Dec. 9, 1952 H. R. BROLEMAN, JR 2,620,523

AWNING TYPE WINDOW

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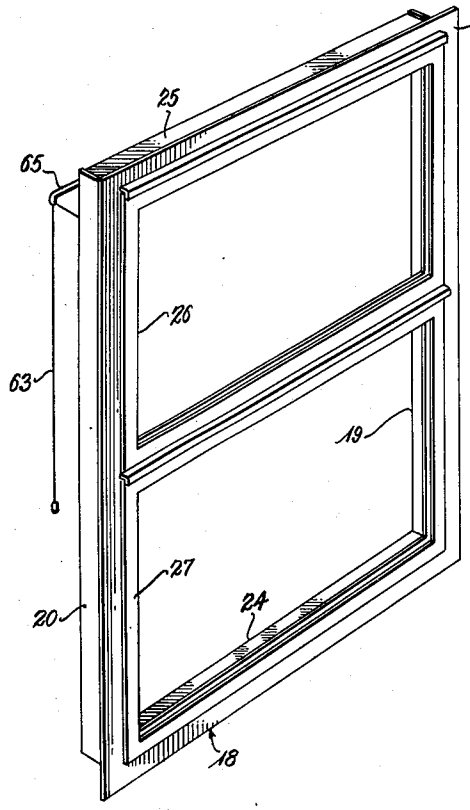


Fig. 1.

Fig. 2.

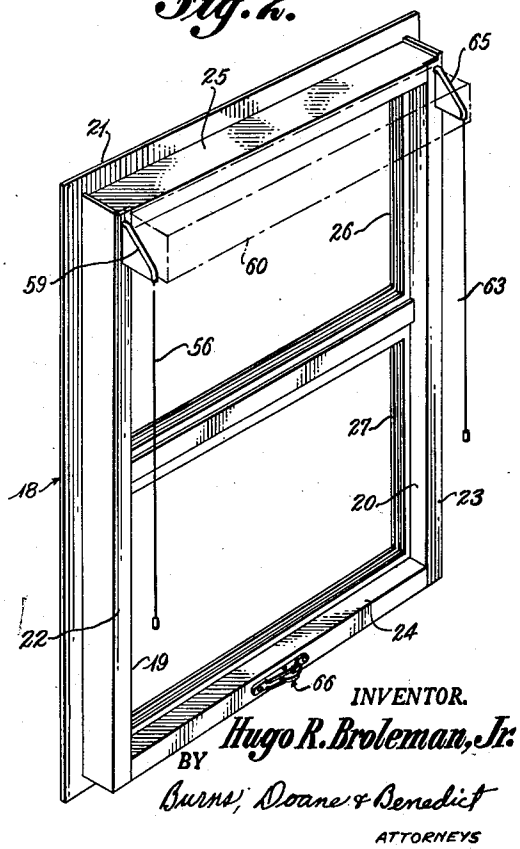


Fig. 15.

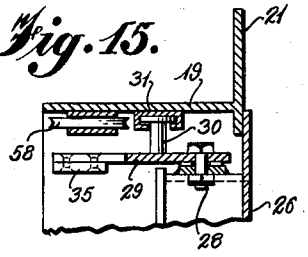
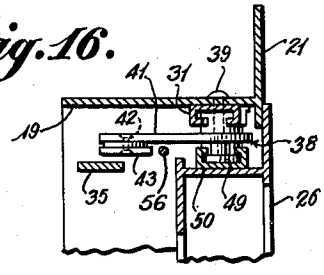


Fig. 16.



INVENTOR.
Hugo R. Broleman, Jr.
BY
Burns, Doane & Benedict
ATTORNEYS

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AWNING TYPE WINDOW

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Fig. 3.

