July 7, 1953 M. HOFFMAN 2,644,206

AWNING TYPE WINDOW

Original Filed July 17, 1944 3 Sheets-Sheet 1

FIG. 1.

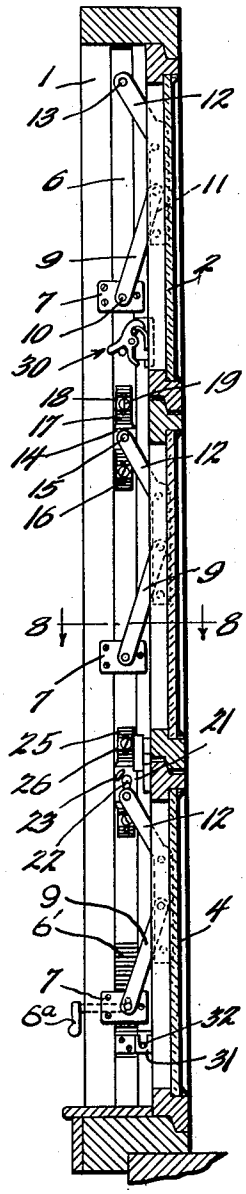


FIG. 2.

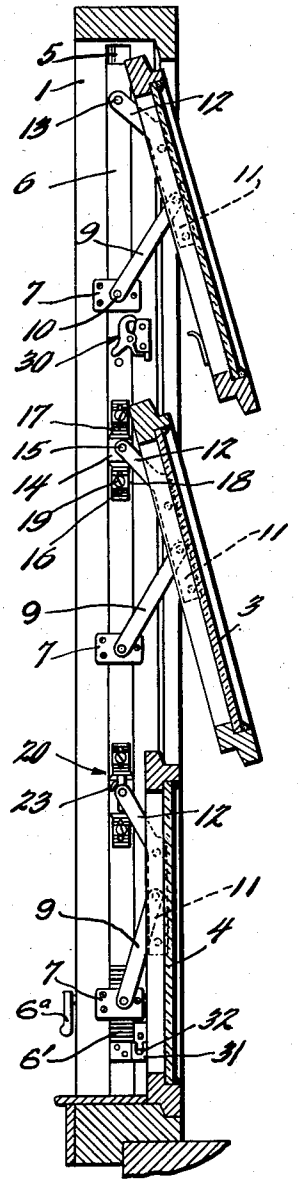
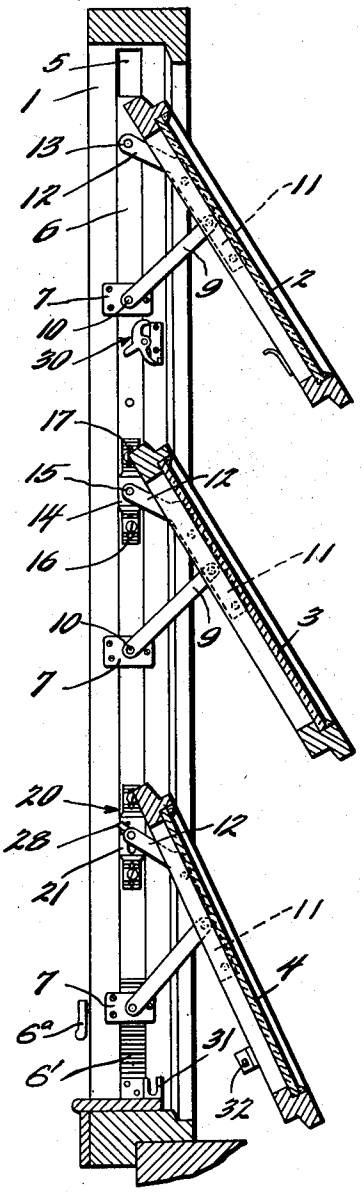


FIG. 3.



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FIG. 4.

