Oct. 15, 1935. G. R. CARL 2,017,652

WINDOW

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Fig. 1.

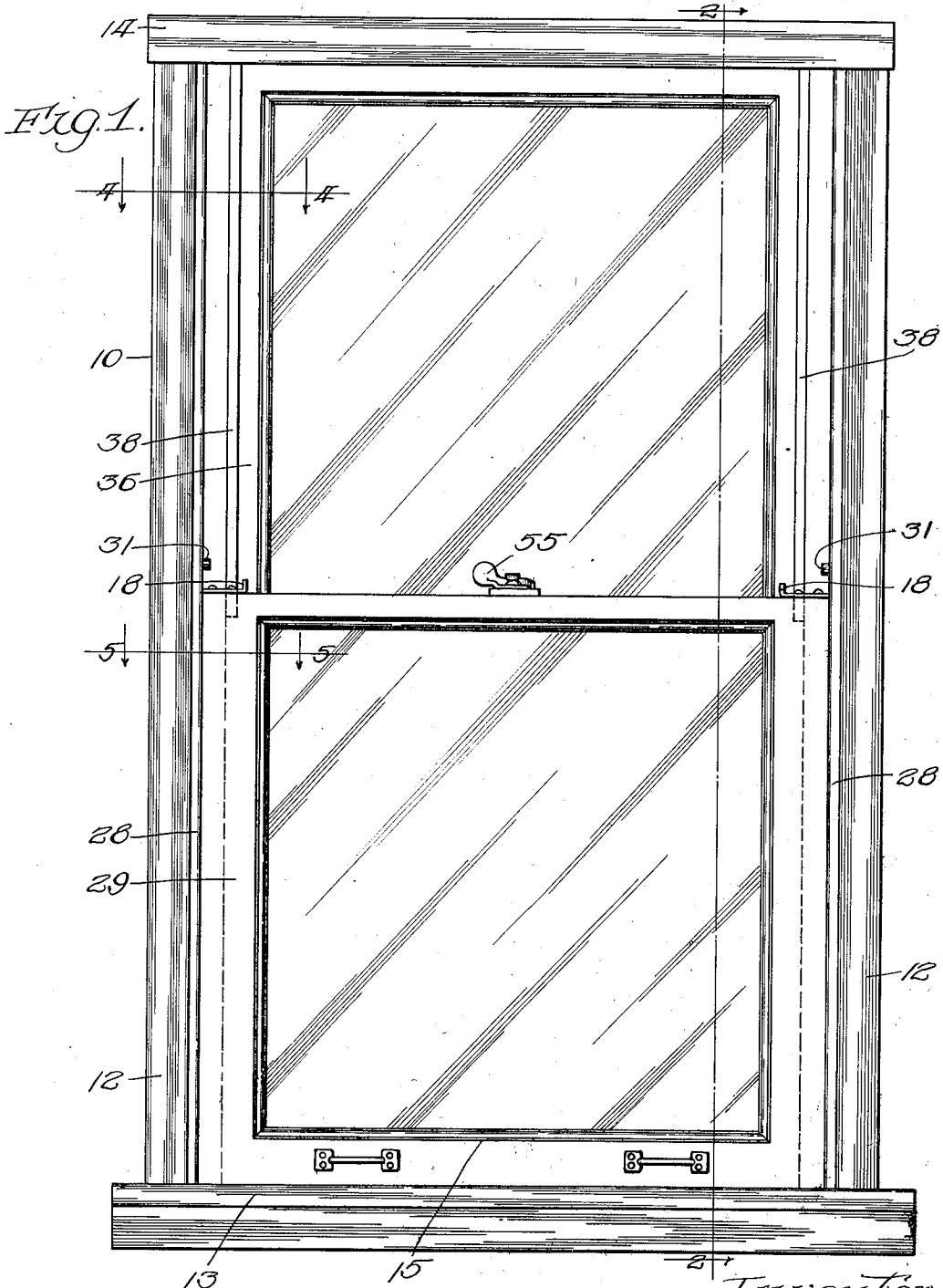

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Fig. 3.

