Nov. 9, 1954 A. BRENNER 2,693,622

AWNING WINDOW STRUCTURE

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Fig 1

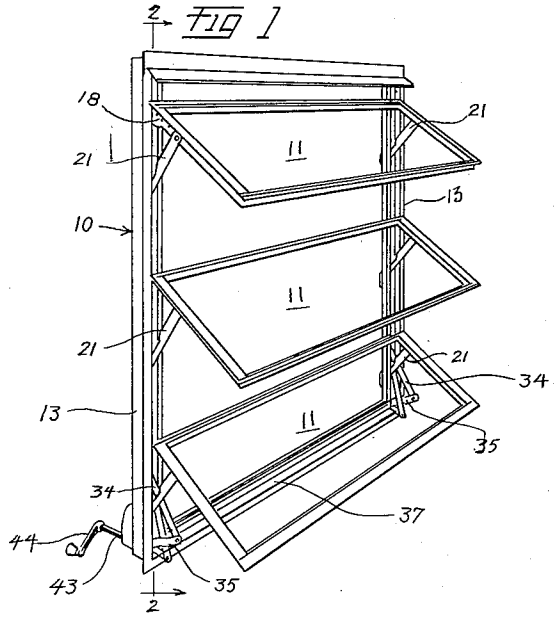


Fig 8

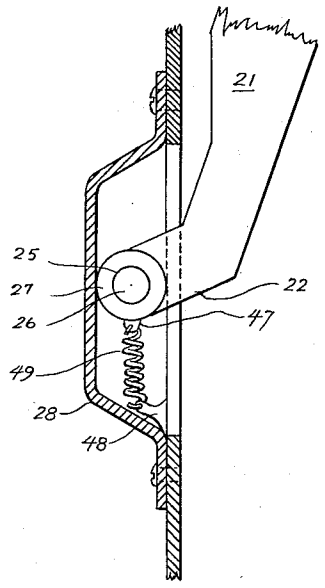


Fig-4

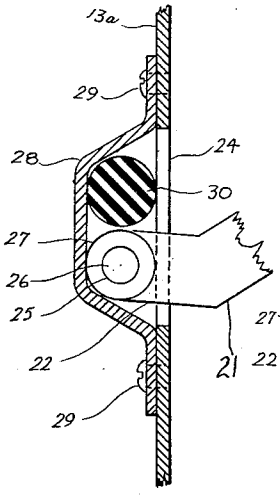


Fig-6

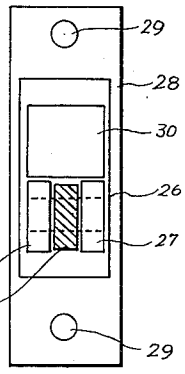


Fig-7

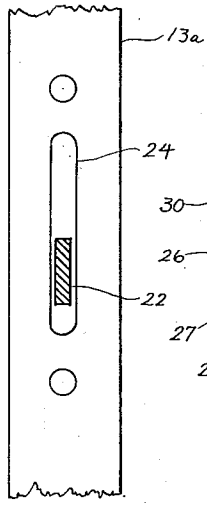
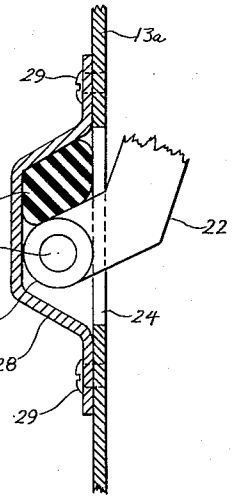