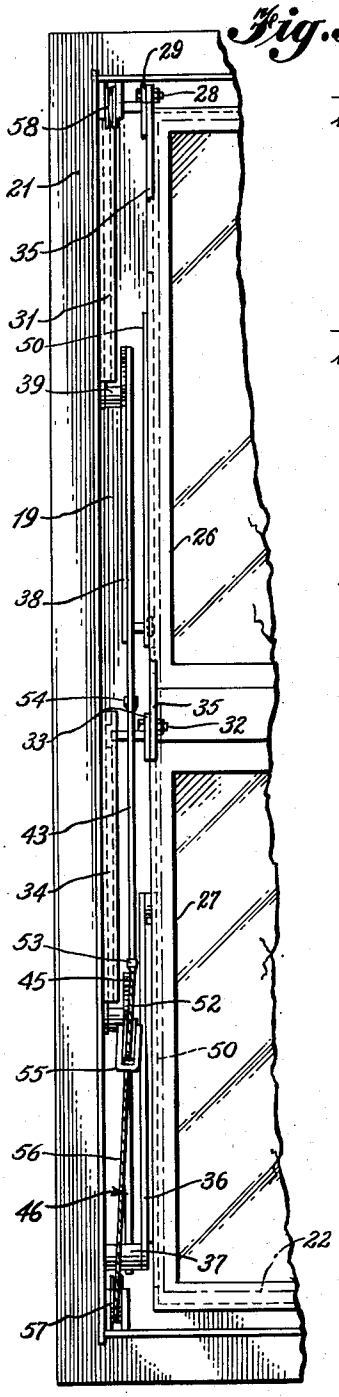


Fig. 4.

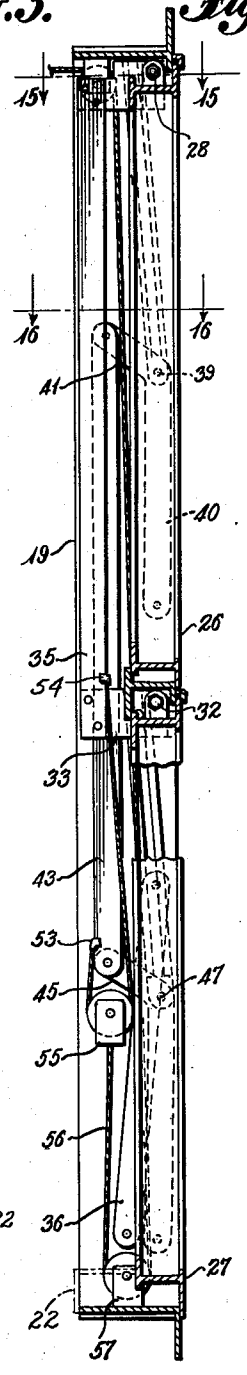
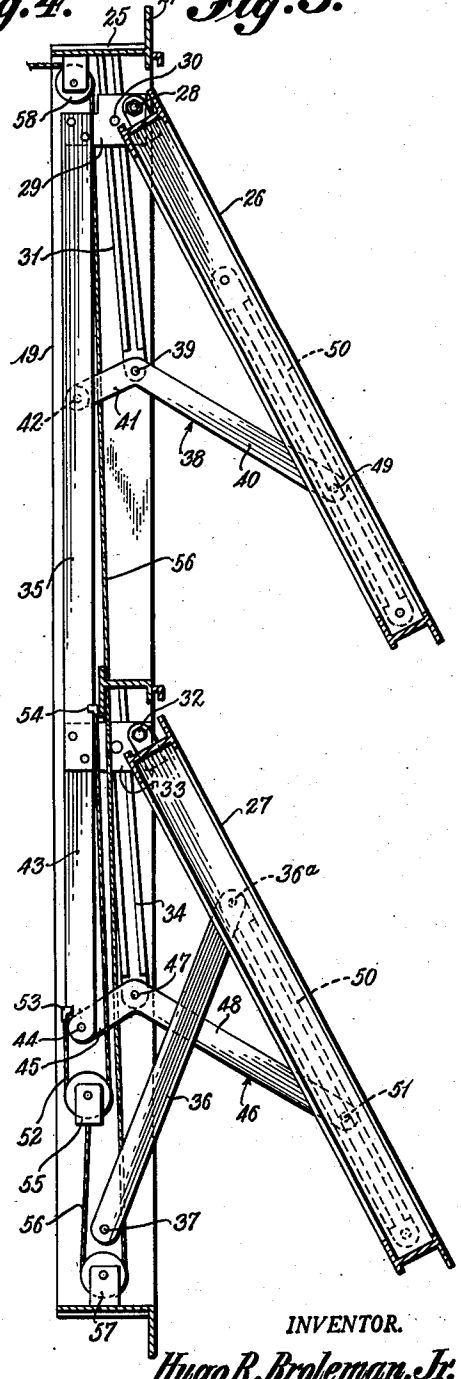


Fig. 5.



INVENTOR.

BY Hugo R. Broleman, Jr.