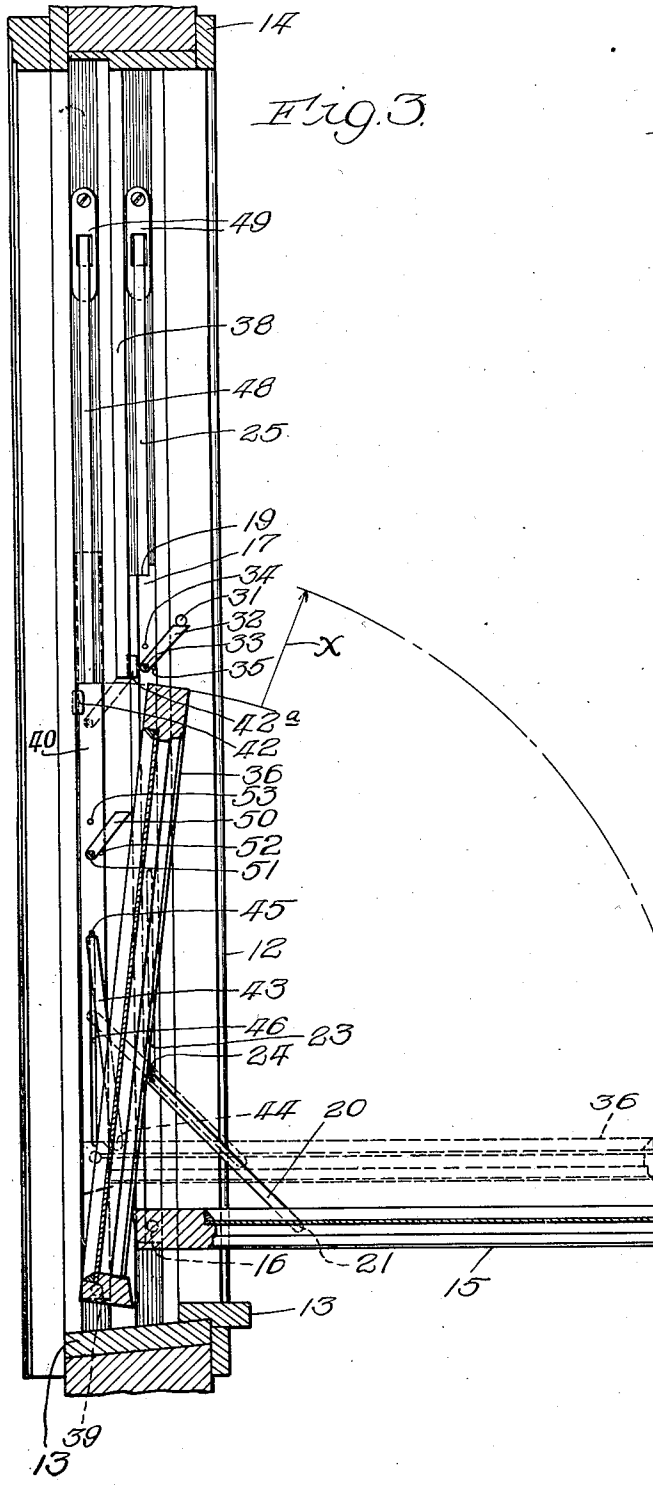

Fig. 2.