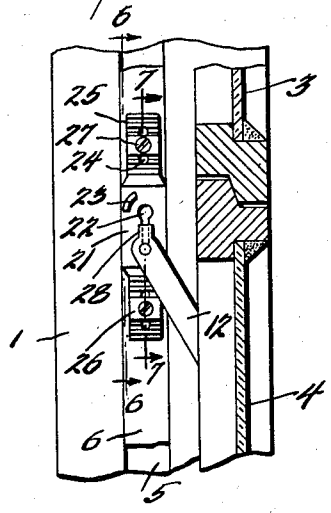


FIG. 5.

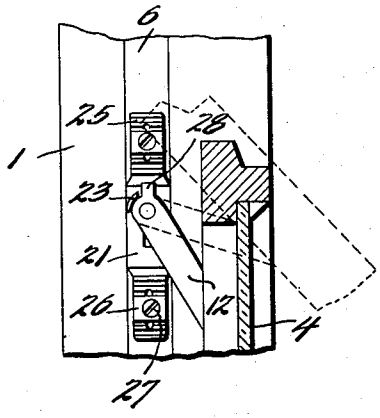


FIG. 6.

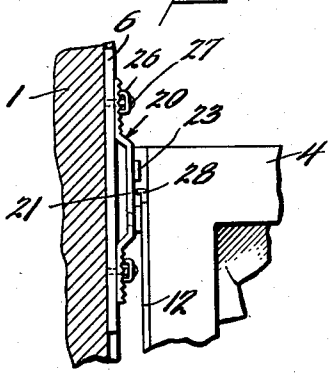


FIG. 7.

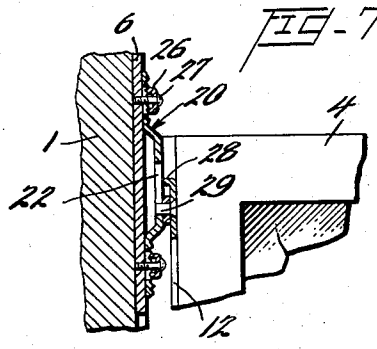


FIG. 8.

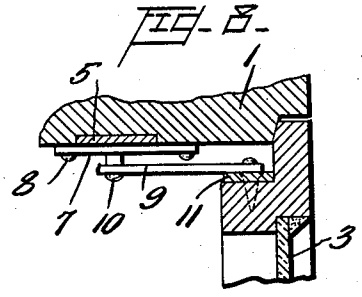


FIG. 9.

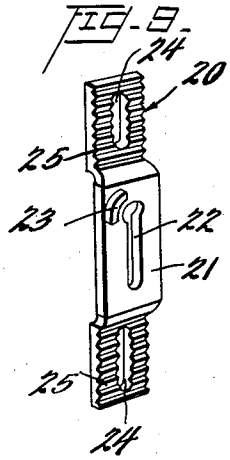
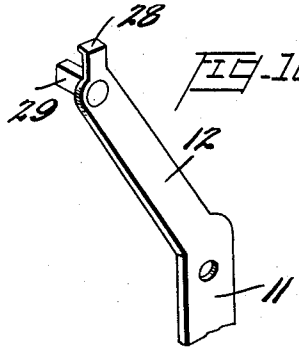


FIG. 10.



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FIG. 11.

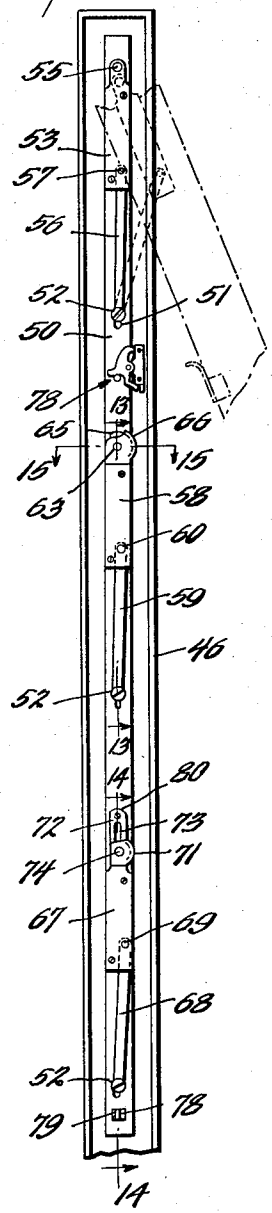


FIG. 12.