Burns, Doane & Benedict

ATTORNEYS

Dec. 9, 1952 H. R. BROLEMAN, JR 2,620,523

AWNING TYPE WINDOW

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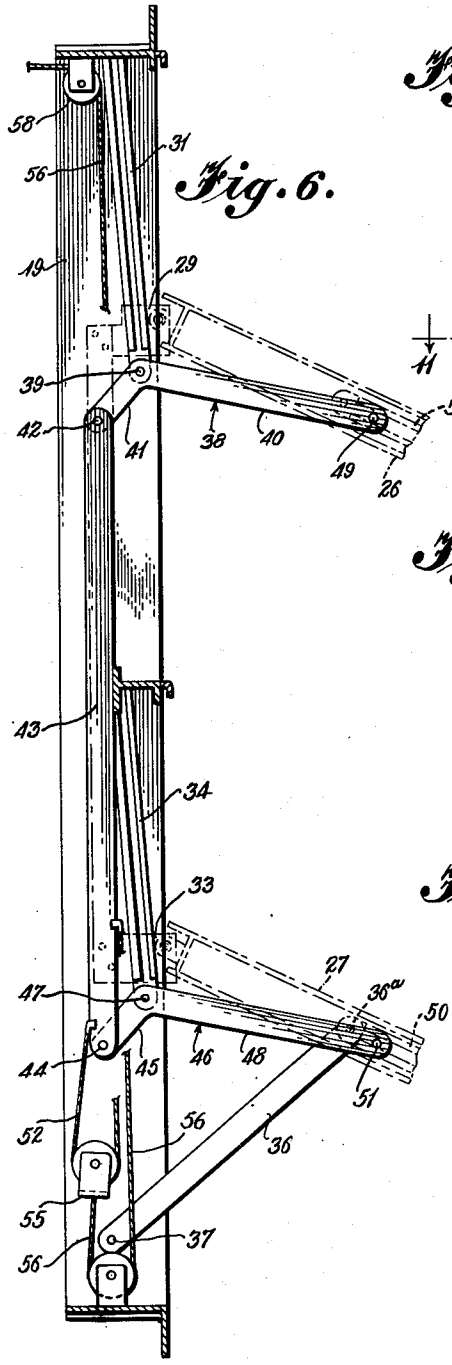


Fig. 6.

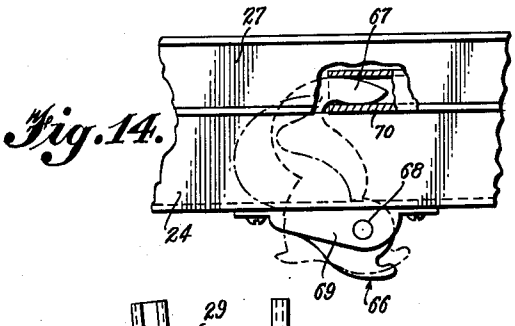


Fig. 14.

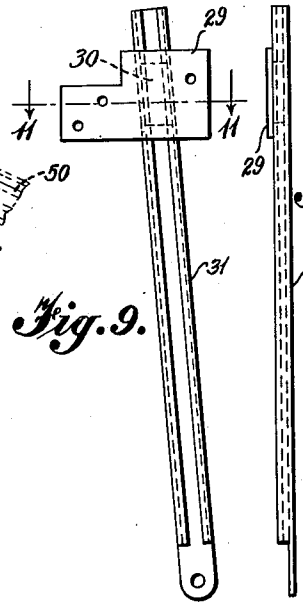


Fig. 9.

Fig. 10.

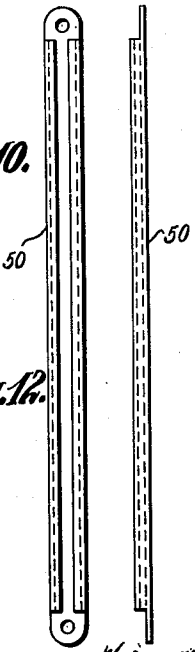


Fig. 12.

Fig. 13.

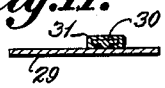


Fig. 11.

INVENTOR.
Hugo R. Broleman, Jr.
BY
Burns, Doane & Benedict
ATTORNEYS

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AWNING TYPE WINDOW

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Fig. 7.