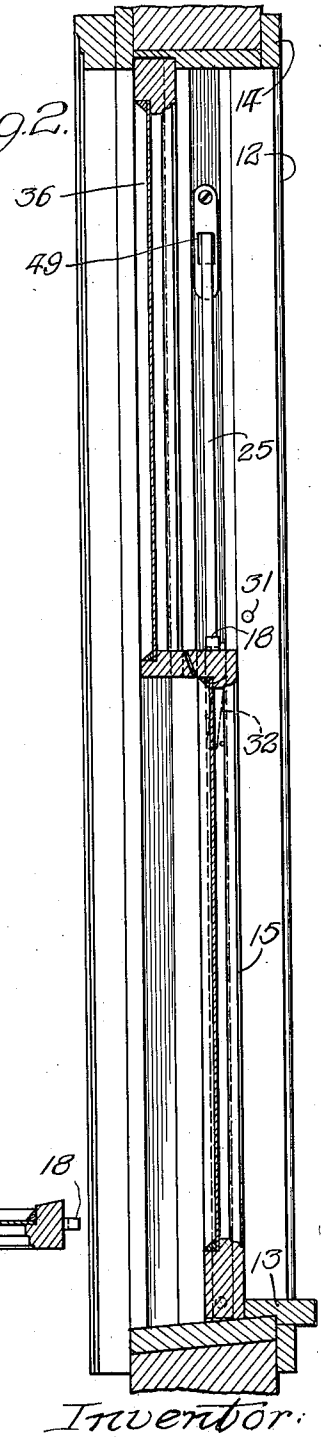

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Fig. 4.

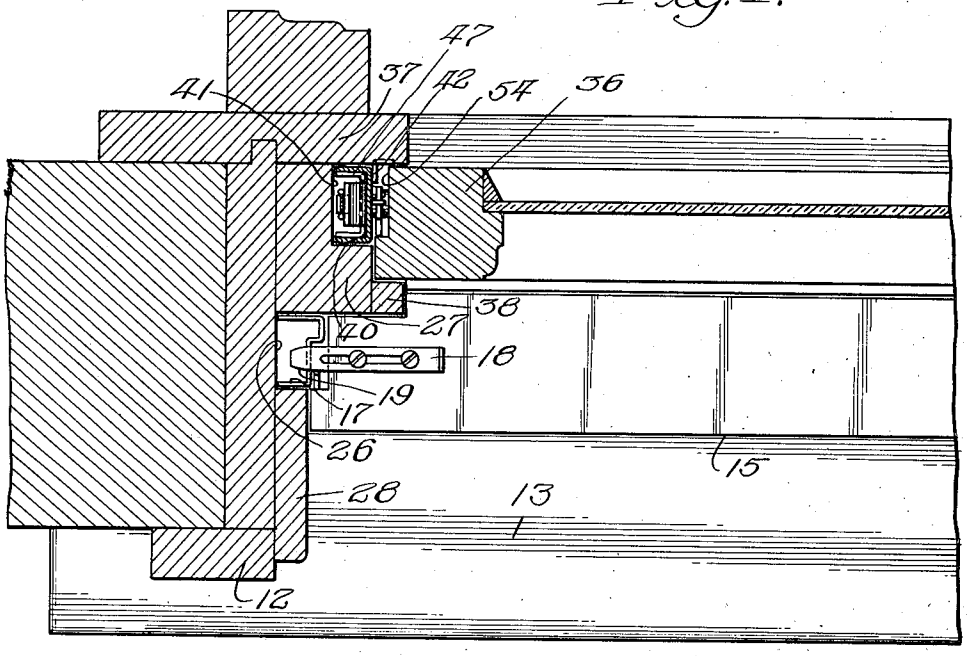

Fig. 5.