Fig-5



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Fig-3

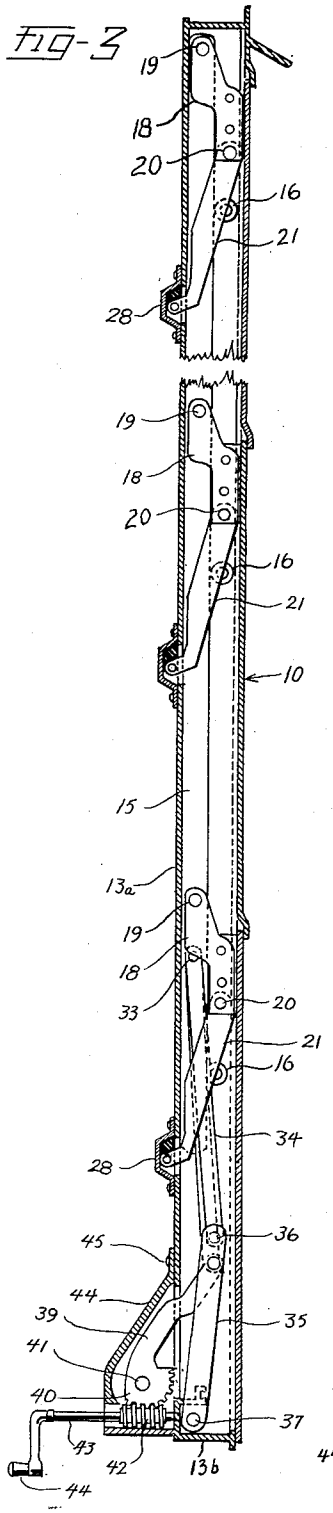
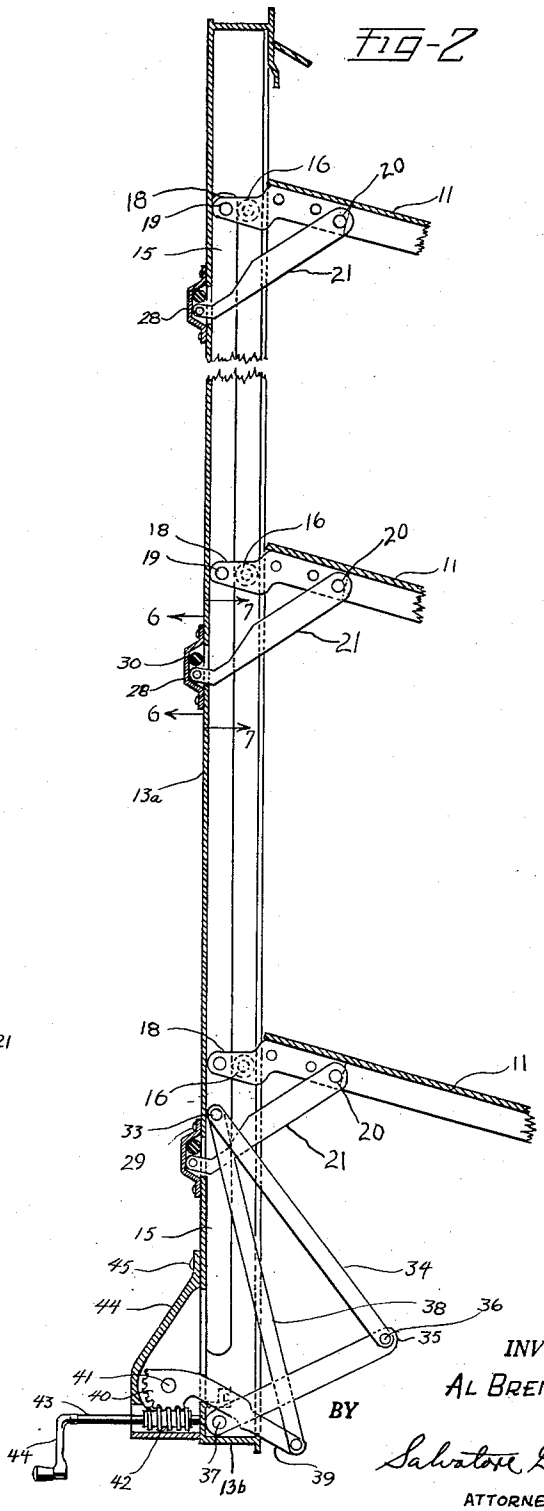


Fig-2



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AWNING WINDOW STRUCTURE

Al Brenner, Miami Beach, Fla.