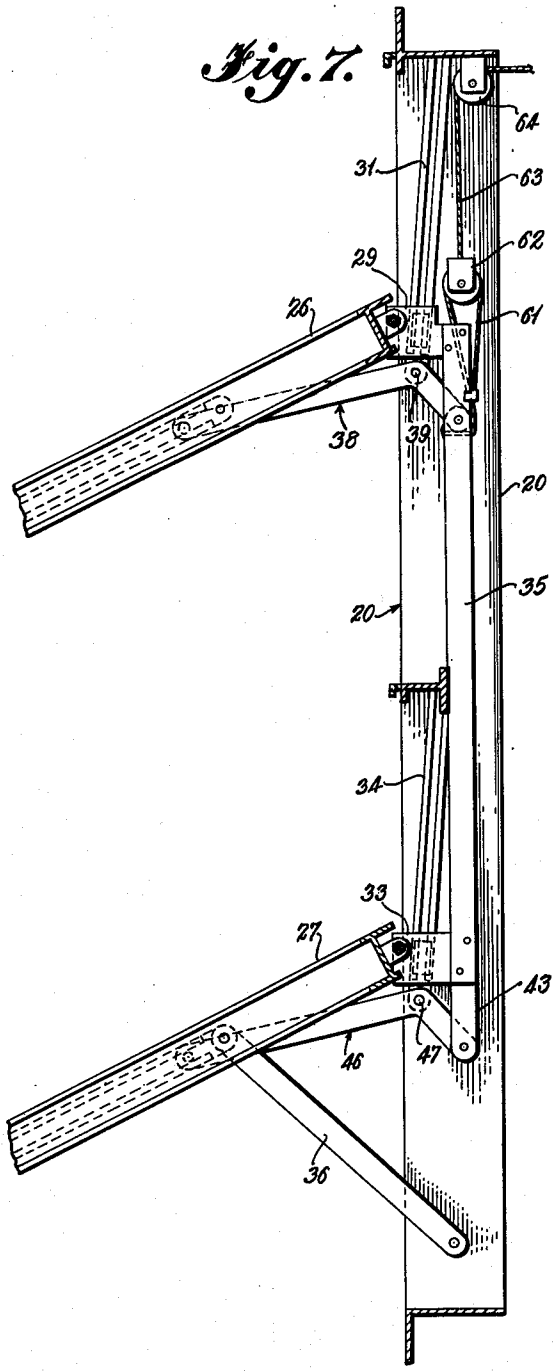
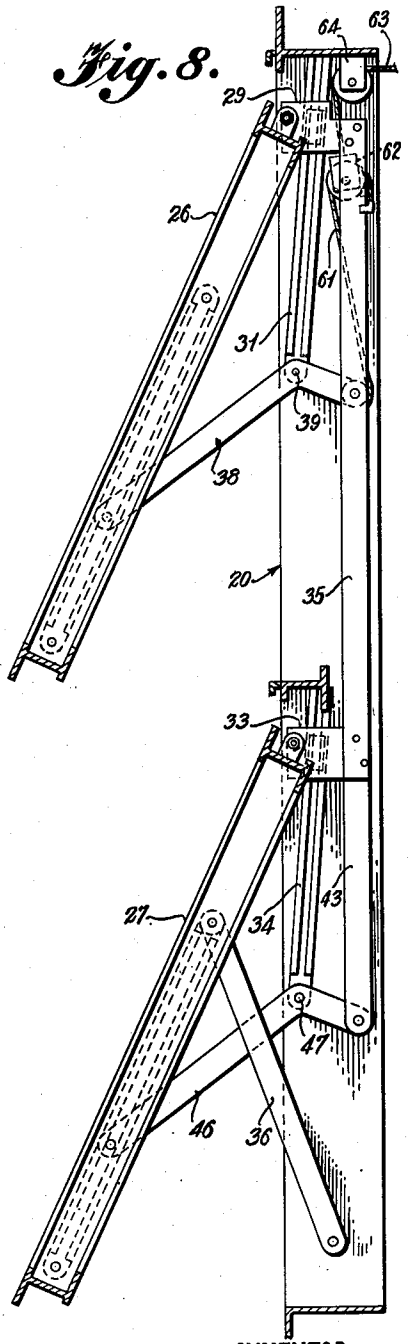


Fig. 8.



INVENTOR.

Hugo R. Broleman, Jr.

BY

Burns, Doane & Benedict

ATTORNEYS

Patented Dec. 9, 1952 2,620,523

UNITED STATES PATENT OFFICE

2,620,523

AWNING TYPE WINDOW

Hugo R. Broleman, Jr., Orlando, Fla.

Application January 23, 1952, Serial No. 267,743

8 Claims. (Cl. 20—42)

1

The present invention relates to an awning type window consisting of a window frame and a plurality of sashes mounted so as to be tiltable outwardly for opening of the window. Windows of the awning type are not broadly new. My invention relates to certain improvements which are described in detail hereinafter.

There has long been a demand for a cord operated window which could be easily and quickly opened or closed with little effort and which would automatically lock itself in intermediate positions of adjustment. There has also been a demand for windows which could be operated without movement of Venetian or other blinds which may be associated with the window.