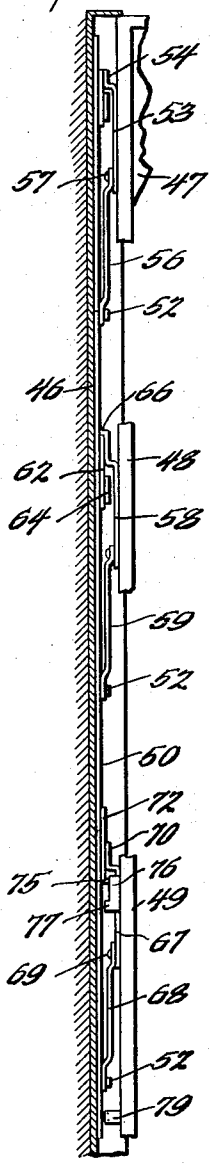


FIG. 13.

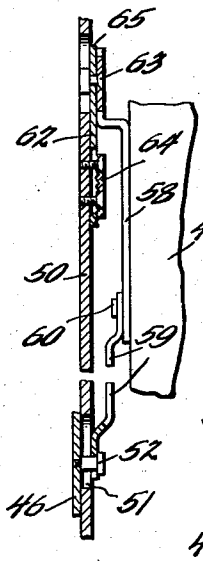


FIG. 14.

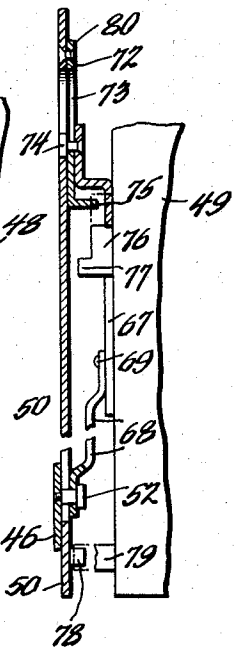


FIG. 15.

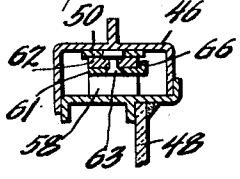
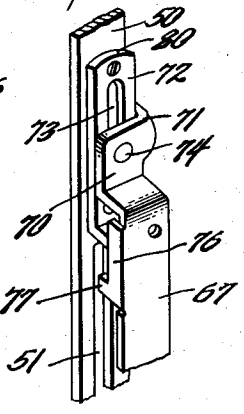


FIG. 16.



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UNITED STATES PATENT OFFICE

2,644,206

AWNING TYPE WINDOW

Max Hoffman, Miami, Fla.

Original application July 17, 1944, Serial No. 545,279. Divided and this application October 24, 1949, Serial No. 123,177

3 Claims. (Cl. 20—42)

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The present invention relates to improvements in awning type windows and the instant application is a division of my copending application, Serial No. 545,279, filed July 17, 1944, now Patent No. 2,486,407, issued November 1, 1949.

One of the important objects of the present invention is to provide an awning type window wherein a novel hinge unit is employed for connecting the swinging sashes to the slidable actuating bar.

Another important object of the present invention is to provide an adjustable hinge unit for the swinging sashes for effecting a tight closing of the sashes.

A still further object is to provide an adjustable hinge construction whereby the amount of opening of the swinging sashes may be varied.

Another object is to provide a hinge construction that can be readily and easily mounted and adjusted.

Other objects and advantages of the present invention will become apparent during the course of the following description when taken in conjunction with the accompanying drawings.

In the accompanying drawings forming a part of this specification and in which specification corresponding numerals designate corresponding parts throughout the several views:

Figure 1 is a vertical sectional view of a wooden window frame showing the awning type window mounted therein, with the swinging sashes illustrated in their fully closed and locked position, the hinge units being shown in elevation.

Figure 2 is a similar view, showing the upper two sashes in a partly opened position, while the lower sash is still in its closed position.