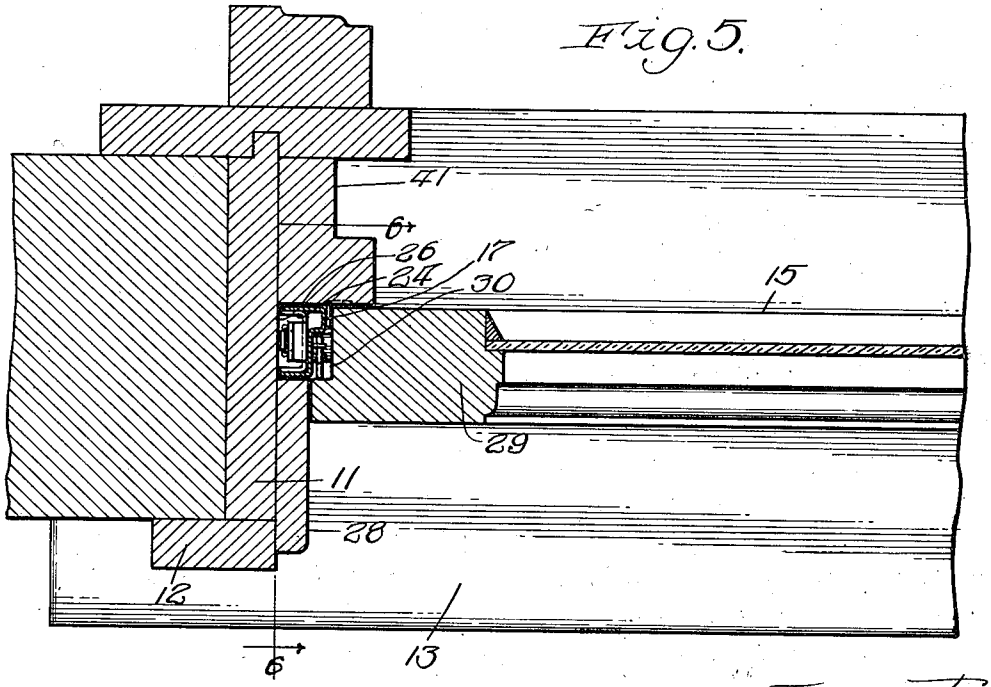

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Fig. 6.

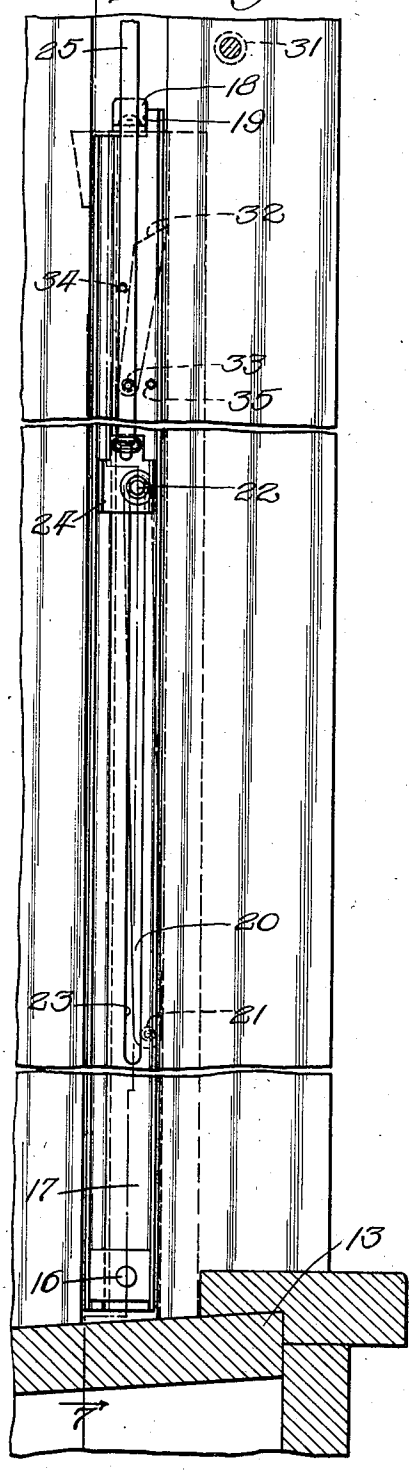
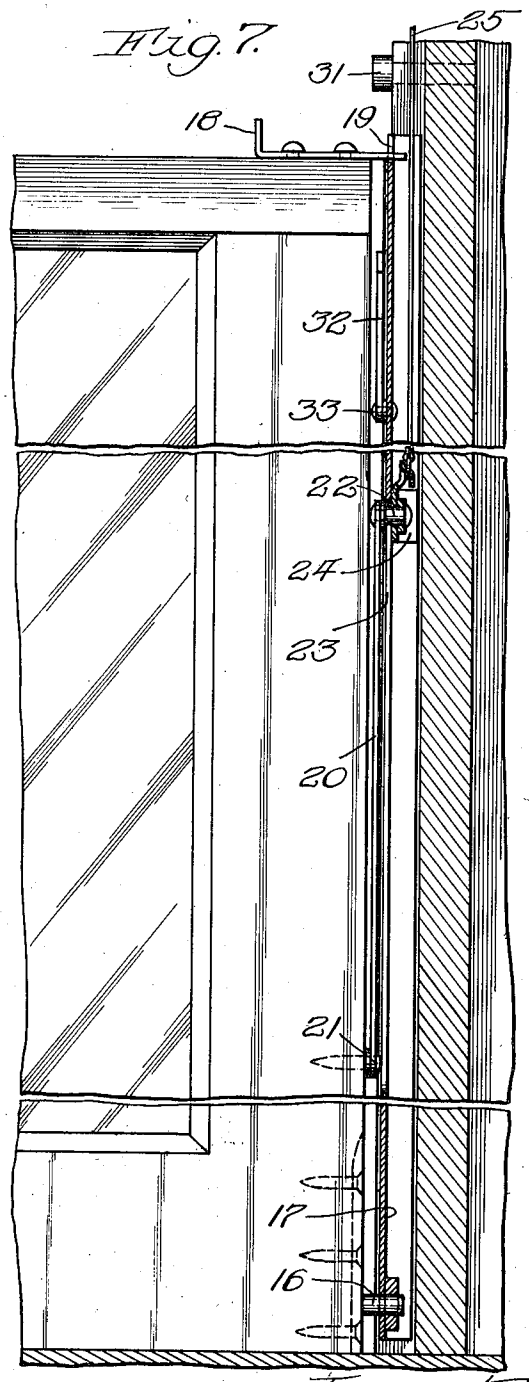