One of the primary objects of my invention is to provide an awning type window which is cord operated and which can be opened or closed rapidly and with a minimum of effort. Another object of my invention is to provide an awning type window which can be opened or closed without disturbing Venetian blinds, drapes, curtains or other window coverings. Another object of the invention is to provide a window of the awning type which automatically locks itself in any desired position of adjustment. Another object of the invention is to provide an awning type window having operating mechanism in which the initial opening movement of a window sash consists predominantly of tilting or pivotal movement of the sash about its upper edge, whereas subsequent opening movement of the sash consists predominantly of downward movement of the upper edge of the sash accompanied by pivotal movement of the sash about a horizontal axis intermediate its vertical length. Still another object of the invention is to provide an awning type window having hollow box-like jambs which house the opening and closing mechanism, and which have removable covers permitting access to the opening and closing mechanism for servicing or repair. Another object of the invention is to provide an awning type window in which the opening mechanism is positioned in the box jamb at one side of the window while the closing mechanism is positioned in the box jamb at the opposite side of the window.

The foregoing and other objects and advantages of the invention will be better understood by reference to the following description and the accompanying drawings, wherein:

Figure 1 is a perspective view showing the exterior of a window embodying my invention;

Figure 2 is a perspective view illustrating the interior of the window shown in Figure 1;

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Figure 3 is a longitudinal sectional view of the side of the window in which the opening mechanism is housed, portions of the mechanism being omitted for clarity of illustration;

Figure 4 is a vertical sectional view looking toward the side of the window in which the opening mechanism is housed, the window being shown in closed condition;

Figure 5 is a view similar to Figure 4 but illustrating the window partially open;

Figure 6 is a view similar to Figure 5 showing the window opened to a greater extent;

Figure 7 is a vertical sectional view looking in the direction of the side of the window in which the closing mechanism is housed, the window being shown in open position;

Figure 8 is a view similar to Figure 7 but illustrating the position of the elements after partial closing movement of the window;

Figure 9 is a side elevational view of one of the head blocks and the slide with which it is associated;

Figure 10 is an edge elevational view of the elements shown in Figure 9;

Figure 11 is a sectional view taken in the direction of the arrows along the line 11—11 of Figure 9;

Figure 12 is a side elevational view of one of the slides for the outer ends of the pivot arms;

Figure 13 is an edge elevational view of the element shown in Figure 12;

Figure 14 is a fragmentary view showing the latching mechanism for the window;

Figure 15 is a transverse sectional view looking in the direction of the arrows along the line 15—15 of Figure 4; and,

Figure 16 is a transverse sectional view looking in the direction of the arrows along the line 16—16 of Figure 4.

The window frame is designated generally by the reference numeral 18 and it includes a left box-like jamb 19 for housing the window opening mechanism, and a right box-like jamb 20 for housing the window closing mechanism. The window frame 18 may be conveniently made of metal and the entire window assembly may be sold as a unit for insertion in a window opening of a building. The outer flange 21 is of assistance in positioning and retaining the window assembly in a wall. The jamb 19 preferably has a removable cover 22 to permit access to the opening mechanism, and the jamb 20 has a similar removable cover 23 to permit access to the closing mechanism. The sill of the frame is designated by the reference nu-

meral 24 and the header by the reference numeral 25.

I have illustrated and described the invention as embodied in a window having two vertically spaced sashes, although it will be apparent that the invention is not limited to the use of two sashes. The upper and lower sashes are designated by the numerals 26 and 27, respectively.

The opening mechanism can be best understood by reference to Figures 3 to 6, inclusive. The upper corner of the upper sash 26 is pivotally secured by means of a bolt or rivet 28 to a head block 29. The head block 29 has secured thereto a stud 30, best shown in Figure 11, which is slidable in the guideway of a slide 31. The upper corner of the sash 27 is pivotally secured by means of a bolt or rivet 32 to a head block 33 which is slidable along a slide 34. The head blocks 29 and 33 are rigidly connected by means of a head block connecting bar 35.

The lower sash 27 has pivotally secured thereto at fixed point 36a, the outer end of a stabilizer link 36, the inner end of this link being pivotally connected to the jamb at 37.

A pivot arm 38 is pivotally secured to the jamb 19 at 39. The outer long arm 40 of the pivot arm 38 is secured to the side edge of the sash 26 for both pivotal and sliding movement relative thereto. The short inner arm 41 of the pivot arm 38 is angularly offset from the longer arm 40, as shown in the drawings. The short inner arm 41 is pivotally connected at 42 to the upper end of a pivot arm connecting bar 43. The lower end of the pivot arm connecting bar 43 is pivotally secured at 44 to the short inner arm 45 of a pivot arm 46 which is pivotally secured to the jamb 19 to 47. The longer outer arm 48 of the pivot arm 46 is secured to the side edge of the sash 27 for both pivotal and sliding movement relative thereto.