Figure 3 is a similar sectional view, showing the position of the swinging sashes when in their fully opened position.

Figure 4 is a detail fragmentary elevational view of one adjustably mounted bracket forming a salient part of the hinge unit, showing the position of the parts when the sashes are in a closed position.

Figure 5 is a similar view showing only one sash, and showing the relationship of the parts when the actuating bar has moved downwardly, the dotted lines illustrating the position of the parts when the sash is swung to an open position.

Figure 6 is a view taken at right angles to Figure 4 showing only one sash and showing the bracket in edge elevation; taken on the line 6—6 of Figure 4.

Figure 7 is a vertical sectional view taken on the line 7—7 of Figure 4.

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Figure 8 is a transverse section taken on the line 8—8 of Figure 1.

Figure 9 is a detail perspective view of the bracket forming a part of the hinge unit.

Figure 10 is a detailed perspective view of the offset arm that coacts with the bracket shown in Figure 9.

Figure 11 is a view similar to Figure 1 showing a modification of the invention as associated with a metal frame and metal window sashes.

Figure 12 is a view taken at right angles to Figure 11 showing the actuating bar and hinge units in edge elevation.

Figure 13 is a sectional view taken on the line 13—13 of Figure 11.

Figure 14 is a similar sectional view taken on the line 14—14 of Figure 11.

Figure 15 is a transverse section taken on the line 15—15 of Figure 11, and

Figure 16 is a detail fragmentary perspective view of the hinge unit associated with the sliding actuating bar and the lower sash.

With reference more particularly to Figures 1 to 10, inclusive, there is disclosed an awning type window associated with a wooden window frame, the latter being designated by the numeral 1. In the present instance, three sashes, 2, 3 and 4, respectively, are employed.

Mounted for vertical sliding movement in a suitable guide channel 5 formed in each side of the window frame 1 is the actuating bar 6. There are two of such bars, one in each side of the window frame for cooperation with the respective ends of the several sashes.

Plate-like members 7 are disposed across the slidable actuating bar and are secured to the frame 1 by suitable fasteners 8.

These plate-like members 7 not only serve to retain the slidable actuating bar in its channel, but also provide a means for securing one portion of the hinge unit that is arranged at the respective sides of each sash.

Each hinge unit includes a link 9 that is pivotally connected at its lower end, as at 10, to the co-operating plate-like member 7. The upper end of each link 9 is pivotally connected to the companion leg member 11 that is fixedly secured to the side edge of each sash. These members 11 constitute the sole means for supporting the sashes.

Each leg member 11 is formed with an offset arm portion 12 at its upper end, as is clearly illustrated in Fig. 10 of the drawings.

The leg members that are associated with the uppermost sash 2 have their offset portions pivot-

ally connected to the upper portions of the sliding actuating bars 6, as indicated at 13.

The hinge unit that is associated with the intermediate sash 3 includes a bracket 14 having a raised central portion to which the upper end of the offset arm is pivotally connected as at 15.

The end portions of this particular bracket are formed with longitudinal slots 16 and transverse serrations or teeth 17 are formed in the outer face of the slotted portions of the bracket 14 to coact with the edges of the lugs 18. Screws 19 pass through the lugs 18 and the respective slots 16 and are threaded in suitable openings provided therefor in the slidable actuating bar 6.

This construction provides a means for adjustably securing the hinge unit associated with each side of the intermediate or central sash to the actuating bar, thereby providing for a tight fit between the several sashes when the latter are in a fully closed position.

The plate 7 to which is pivoted the lower end of the link 9 associated with the lower sash extends across the lower portion of the actuating bar 6, which portion of the bar is formed with transversely extending serrations 6'. These serrations form racks which are engaged by operators 6a corresponding to those shown in the prior patent previously referred to.

Operator 6a is equivalent to the operator or actuating handle 43 as disclosed and described in my prior Patent No. 2,486,407 and is employed for locking the slidable actuating bar 6 in any vertically adjusted position, thus holding the swinging sashes in any angularly adjusted position.