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8 Claims. (Cl. 20—42)

This invention relates to window structures and is more particularly directed to improvements in awning type windows.

In order that an awning window having a plurality of vents be of optimum efficiency, the vents thereof which close simultaneously, must seal tightly against the frame so that the window may be absolutely air and rain tight. It has been found that within the normal tolerances of manufacture, it was virtually impossible to produce an awning window whose vents close simultaneously to obtain weather tight junctures of the vents in those awning windows having fixed pivots connecting the vents to the window frame. In attempting to solve this important problem, some of the present awning windows are provided with adjustable anchors for connecting the pivots to the vent links attached to the vents. In these windows, the normal procedure is to adjust the anchors upon assembly of the window at the manufacturing plant and then to make any necessary readjustments of the anchors after the awning windows have been installed. However, in spite of all these precautions, it has been found that in many instances some of the vents would fail to close tightly and properly for the following reasons:

1. Failure to make a proper adjustment due to lack of skill of the one making the adjustment or to poor engineering design of the window.

2. Climatic conditions causing constant expanding and contracting of the various parts of the operating mechanisms of the windows.

3. Constant use of the window causing wear of the various operating parts of the awning window.

When the vents of an awning window do not arrive at their closed position simultaneously, after the first vent becomes tightly closed, a further turning of the operating handle of the awning window in attempting to effect a proper closing of those vents still unclosed causes undue strain and wear of the operating mechanism and a consequent buckling of the sliding or actuating bars.

Therefore, it is a principal object of the present invention to provide an awning window with pivot anchoring devices which are self-adjusting so that all of the vents can be brought to their tightly closed positions at all times and without any undue strain on the slide bars and the operating mechanism.

A further object of the present invention is the provision of the above described awning window which is simple in construction and operation, and whose parts are readily replaceable.

A further object of the present invention is the provision of an awning window characterized as above whose anchoring devices are provided with a slidable pivot maintained in position by a resilient member.

A still further object of the present invention is to provide an awning window which when once properly adjusted for simultaneous closing of all vents will need no further adjustment thereof.

With these and other objects in view, the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings, forming a part of the present specification with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings, but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a perspective view of an awning window embodying my invention.

Figure 2 is a sectional view taken along line 2—2 of Figure 1.

Figure 3 is a sectional view similer to Figure 2 with the vents shown in their closed position.

Figure 4 is an enlarged detailed sectional view of the self adjusting anchoring device as positioned when the vent is in its open position.

Figure 5 is a view similar to Figure 4 of the self-adjusting anchoring device as positioned when the vent is in its closed position.

Figure 6 is an enlarged sectional view taken along 6—6 of Figure 2.

Figure 7 is an enlarged sectional view taken along 7—7 of Figure 2.

Figure 8 is a view similar to Figure 5 showing a modification of the self-adjusting anchoring device.

Referring now to the drawings wherein similar numerals are used to designate like parts throughout the several views, and in particular to Figures 1–7 inclusive, the numeral **10** refers generally to an awning window embodying my invention and shown having three vents **11** though any number of vents may be provided in the window as determined by the length or height of window desired. The awning window **10** is provided with a rectangular frame of conventional construction whose vertical side members **13, 13** have a generally U-shaped cross section thereby forming a vertically disposed slot on either side of the window in each of which a slide bar **15** is slidably mounted. A plurality of rollers **16** are mounted within each of the slots on the wall portion of the members **13**; the rollers **16** abutting against the edge portion of the slide members **15** to prevent any sidewise movement thereof.