As indicated above, the long arms 40 and 48 of the pivot arms 38 and 46, respectively, are secured to the side edges of the sashes 26 and 27 to permit both pivotal and sliding movement of the arms relative to the sashes. The arm 40 of the pivot arm 38 is provided with a stud 49 which is slidable in the guideway of a slide 50 which is best illustrated in Figures 12 and 13. The slide 50 is riveted or otherwise secured to the side edge of the sash 26. The outer end of arm 48 of the pivot arm 46 is provided with a similar stud 51 which is slidable in the guideway of a slide 50 secured to the side edge of the sash 27.

A link cord 52 has one of its ends secured to the pivot arm connecting bar 43 by means of a suitable clip 53. The opposite end of the link cord 52 is connected to the head block connecting bar 35 by means of a clip 54. A floating pulley 55 is positioned on the link cord 52. An opening cord 56 is secured to the floating pulley 55. The opening cord extends downwardly around a lower stationary pulley 57, thence upwardly through the jamb 19, over an upper stationary pulley 58 and outwardly through a guide 59. The guide 59 positions the free end of the cord inwardly from the window so that a Venetian blind or other window covering will not interfere with access to the opening cord. In Figure 2 I have illustrated in dot-dash lines the header mechanism housing for a Venetian blind, such housing being designated by the reference numeral 60.

Figure 4 illustrates the window in closed position. The head blocks 29 and 33 are at their extreme upper limits of movement in their respective slides 31 and 34. It will be noted that the slides 31 and 34 are inclined inwardly toward their upper ends, so that the upper ends of the sashes are drawn against the frame in the closed position. The stabilizer link 36 is approximately vertical and the short arms 41 and 45 of the pivot arms 38 and 46 are inclined approximately 30° above the horizontal. The studs 49 and 51 on the outer ends of the pivot arms 38 and 46 are at their extreme lower limit of travel in the slides 50.

To open the window tension is applied to the free end of the opening cord 56. This results in downward movement of the floating pulley 55. The link cord 52 permits the head block connecting bar 35 and the pivot arm connecting bar 43 to move independently. The initial downward movement of the floating pulley 55 will result predominantly in downward movement of the pivot arm connecting bar 43 with consequent pivotal movement of the pivot arms about their fixed pivotal axes 39 and 47. This pivotal movement of the pivot arms 38 and 46 will result in outward movement of the bottoms of the sashes 26 and 27. During this initial movement, the sashes 26 and 27 pivot about their respective head blocks 29 and 33. Figure 5 illustrates the positions of the several elements after initial downward movement of the floating pulley 55. It will be seen that the short inner arms 41 and 45 of the pivot arms are now inclined approximately 30° below the horizontal. The window sashes have been opened to the extent illustrated. The head blocks 29 and 33 have moved downwardly in their respective slides by only a limited extent. Further pulling on the opening cord 56 results in further downward movement of the floating pulley 55 with consequent further opening of the sashes. The position of the elements after further opening of the sashes is illustrated in Figure 6. This further opening has resulted predominantly from downward movement of the upper edges of the sashes and their respective head blocks. It will be seen that the head blocks 29 and 33 have moved to approximately the lower limit of their travel in their respective slides 31 and 34. The stabilizer link 36 occupies the position shown in Figure 6, and the studs 49 and 51 in the outer ends of the pivot arms have moved to approximately their upper limits of travel in the slides 50.

The closing mechanism shown in Figures 7 and 8 is similar to the opening mechanism, and for that reason the same reference numerals are applied to corresponding elements. The closing mechanism is housed within the box-like jamb 20. The sash 26 is pivotally secured to the head block 29 and the sash 27 is pivotally secured to the head block 33. The head blocks 29 and 33 are rigidly secured to each other by means of a head block connecting bar 35. The pivot arms 38 and 46 are identical to the comparable members described above and they are joined by a pivot arm connecting bar 43. A stabilizer bar 36 is provided which holds the sashes 26 and 27 in any desired position of adjustment in spite of gusts of wind or other forces which may be applied to them. The head block 29 is slidable in a slide 31 while the head block 33 is slidable in a slide 34. A link cord 61 has one of its ends secured to the head block connecting bar 35 while its opposite end is connected to the pivot arm connecting bar 43. A floating pulley 62 is positioned on the link cord 61. A closing cord 63 is secured to the floating pulley 62. This closing cord extends upwardly over a stationary pulley 64 and

through a guide 65 similar to the guide 59 described above.