The bracket forming a part of the hinge unit that is associated with the lower sash 4 is shown at 20 in Figure 9 of the drawings and this particular bracket has its raised intermediate portion 21 formed with a keyhole slot 22. An arcuate lug or shoulder 23 is formed on the raised portion 21 for a purpose to be presently described.

The end portions of the bracket 20 are also formed with longitudinal slots 24 similar to the slots 16 formed in the end portions of the bracket 14. Transverse serrations 25 are formed in the outer face of the slotted end portions of the bracket 20.

Channel-shaped lugs 26, similar to the lugs 18 have their edges coacting with the serrations 25 in the manner as clearly illustrated in Figures 4, 6 and 7. A screw 27 extends through each lug 26 and through the corresponding slot 24 and these screws are threaded into suitable threaded openings provided therefor in the slidable actuating bar 6. In this manner the hinge unit associated with the lower sash 4 is also adjustably connected to the slidable actuating bar.

The arm 12 of the hinge unit that is carried by the lower sash 4, is formed at its upper end with the flanged finger 28 that is adapted to cooperate with the shoulder 23, in a manner to be presently described.

A flat-faced pin 29 extends laterally from the arm 12 adjacent the flanged finger portion 28 and this pin is operable in the keyhole slot 22 formed in the raised portion 21 of the bracket 20 in a manner also to be hereinafter explained.

The aforementioned hinge unit construction as associated with the lower sash provides for the delayed opening of the lower sash.

The vertical swinging sashes are operated in the manner as more specifically described in my copending application, Serial Number 545,279, now Patent No. 2,486,401, issued November 1, 1949.

Suffice to state in the instant application that the upper and intermediate sashes operate simultaneously while the lower sash opens only after the upper and intermediate sashes have moved to a fully opened position. Also, the lower sash will close ahead of the other two sashes.

For locking the upper sash in its fully closed position, there is provided the locking means denoted generally by the numeral 30, which is also specifically described in my aforementioned application.

For the purpose of locking the lower sash in its fully closed position, there is provided the interengaging hook 31 carried by the lower end portion of the slidable actuating bar 6 and the lug 32 carried by the lower sash 4.

This locking means for the lower sash 4 is also more fully described in my pending application.

With the parts disposed in the position shown in Figure 1, all of the vertically swinging sashes are locked in their fully closed position and the actuating bar is in its uppermost position in its guides.

When the central sash 3 is pushed outwardly, the hinge units associated with the upper and intermediate sashes will cause the actuating bar 6 to move downwardly.

Further downward movement of the bar 6 will cause the keyhole slot 22 in the bracket 20 to cooperate with the pin 29, so that when this pin reaches the enlarged portion of the keyhole slot, the flanged finger portion 28 will coact with the arcuate shoulder 23 to cause the lower sash to swing outward to an open position. This movement is what I term as the delayed opening of the lower sash.

When all of the sashes have been swung to their fully open position, the parts assume the position illustrated in Figure 3.

When the sashes are returned to their fully closed position, the lower sash will assume its fully closed position ahead of the other two sashes. Thus the lower sash opens last and closes first. When the sashes are in a fully closed position they will be automatically locked in such position.

By adjusting the hinge units, the degree of opening of the sashes may be regulated in a positive and efficient manner, also, faster closing of the delayed opening sash can be effected, and tight closing of all of the sashes will be attained.

Attention is now directed to Figures 11 to 16, inclusive, wherein I have shown my invention as associated with a metal window frame and metal sashes, the hinge units in these figures being modified. However, the principles of operation are the same.

In this form, the channeled metal window frame is designated by the numeral 46 and the metal frames of the sashes are designated at 47, 48 and 49, respectively.

Mounted for vertical slidable movement in the channeled metal frame 46 is the actuating bar 50. This bar is formed with longitudinal slots 51, through which extend the pivot forming screws 52 that are threaded into the base portion of the channel shaped frame 46.

The hinge unit for the upper sash 47 comprises a leg member 53 that is fixedly attached to the side edge of the sash 47. An offset arm 54 is formed at the upper end of the leg member 53 and this arm is pivotally connected to the upper portion of the sliding bar 50, as at 55.