Each of the vents **11** have a hinge member **18** secured along each side thereof, which member **18** extends beyond the top edge of the vents **11**. The free ends of the hinge members **18** are pivotally mounted to the slide bar **15** by a pivot pin **19** secured thereto. The other end portion of each of the hinge members **18** are provided with a pivot pin **20** upon which is pivotally mounted one end of a vent link **21** whose other end **22** (see Figures 4 and 5) extends through a slot **24** in the rear wall **13***a* of the frame member **13**. The end portion **22** of the vent link **21** is provided with a bore **25** which receives a pin **26** having a roller **27** mounted on the pin **26** on either side of the end portion **22** of the vent link **21**. Since the width of the slot **24** is only slightly larger than the thickness of the end portion **22** of the vent link **21**, the rollers **27** will bear against the outside surface of the back wall **13***a* of the frame **13**. A housing **28** which is secured to the outside surface of the back wall **13***a* by means of screws **29, 29** threaded therein contains the end portion **22** and a resilient member **30** positioned above the rollers **27** in contact relation with the upper portion of the housing **28** and the back wall member **13***a*. The function and operation of the resilient member **30**, which may be made of neoprene, rubber, a compression coil spring and the like, is explained in detail hereinafter.

At the lower portion of each of the slide bars **15** there is secured a pin **33** on which one end of a link **34** is pivotally mounted. The other end of each of the links **34** is pivotally mounted to one end of a cross shaft arm **35** as at **36** while the other end of each of the cross shaft arms **35** is secured to the end portions of a cross shaft **37** which is housed in the sill or lower horizontal frame member **13***b*. The pin **33** of one of the slide bars **15** has a power link **38** pivotally mounted thereon; the other end of the power link **38** being pivotally mounted to one end of a power arm **39** whose other end is provided with a segment gear **40** and is pivotally mounted to the frame **13** as at **41**. The segment gear **40** is in mesh engagement with a worm gear **42** mounted on a shaft **43** to which an operating handle **44** is secured. An operator housing **44** which contains the aforementioned gearing mechanism is secured by screws **45** to the frame **13**.

As is readily noted upon the actuation of the operating

handle 44 to open the vent 11, the revolving worm gear 42 causes the outward pivotal movement of the power arm 39, the downward sweeping of the link 34 and a downward sliding movement of the slide bar 15. Simultaneously, the power link 34 swings downwardly and outwardly causing the cross shaft 37 to rotate through the medium of the cross shaft arm 35 which is pivotally connected to the link 34. The rotation of the cross shaft 37 effects the swinging of the cross shaft arm 35 at the other side of the window 10 which in turn causes the other link 34 to swing outwardly and downwardly thus compelling the other slide bar 15 to move downwardly in synchronism with the first mentioned slide bar 15. The downward movement of the pair of slide bars 15 causes the pins 19 and free ends of the hinges 18 to move downwardly and thereby compel the vents 11 to swing about the pivot pin 20 to their open position.

By reversing the operation of the operating handle 44, the gear mechanism and the linkages will cause the slide bars to slide upwardly and the vents will return to their closed positions. Due to the tolerances permitted or even possible in the manufacture of awning windows, the pivot pins 19 on the slide bars 15 and the pivot pins 26 on the frame 13 will not be precisely positioned to effect the perfect and uniform closing of each of the vents 11. Now, when a vent 11 closes before the other vents are in a closed position, a further actuation of the operator handle 44 will cause a continued upward movement of the slide bars 15 and the vent or vents that have first arrived at their closed position will cause a slight upward movement of the vent link 21 and of the rollers 27 thereby exerting a compressive pressure against the resilient member 30. When all of the vents 11 are in their closed position, the resilient members 30 will be distorted in direct proportion in the order in which the particular vent to which they are attached become closed; the last vent that closed causing its resilient member 30 to be distorted the least amount. It can be seen that within certain limits, the failure of all the vents 11 to close simultaneously will not prevent the proper closing of all the vents 11; this closing of the vents 11 will not cause any undue strain of the operating mechanism or a buckling of the slide bars 15.

Referring now to Figure 8 wherein a modification of my invention is shown, the lower portion of the free end 22 of the vent link 21 is provided with a lug 47. A second lug 48 is secured to the outside surface of the frame 13*a*. A coil spring 49, which has its end portions engaging bores in the lugs 47 and 48, yieldingly urges the free end 22 and the rollers 27 to their lowermost position as does the resilient member 30 shown in Figures 4 and 5 and previously discussed. As the vents 11 are brought to their closed position, the upward movement of the vent link 21 will cause the upward sliding movement of the free end 22 against the yielding force of the coil spring 49. When the vents are brought to their open position, the coil springs 49 will return the free end 22 of the vent link 21 to its lowermost or normal position in the housing 28.

