

The meeting rail 42 is formed with a transverse web 64 opposite its web 43 which is shaped to define a channel 65. This channel confronts a like channel 66 formed in the transverse web 67 corresponding to the web 39 of the opposite jamb. The screen frame 61 is locked from the inside by means of pivoted cleats 68, secured to the sides of the frame by means of screws 69 and rotatable to engage in the channels 65 and 66, as shown in Figures 1 and 5.

The lower ends of the dual sashes 48 and 56 are retained by a horizontal support 70 (Figure 3) whose ends are brought up flush against the jambs 12 on each side. This support is formed with a horizontal web 71 shaped to define a channel 72 to receive the extension 52 of the sash retaining rail 49 and a parallel channel 73 for receiving the sash locking strip 57. The panel 73*a* extends from one jamb 12 to the other and an extension 74 along its upper edge provides a bearing for the lower edge of the glass pane 48 in the same manner that the extension 75 on the facing 14 of the head member 13 and the extensions 47, 46 and 53 of the jambs 12 and meeting rail 42, serve to support the top and side edges of the pane 48.

A depending flange 76 formed integral with the horizontal web 71 bears flush against a vertical portion 77 of the sill 11 and is secured thereto by screws 78. The panel or skirt 73*a* of the support 70 extends down and engages the inclined portion 79 of the sill 11 and conceals the screws 78.

At the opposite end of the sill 11 the screen frame 60 is supported on an inwardly turned flange 80 on the panel 73*a* and is secured thereto by screws 81 (Figure 4) extending upwardly through the flange 80 into the bottom of the screen frame 60.

Mounted for horizontal sliding displacement in the sash channel 82 (Figure 4) of the frame is a dual pane sash frame 83. This sash frame is composed of a horizontal top member 84, a horizontal bottom member 85 and a pair of vertical side members 86 (Figure 5). The vertical side members 86 are secured to the top and bottom members 84 and 85 by means of bolts 87 (Figure 5), only the bottom bolts being visible in the drawing.

The sliding sash frame is supported by means of a pair of fiber rollers 88, mounted on shafts 89 whose ends are journaled in the sides of the bottom member 85 of the sash frame 83. The rollers engage a longitudinal rail 90, formed as an integral part of the horizontal portion 91 of the sill 11. The upper end or top member 84 of the sash 83 extends above the lower edge of the extension or depending flange 32 of the head member 13 and, when the frame 83 is shifted to a position to the left in Figure 1, it may be lifted until the lower edge of the bottom member 85 clears the rail 90 and moved outwardly and thus removed from its channel 82 for cleaning, replacement of weatherstrips 35 or for any other reason. However, when the sash frame 83 is moved to the right, as viewed in Figure 1, it cannot be removed for the reason that the downwardly projecting protuberance 92 (Figure 3), affixed to the underside of the head member 13 prevents upward displacement of the sash frame in this position. The protuberance 92 may be in the form of a rail or spaced apart rollers, as desired. The projection or protuberance is located at the side of the main frame occupied by the screen 59 as a safety measure, to discourage unlawful entry by precluding removal of the sash frame from the outside after cutting the screen.

The sash frame 83 has a glass pane 93 whose side edges bear against confronting flanges 94 integral with the side members 86 of the frame. A sash retaining strip 95 has a longitudinally coextensive recess containing a sealing strip 96 which is in firm engagement with the inner surface of the glass. An extension 97 on the retaining strip 95 enters a channel 98 formed in each of the end members 86 of the sash frame 83. Parallel with the glass pane 93 is an inner pane 99 whose edges are in sealing engagement with a frame 100. This frame is held in the sash frame 83 by means of locking strips 101 slidably received in channels 102 formed in the side members 86 of the sash frame 83.

The arrangement just described for retaining the glass panels 93 and 99 is identical and interchangeable with the arrangement previously described for retaining the glass panels in the stationary frame.

Each side member 86 of the sash frame has an elongate vertically disposed projection 103 which serves as an operating handle for shifting the sash frame from side to side. The handles are each offset inwardly of the edges of the frame so that said edges may pass behind the extensions 31 (Figure 5) of the jambs 12.

In Figure 2 is shown in detail a sash lock which consists of a cylinder 104 formed on a base 105 which is secured by screws 106 to one of the side members 86 of the sash frame 83. A cylindrical extension 106 depends from a cap 107 which has an annular groove 108 in its underside between its periphery and the depending extension 106 to receive the upper end of the cylinder 104. The cylinder 104 has an annular groove 109 adjacent its upper end to receive a set screw 110 which allows the cap to turn on the cylinder but prevents displacement of the cap. A handle 111 is made integral with the cap and by rotating the handle, the cap is turned to rotate the extension 106 which has a deflected end 112 engaging a like deflected end 113 of a cylindrical plunger 114. The plunger 114 is vertically reciprocable but held against rotation by a pin 115 extending through a slot 116 in the wall of the cylinder 104. The plunger 114 is held in raised position by a coil spring 117 whose upper end bears against a shoulder 118, formed by reducing the lower end of the plunger, and at its lower end against an internal flange 119 on the lower end of the cylinder 104.