A link 56 is pivotally connected at its upper end to the lower portion of the leg 53, as at 57, while the lower end of this link is pivotally connected to the uppermost screw 52.

The hinge unit that is associated with the in-

termediate sash **48** comprises the leg member **58** that is fixedly secured to the side edge of said intermediate sash. A link **59** is pivotally connected at its upper end to the lower portion of the leg member **58** as indicated at **60**. The lower end of this link has pivoted connection with the intermediate pivot forming screw **52**.

The upper end of the leg member **58** is formed with an offset arm portion **61** and this arm portion is pivotally secured to the upper portion of the adjustably mounted bracket **62** as at **63**. This bracket **62** is adjustable vertically on the bar **50** and is secured thereon by the means indicated generally at **64**.

The upper end of the bracket **62** is formed with a curved edge **65** with which coacts the arcuate flange **66** formed on one side edge portion of the arm **61**.

The hinge unit provided for the lower sash **49** which embodies the delayed opening principle, includes a leg member **67** that is fixedly attached to the side edge of the lower sash. A link **68** is pivotally connected at its upper end to the lower portion of the leg member **67** as at **69**. The lower end of this link has pivotal connection with the lowermost pivot forming screw **52**.

The upper end of the leg member **67** is formed with an offset arm portion **70** and a curved flange **71** extends from one side edge of this arm portion.

A bracket **72** is secured on the actuating bar **50** and is formed with a longitudinal slot **73** to accommodate the pivot pin **74** that extends through the offset arm portion **70**. A laterally extending lug **75** is formed on the lower end of the bracket **72** and is adapted to cooperate with the stop forming flange **76** formed on one side edge of the leg member **67**. The lower end of this flange **76** is formed with a projecting ear **77**.

An automatic locking means designated generally by the numeral **78** is provided for the locking of the upper sash in its fully closed position. This lock is identical with the lock construction employed for securing the upper sash of the wooden frame and sash structure and operates in the same manner as that heretofore described in detail.

For the purpose of locking the lower sash **49** in its fully closed position, I provide an ear portion **78** that is struck out from the lower end portion of the slidable actuating bar **50** and is adapted to have engagement with the laterally extending finger **79** that projects from the lower sash **49**.

The operation of the metal awning type window may be briefly stated as follows. With the parts arranged in the position shown in Figures 11 and 12, all of the vertically swinging sashes are locked in their fully closed position and the actuating bar is in its uppermost position.

By pushing outwardly on the operator associated with the intermediate sash **48**, the hinge units associated with the upper and intermediate sashes will cause the bar **50** to move downwardly. During the downward movement of the bar **50**, the locking means for the top and lower sashes will be released.

The upper and immediate sashes will swing outwardly to a partially open position while the lower sash still remains in its closed position.

Further downward movement of the actuating bar **50** will cause the slotted bracket **72** to move downwardly on the pin **74** until the lug **75** is disposed below the lower edge of the flange **76** and is clear of the ear **77**.

When the parts have reached this position, the curved flange **71** will be clear of the adjacent side edge of the bracket **72** and will be ready to ride over the curved upper end **80** of this bracket, whereupon, further outward movement of the operator sash will cause the lower sash **49** to also swing outwardly to an open position. Thus a delayed opening of the lower sash is effected by this particular hinge construction.

When the sashes are returned to their closed position, the lower sash will assume its fully closed position ahead of the other sashes.

When the sashes are all in their fully closed position, the upward movement of the actuating bar in the meantime will have actuated the automatic locking means provided for the upper and lower sashes.

Means may be provided for holding the metal sashes in any angularly adjusted position similar to that employed in conjunction with the wooden sashes, as set forth in my Patent No. 2,486,407.

It will thus be seen from the foregoing description that I have provided an awning type window that can be readily and easily assembled, installed and operated and due to its simplicity will be inexpensive, yet strong and durable and at all times positive and efficient in its operation.