When tension is applied to the closing cord 63, the floating pulley 62 will be elevated. The initial effect on the sashes is demonstrated by a comparison of Figures 7 and 8. The predominant movement during the initial closing operation will be upward movement of the upper ends of the sashes and their associated head blocks 29 and 33. Further upward movement of the floating pulley 62 will cause the head blocks 29 and 33 to move slightly to their extreme upper limits of movement, but the predominant effects of such further upward movement of the floating pulley 62 will be upward movement of the pivot arm connecting bar 43, pivotal movement of the pivot arms 38 and 46 about their pivotal axes 39 and 47, and inward pivotal movement of the sashes 26 and 27 about their respective head blocks. It will be seen that such closing movement can continue until the sashes are completely closed. It can also be seen that the closing movement is essentially the reverse of the opening movement described above.

I prefer to provide a latch 66 in the window sill 24 for the purpose of latching the lower sash 27. This latch is best illustrated in Figure 14. The hook 67 is pivotally connected at 68 to brackets 69 which are secured to the inner surface of the sill 24. The hook 67 may enter an opening in the sash 27 and engage a shoulder 70 to prevent opening of the lower sash 27 and consequently to prevent opening of the upper sash. The hook 67 can be moved from the full line position shown in Figure 14 to the dotted line position to permit opening of the window.

I have found that the opening and closing mechanism which I have illustrated and described is particularly effective for use with windows of the casement type. The fact that the initial opening movement of the window is predominantly an outward swinging motion of the bottoms of the sashes and the fact that the further opening movement is predominantly a downward movement of the upper ends of the sashes are essential in obtaining smooth operation with little effort on the part of the operator. The reverse operation in closing the windows also contributes to facility of operation. The use of the link cords 52 and 61 and the floating pulleys 55 and 62 make these two types of movement possible since these elements permit independent relative movement of the head block connecting bar 35 and the pivot arm connecting bar 43.

I have referred to certain of the elements herein as cords, but it will be apparent that other suitable flexible elements can be used, and the term "cords" is intended to be generic to equivalent elements.

I have illustrated and described what I now consider to be the preferred embodiment of my invention, but it will be understood that various alterations and modifications may be resorted to without departing from the broader scope of my invention as defined by the following claims.

Having thus described my invention, I claim:

1. An awning type window comprising a window frame and a plurality of window sashes vertically spaced within said frame, a stabilizing link pivotally connected to a side of said frame and to a side of one of said sashes, a head block pivotally connected to each of said sashes, means for guiding said head blocks for substantially vertical movement in said frame, a head block connecting bar connecting said head blocks, a pivot arm for each of said sashes, said pivot arms being pivotally connected intermediate their ends to a side of said frame and being connected at one of their ends to a side of their respective sashes for both pivotal and sliding movement thereon, a pivot arm connecting bar pivotally connected to the opposite ends of said pivot arms, and means for effecting movement of said pivot arm connecting bar and said head block connecting bar to move said sashes to open and close said window.

2. An awning type window comprising a window frame and a plurality of window sashes vertically spaced within said frame, a stabilizing link pivotally connected to a side of said frame and to a side of one of said sashes, a pivot arm for each of said sashes, said pivot arms being pivotally connected intermediate their ends to a side of said frame and being connected at one of their ends to a side of their respective sashes for both pivotal and sliding movement thereon, a pivot arm connecting bar pivotally connected to the opposite ends of said pivot arms, a head block pivotally connected to each of said sashes, means for guiding said head blocks for substantially vertical movement in said frame, a head block connecting bar connecting said head blocks, and means for effecting vertical movement of said pivot arm connecting bar and said head block connecting bar while permitting relative movement between said bars.

3. An awning type window comprising a window frame and a plurality of window sashes vertically spaced within said frame, a stabilizing link pivotally connected to a side of said frame and to a side of one of said sashes, a pivot arm for each of said sashes, said pivot arms being pivotally connected intermediate their ends to a side of said frame and being connected at one of their ends to a side of their respective sashes for both pivotal and sliding movement thereon, a pivot arm connecting bar pivotally connected to the opposite ends of said pivot arms, a head block pivotally connected to each of said sashes, means for guiding said head blocks for substantially vertical movement in said frame, a head block connecting bar connecting said head blocks, and means for effecting vertical movement of said pivot arm connecting bar and said head block connecting bar while permitting relative movement between said bars, said means comprising a link cord extending from said pivot arm connecting bar to said head block connecting bar, a pulley on said linking cord, and means for effecting vertical movement of said pulley.