When the handle 111 is rotated, the plunger 114 will be moved downwardly into a selected hole in the longitudinally spaced group of holes 120 in the sill 11, thus to lock the sash at any desired position.

In any position of the sash frame 83, it is adequately sealed against infiltration of dust or moisture first by the weatherstrips 35 which extend around the top and sides thereof and finally by the inverted U-shaped strip 121, shown in transverse section at the bottom of Figure 3 and which occupies the space 122 in the lower or bottom member 85 between the rollers 88. The weatherstrip 121 straddles the rail 90 and slides thereon without friction. The strip 121 is constructed in substantially the same manner as the strips 35 and like these strips, is readily removable for replacement.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. In a window construction, the combination comprising a horizontally elongate frame composed of a head member and jambs of the same shape in transverse section and a sill, said jambs and head member having mortised exterior facings whose inner edges extend inwardly of the opening defined by said frame to form sash frame bearing surfaces, a vertical meeting rail at the midsection of said frame having a facing corresponding to the facings of said jambs and head member, a stationary double glazed sash mounted in said frame between one end thereof and said meeting rail, a screen frame mounted between the opposite end of said frame and said meeting rail, said stationary sash and screen frame bearing against said facings, a second double glazed sash frame removably secured in said elongate frame for longitudinal sliding displacement therein, interior flanges formed on said jambs, and said head member defining a sash channel for said second sash frame, a rail formed longitudinally on said sill, rollers carried by the bottom member of said second sash and operating on said rail, weatherstrips carried by said stationary and said second sash frame and said meeting rail and means prohibiting removal of said second sash from said elongate frame except at a point opposite said stationary sash frame.

2. In a window construction, an elongate horizontal frame, spaced apart jambs of identical shape in transverse section, each having an integral web in which is formed coextensively longitudinal inner and outer channels confronting analogous channels in the companion jamb, a head member of a shape identical to that of said jambs, and having a web formed with channels corresponding to those of said jambs, a sill having a web formed with channels corresponding to the channels of said head member and jambs, a facing formed integral with the web of said sill whose upper edge extends beyond said web, a vertical meeting rail formed with opposing webs, each having channels confronting the

grooves in opposite jambs, said meeting rail being formed with a facing extending inwardly of each of its webs, an outer glass pane bearing at its edges against the inner surface of the facings of one of said jambs, said sill, said head member and said meeting rail, a sash retaining strip having a longitudinal extension frictionally held in the outer of said channels, an inner sash frame in stationary juxtaposition with said sash retaining strip and carrying a glass pane, a sash frame holding strip frictionally retained in the inner of said channels, a screen frame bearing against the extended edges of the facings of said head member, jambs and sill adjacent said outer glass pane, means receivable in the outer channels of the webs of said meeting rail and the other of said jambs for holding said screen in position, a sliding sash frame whose vertical and horizontal members are formed with parallel confronting channels identical to those of said jamb, head member and sill, glass panes retained in the channels of said sliding sash, rollers supporting said sliding sash on said sill, means on the vertical members of said sliding sash for actuating the same, and means carried jointly by said sill and said sliding sash for locking the latter in adjusted positions.

3. In a window construction, an elongate horizontal frame comprising jambs and a head member of the same transverse cross-sectional shape, a sill and a vertical meeting rail, said jambs, head member and meeting rail each having integral webs defining continuous pairs of confronting channels, a glass pane within the confines of the outer channels between one jamb and said meeting rail, a screen frame within the confines of the outer channels between the opposite jamb and said meeting rail, a longitudinally coextensive rail on said sill, a vertically displaceable slidable sash disposed inwardly of said glass panel and screen frame and having rollers supporting said sliding sash on said rail, parallel glass panes in said sliding sash, weatherstripping between said sliding sash and said meeting rail, means for actuating said sliding sash and means carried by said sill and sliding sash for locking the same in adjusted positions.

4. The structure of claim 3, an inwardly extending flange formed on said jambs and said head member interiorly of longitudinal rail of said sill defining a channel for said sliding sash and means within the channel of said head member inwardly of said screen frame for prohibiting upward displacement of said sliding sash.

5. In a window construction, a longitudinally elongate frame having spaced apart jambs and a head member of identical shape in transverse cross-section and a vertical meeting rail midway between said jambs, a sill, said jambs, head member, sill and meeting rail each being formed with a web having a pair of parallel, coextensive channels in confronting relationship to define an opening between said meeting rail and each of said jambs of equal size, a stationary double glazed sash retained in said channels in one of said openings, a screen frame secured in the other of said openings, a longitudinally coextensive rail on said sill forwardly of said stationary sash and said screen frame, a sliding sash having rollers engaging said rail and movable from one end of said elongate frame to the other and means for locking said sliding sash in adjusted positions in said elongate frame.

6. The structure of claim 5, weather sealing means between said meeting rail and said sliding sash and an inverted, substantially U-shaped weatherstrip within the lower horizontal member of said sliding sash frame and embracing the rail on said sill.

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