Fig. 7.



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Patented Oct. 15, 1935 2,017,652

UNITED STATES PATENT OFFICE

2,017,652

WINDOW

Gustav R. Carl, Chicago, Ill.

Application January 12, 1934, Serial No. 706,374

5 Claims. (Cl. 20—49)

This invention relates to windows of the double hung or sliding type in which the sash are pivoted so that they may be swung inwardly as for cleaning or the like.

The objects of this invention are to provide an improved window which may be economically manufactured and which will be particularly durable and convenient in operation; to provide a double hung window with means for pivoting the sash and means for counter-balancing the same whereby the sash may be held in various vertical or tipped positions; to provide a window of the character indicated with novel stops or guides for facilitating or controlling the movements of the upper and lower sash; and to provide such further improvements in construction and advantages in operation as will appear from the following description.

In the accompanying drawings illustrating this invention,

Figure 1 is a front or inside view;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 2 but showing the sash in different positions;

Figure 4 is an enlarged detail taken on the line 4—4 of Figure 1;

Figure 5 is an enlarged detail taken on the line 5—5 of Figure 1;

Figure 6 is a sectional view taken on the line 6—6 of Figure 5; and

Figure 7 is a sectional view taken on the line 7—7 of Figure 6.

A window frame or casement 10 is provided with sides or stiles 11, trim 12, stool or sill 13 and top 14. The lower sash 15 is provided with pivots 16 adjacent to the lower edge for pivoting the same to slides or supporting members 17 which preferably extend upwardly to approximately the top of the sash and which are formed to make close contact with the sides thereof. The upper edge of the sash may be fastened or locked to the slides 17 by means of slidable catches 18 which may be moved outwardly, as shown in Figures 4 and 7, to engage with notches or recesses 19 in the slides. Links 20 have their lower ends pivoted at 21 to the sides of the sash a short distance above the pivots 16 and when in normal position extend upwardly along the sides of the sash as shown particularly in Figures 6 and 7. The upper ends of the links have pins or trunnions 22 which extend outwardly through slots 23 in the slides 17. These trunnions engage with channel-shaped supports or bearings 24 which fit closely in the slides 17 and are adapted to move longitudinally of the same. The bearings 24 are secured to the lower ends of the counterweight ribbons or cords 25 which are connected with any suitable counterweights or spring balance devices (not shown), such as are commonly used for this purpose.

The slides or supporting members 17 operate in grooves 26 in the frame, these grooves being conveniently formed by means of auxiliary stile strips 27 and 28. The lower sash is adapted to swing between the strips 28 and the side rails 29 of the sash are recessed as shown at 30 to allow for the clearance for the slides 17 and the links 20.