My improved adjustable hinge construction will insure a tight closing of all of the sashes and further permit the amount of opening of the sashes to be varied.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape, arrangement of parts may be resorted to without departing from the spirit of the invention and the scope of the appended claims.

Having thus described the invention, what I claim is:

1. A window construction comprising a frame, sashes mounted one above another for swinging and tilting movement from a closed position to an outwardly projecting open position, bars slidable vertically at opposite sides of said frame, spaced plate like members secured to the frame, links secured at their upper ends to the respective sashes and at their lower ends being pivotally connected to the respective plate like members, brackets disposed vertically against said bars and having upper and lower portions formed with longitudinally extending slots, screws passing through said slots and adjustably securing the brackets to the bars, said brackets being shiftable vertically to adjusted positions when the screws are loosened, lower ones of the brackets having intermediate portions offset outwardly from the bars and formed with vertical slots having enlarged upper ends, arms extending from the opposite side edges of the upper one of the sashes and being pivoted to the upper brackets, arms extending from the opposite side edges of the lower one of said sashes and carrying pins at their outer ends fitting into the slots in the intermediate portions of the lower brackets through the enlarged upper ends thereof and being slidable longitudinally in said slots and rotatable in the enlarged upper ends thereof, tongues extending from the outer ends of the lower arms adjacent the pins and having free ends bent to form fingers extending towards the lower brackets, and lugs projecting from the offset portions of the lower brackets and being longitudinally arcuate in concentric relation to the enlarged upper ends of the slots and having their outer side edge faces overlapped by the fingers when the bars are

shifted downwardly and the lower sash is swung to an opened position.

2. A window construction comprising a frame, sashes mounted one above another for swinging and tilting movement from a closed position in the frame to an opened position outwardly of the frame, bars slidable vertically at the opposite sides of said frame, spaced plate like members secured to the frame, links secured at their upper ends to the respective sashes and at their lower ends being pivotally connected to the respective plate like members, arms connecting the upper one of the said sashes with said bars for moving the said upper sash to an opened position when the bars are moved downwardly, brackets carried by said bars, each formed with a vertical slot having an enlarged upper end, said brackets being each provided with a lug that is arcuate longitudinally and which extends diagonally of the bracket about a portion of the enlarged upper end of the slot in the bracket, arms extending from the opposite side edges of the lower one of the sashes inwardly of the frame and having free ends overlapping said brackets, each carrying a pin at its outer end fitted into the slot of the companion bracket and slidable longitudinally through its slot, whereby the bars may be moved downwardly the length of the slots to open the said upper sash without opening the lower sash and then to open the lower sash during the continued downward movement of the bars, fingers extending from the outer ends of said arms radially of their pins and formed with elements engageable with the outer side edge faces of the lugs during the opening movement of the lower sash, and companion latch members carried by the bars and the lower sash for securing the lower sash closed when the bars are moved upwardly.

3. A window construction comprising a frame,

sashes mounted one above another for swinging movement from a closed position in the frame to an outwardly inclined opened position, bars slidable vertically at the opposite sides of said frame, spaced plate like members secured to the frame, links secured at their upper ends to the respective sashes and at their lower ends being pivotally connected to the respective plate like members, arms connecting the upper one of said sashes with said bars and opened during the downward movement of the bars, brackets carried by said bars, each formed with a vertical slot and provided with a lug extending partially about the upper end of its slot, arms extending from the side portions of the lower one of said sashes and carrying pins at their outer ends fitting into the slots of said brackets and slidable vertically therein, whereby the bars may be moved downwardly the length of the slots to open the upper sash and upon continued downward movement then open the lower sash, the pins having turning movement in the slots during the opening and closing movement of the lower sash, and fingers extending from outer ends of said arms radially of the pins for movement into engagement with the lugs of said brackets during the turning movement of the pins as the lower sash is opened.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,494,509	Soule	May 20, 1924
1,758,894	Schaffert	May 13, 1930
2,292,133	Larson	Aug. 4, 1942
2,383,912	Garguilo	Aug. 28, 1945
2,486,407	Hoffman	Nov. 1, 1949