4. An awning type window comprising a window frame having hollow box jambs, a plurality of window sashes vertically spaced within said frame, a stabilizer link pivotally connected at one end to a side of said frame and pivotally connected at its other end to a side of one of said sashes, a head block pivotally connected to each side of each of said sashes, said head blocks being slidably positioned within their respective box jambs, a head block connecting bar within each box jamb connecting the head blocks therein whereby said head blocks are simultaneously slidable within said jambs, a pivot arm connected to each side of each of said sashes for both pivotal and sliding movement thereon, said pivot arms being pivotally secured intermediate their ends to their respective jambs, a pivot arm connecting bar within each of said box jambs and pivotally connected to the pivot arms therein whereby said pivot arms are simultaneously piv-

otally movable, window opening means within one of said box jambs and manipulable from the exterior thereof for lowering the head block connecting bar and the pivot arm connecting bar therein for moving said sashes to open said window, and window closing means within the other of said box jambs and manipulable from the exterior thereof for raising the head block connecting bar and the pivot arm connecting bar therein to move said sashes to close said window.

5. An awning type window comprising a window frame having hollow box jambs, a plurality of window sashes vertically spaced within said frame, a stabilizer link pivotally connected at one end to a side of said frame and pivotally connected at its other end to a side of one of said sashes, a head block pivotally connected to the upper end of each side of each of said sashes, said head blocks being slidably positioned within their respective box jambs, a head block connecting bar within each box jamb connecting the head blocks therein whereby said head blocks are simultaneously slidable within said jambs, a pivot arm connected to each side of each of said sashes for both pivotal and sliding movement thereon, said pivot arms being pivotally secured intermediate their ends to their respective jambs, a pivot arm connecting bar within each of said box jambs and pivotally connected to the pivot arms therein whereby said pivot arms are simultaneously pivotally movable, a first cord within one of said box jambs and manipulable from the exterior thereof for lowering the head block connecting bar and the pivot arm connecting bar therein for moving said sashes to open said window, and a second cord within the other of said box jambs and manipulable from the exterior thereof for raising the head block connecting bar and the pivot arm connecting bar therein to move said sashes to close said window.

6. An awning type window comprising a window frame having hollow box jambs, a plurality of window sashes vertically spaced within said frame, a stabilizer link pivotally connected at one end to a side of said frame and pivotally connected at its other end to a side of one of said sashes, a head block pivotally connected to the upper end of each side of each of said sashes, said head blocks being slidably positioned within their respective box jambs, a head block connecting bar within each box jamb connecting the head blocks therein whereby said head blocks are simultaneously slidable within said jambs, a pivot arm connected to each side of each of said sashes for both pivotal and sliding movement thereon, said pivot arms being pivotally secured intermediate their ends to their respective jambs, a pivot arm connecting bar within each of said box jambs and pivotally connected to the pivot arms therein whereby said sashes are simultaneously pivotally movable within said frame, a first link cord within one of said box jambs extending from said head block connecting bar to said pivot arm connecting bar therein, a first floating pulley on said first link cord, a window opening cord connected to said first floating pulley for pulling the same and said bars downwardly for moving said sashes to open said window, and a second link cord within the other of said box jambs extending from the head block connecting bar to the pivot arm connecting bar therein, a second floating pulley on said second link cord, and a window closing cord connected to said second floating pulley for pulling the same and said bars upwardly to move said sashes to close said window.

7. An awning type window comprising a window frame and a plurality of window sashes vertically spaced within said frame, a stabilizing link pivotally connected to a side of said frame and to a side of one of said sashes, a pivot arm for each of said sashes, said pivot arms being pivotally connected intermediate their ends to a side of said frame and being connected at one of their ends to a side of their respective sashes for both pivotal and sliding movement thereon, a pivot arm connecting bar pivotally connected to said pivot arms, a head block pivotally connected to the upper end of each of said sashes, means for guiding said head blocks for substantially vertical movement in said frame, a head block connecting bar connecting said head blocks, and means for effecting vertical movement of said pivot arm connecting bar and said head block connecting bar while permitting relative movement between said bars, the initial opening movement of said sashes being predominately pivotal movement of said sashes about said head blocks and further opening movement of said sashes resulting predominately from downward sliding movement of said head blocks.

8. In a window mechanism comprising a window frame and a plurality of window sashes vertically spaced within said frame, a stabilizing link pivotally connected to a side of said frame and to a side of one of said sashes, a head block pivotally connected to each of said sashes, means for guiding said head blocks for substantially vertical movement in said frame, a head block connecting bar connecting said head blocks, a pivot arm for each of said sashes, said pivot arms being pivotally connected intermediate their ends to a side of said frame and being connected at one of their ends to a side of their respective sashes for both pivotal and sliding movement thereon, a pivot arm connecting bar pivotally connected to the opposite ends of said pivot arms, a link cord connected to said head block connecting bar and to said pivot arm connecting bar, a floating pulley on said link cord, and means for moving said floating pulley to apply equal forces to said bars whereby movement of said bars at any given stage of operation of the mechanism will be substantially confined to movement of the bar then presenting the lesser resistance to movement.

HUGO R. BROLEMAN, JR.

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