Combined stop and guide members 31 are provided on the stiles or sides of the frame as shown in Figure 1, these stops being arranged at a short distance above the top of the lower sash when it is in closed position and being adapted to register with the side rails of the sash to prevent outward movement of the same when the sash is moved upwardly. Two pawls or detents 32 are pivoted at 33 to the slides 17 at a short distance from the upper ends thereof. These pawls are preferably actuated by gravity and are limited in their movements by stop pins 34 and 35.

When the lower sash is locked or fastened to the slides 17 by means of the catches 18, it may be moved up and down as an ordinary double hung window. If the catches 18 are not fastened, the stops 31 will serve as guides to prevent the sash from swinging outwardly on its pivots.

When the lower sash is to be swung inwardly it is raised a short distance so as to clear the sill 12 and so that the upper edge will pass under the stops 31. The initial outward movement of the sash tends to raise the slides 17 until the pawls or detents 32 engage with the stops 31 thus preventing further movement of the slides. As the sash is swung downwardly, as indicated in Figure 3, the links 20 swing out and pull down against the tension of the counterweight strips 25. The trunnions 22 are guided in the slots 23 in this movement and the parts are preferably so proportioned that the sash will be held in any adjusted position. The downward swinging movement of the sash is stopped when the trunnions engage with the lower ends of the slots, thus preventing further movement of the links. When the sash is swung to normal position the pawls 32 are swung inwardly so that they will not engage with the stops 31 and they are concealed and held in retracted position by the sash.

The top sash 36 slides between the stile pieces

27 and is guided by the frame members 37 and parting strips 38. The parting strips stop just below the lower edge of the sash when it is in raised position so that the top of the sash will clear the same when the sash is swung inwardly. The top sash is supported in a manner similar to the bottom sash, being provided with pivots 39 which engage with channel shaped slides 40 which slide in recesses 41 in the stile pieces 27. Guide brackets or angles 42 are secured to the rear frame members 37 and serve to hold the slides 40 in their grooves when the frame is swung inwardly and similar guides 42a are provided for the slides 17. Links 43 have their lower ends pivoted at 44 to the sides of the sash and their upper ends are provided with trunnions or pins 45 which extend through slots 46 in the channels or slides 40. The trunnions or pins 45 engage with channel shaped bearings 47 which slide in the channels 40 and which are connected to the lower ends of the counter-weight cords or strips 48 which pass up over pulleys 49 and connect with any suitable counter-balance devices.

The slides 40 are provided with pawls or detents 50 which are pivoted thereto at 51 at a suitable distance from the tops of the channels. These pawls are preferably arranged so that they will normally swing inwardly by gravity and their swinging movement is limited by pins 52 and 53. These pawls are adapted to engage at times with the lower ends of the parting strips 38 as shown in Figure 3. The side rails of the sash are grooved or recessed as shown at 54 to provide clearance for the links 43 and the pawls 50.

When the upper sash is to be swung inwardly, the lower sash is first swung in to provide room therefor as shown in Figure 3. The upper sash is then slid downwardly until the top edge will clear the parting rails 38 as shown in full lines in said figure. Thereupon the window is raised somewhat as indicated by the arrows X until the pivoted edge is above the surface of the lower sash. The top sash may then be swung inwardly on its pivots, the upward movement of the slides 40 being prevented by the pawls 50 which swing out and engage with the lower ends of the parting rails 38. The continued swinging movement of the sash tends to pull the links down against the tension of the counter-balance members so that the sash is balanced in all positions. The downward movement is stopped when the trunnions 45 engage with the lower ends of the slots 46. When the upper sash is again swung back to normal position it will swing the pawls 50 back to retarded position so that the sash will again be free to move up and down in its grooves in the usual manner. When both of the windows are closed they may be locked by means of a catch 55 as shown in Figure 1, and other attachments such as commonly used for windows of this kind may be provided.

While I have shown and described a window provided with two sashes it is apparent that certain features of the invention may be utilized for a window having a single sash or a plurality of sashes and it is also apparent that changes may be made in the details of construction or arrangements of the parts in order to adapt the same for different installations and therefore I do not wish to be limited to the construction herein shown and described except as specified in the following claims, in which I claim:

1. A window including a frame having guideways in the sides thereof, slides mounted in said guideways, a sash pivoted at its lower edge to said slides and adapted to fit closely between the slides, links pivotally connected at their lower ends to the sash at a distance above the sash pivots, pins secured to the upper ends of the links and projecting through slots in said slides, bearings engaging with said pins, counterbalances having flexible members connected with said bearings, catches for securing the upper edge of the sash to the slides, stop members on the sides of the frame serving to guide the sash in its upward movement, but permitting the sash to be swung when in a lowered position, and means on said slides adapted to engage with the stop members to prevent the upward movement of the slides when the sash is swung inwardly.

2. In a double hung window, the combination of a casement having vertical grooves therein, channels slidably mounted in said grooves, a sash pivotally mounted at the lower ends of the channels and fitting closely therebetween, links having their lower ends pivotally connected with the sash, trunnions secured to the upper ends of the links and extending outwardly through slots in the channels, said slots serving to limit the upward and downward movement of the trunnions therein, bearings engaging with said trunnions, counter balances connected with the bearings, stops secured to the sides of the casement above the sash when it is in lowered position, and pawls secured to the channels and adapted to engage with said stops when the sash is swung inwardly, the sash being arranged to move the pawls out of engaging position when the sash is adjusted for vertical movement.

3. In a double hung window, the combination of a frame having auxiliary stile strips for the top sash, parting strips secured to the stile strips, said stile strips having recesses therein, an upper sash, channel shaped slides of approximately the same length as the sash mounted in said recesses and adapted to slide therein, pivots connecting the lower portions of the sash with said channels, links pivoted to the sash, pins at the upper ends of said links extending through elongated slots in the slides, bearings in the slides connected with said pins, counterbalances connected with said bearings, pawls secured to the slides which are normally inactive but which are adapted to engage with the lower ends of the parting strips to prevent the upward movement of the sash when it is swung inwardly, a lower sash which is wider than the upper sash, grooves in the window frame, slides arranged in said grooves which are substantially the same length as the lower sash, pivotal connections between the lower ends of the slides and the sash, links pivoted to the lower sash and extending upwardly, pins on the upper ends of the links engaging with elongated slots in the slides, bearings engaging with said pins, counterbalances connected with said bearings, stops on the frame and pawls on the last named slides which are normally inactive but which are adapted to engage with said stops when the lower sash is swung inwardly.

4. A double hung window including a frame, auxiliary stile strips extending longitudinally of the frame and forming a narrower opening for the upper sash than for the lower sash, parting strips extending approximately to the lower edge of the opening for the upper sash, recesses extending longitudinally of the auxiliary stile strips, slides mounted in said recesses, an upper sash which is narrower than the lower sash and which engages closely with the slides, pivotal

connections between the lower portions of the upper sash and the slides, links pivoted to the sides of the upper sash and arranged in rabbets therein, pins at the upper ends of the links extending outwardly through slots in the slides, said slots serving to guide and to limit the movement of the pins, counter-balances connected with said pins, pawls secured to the slides and adapted to engage with the lower ends of the parting strips to prevent the upward movement of the sash when it is in swinging position, a lower sash, vertically movable slides arranged in grooves in the frame and making close contact with the lower sash, pivotal connections between the lower portion of the lower sash and said slides, links pivoted to said lower sash, pins at the upper ends of said links engaging with slots in the slides which are adapted to guide and limit the movement of the pins, counter-balances connected with said pins, stops on the frame and pawls on the last named slides adapted to engage with the stops when the lower sash is in swinging position.

5. In a window construction, the combination of a sash, slides pivotally connected at their lower ends to the sash and adapted to guide the same in its vertical movement, a frame having guideways in which said slides are mounted, stops on the sides of said frame, pawls on the slides for engagement with the stops, said pawls being pivoted at their lower ends and means for limiting the swinging movement thereof, said pawls being held in retracted position by the sash when the sash is in sliding position, and adapted to move outwardly by gravity into position to engage with the stops when the sash is swung inwardly on its pivots.

GUSTAV R. CARL.