Having described my invention, what I claim as new is:

1. An awning window construction comprising a sash mounted on said frame, a slide bar slidably mounted on said frame, a hinge member secured at one end to said sash and having its other end pivotally mounted on said slide bar, a sash link, pivot means mounting one end of said sash link to said sash, pivot means slidably mounting the other end of said sash link to said frame, resilient means engaging said other end of said sash link and exerting a yielding force thereon, and means for actuating said slide bar for opening and closing said sash.

2. An awning window construction comprising in combination, a frame, a plurality of sashes mounted in a tier on said frame, a slide bar slidably mounted on said frame adjacent said sashes, a hinge member having one end secured to each of said sashes, pivot means securing the other end of said hinge members to said slide bar, a sash link pivotally mounted at one end to each of said sashes, pivot means slidably mounting the other end of such of said sash links to said frame, resilient means engaging said other end of each of said sash links and exerting a yielding force thereon, and actuating means operatively connected to said slide bar for opening and closing said sashes.

3. An awning window construction comprising a frame, a sash mounted on said frame, an actuating bar slidably mounted on said frame, a hinge member secured at one end to said sash and having its other end pivotally mounted on said actuating bar, a sash link, pivot means mounting one end of said sash link to said sash, further pivot means mounting said other end of said sash link to said frame, resilient means cooperatively engaging said frame and said further pivot means whereby upon the closing of said sash, said other pivot means is adapted to move along said frame, and actuating means operatively connected to said slide bar for opening and closing said sash.

4. An awning window construction comprising in combination a frame, a plurality of sashes mounted in a tier on said frame, a slide bar slidably mounted on said frame adjacent said sashes, a hinge member having one end secured to each of said sashes and the other end pivotally mounted on said slide bar, a sash link pivotally mounted at one end to each of said sashes, pivot means mounting the other end of said sash links to said frame, resilient means cooperatively engaging said frame and said pivot means permitting said pivot means to move along said frame, and actuating means connected to said slide bar for opening and closing said sashes.

5. In an awning window construction having a frame and a plurality of sashes mounted in a tier on said frame, the combination of a slide bar slidably mounted on said frame adjacent said sashes, a hinge member having one end secured to each of said sashes and the other end pivotally mounted on said slide bar, a slot in said frame adjacent each of said sashes, a sash link pivotally mounted at one end to each of said sashes, the other end of each of said sash links passing through said slots in said frame, a pivot pin mounted on each of said other end of said sash links, a roller rotatably mounted on said pin and engaging said frame, a resilient member mounted in contact relation with each of said rollers and said frame, a housing containing each of said rollers and said resilient members whereby upon the closing of said sashes said rollers and said pivot pins are permitted to move along said frame, and actuating means connected to said slide bar for opening and closing said sashes.

6. In an awning window construction having a frame and a plurality of sashes mounted in a tier on said frame, the combination of a slide bar slidably mounted on said frame adjacent each side of said sashes, a hinge member secured at one end to the side portions of each of said sashes and having their other ends pivotally mounted to each of said slide bars, a slot in said frame adjacent each of said sashes, a sash link pivotally mounted at one end to the sides of each of said sashes and having their other ends passing through said slots in said frame, a pivot pin mounted on each of said other end of said sash links and extending on either side thereof, a roller rotatably mounted on each of said pivot pins on both sides of said sash links, a housing mounted on said frame and containing each of said rollers and said pivot pins, a chamber contained within said housings above said rollers and said pivot pins to provide a path of movement for said pivot pins, a resilient member contained in each of said housings and engaging said other end of each of said sash links and exerting a downward yielding force thereon, and operating means cooperatively connected to said slide bars for opening and closing said sashes simultaneously.

7. The structure as recited by claim 6 wherein said resilient members are contained in said housing in said chamber in contact relation with said housing and said rollers.

8. In an awning window construction having a frame and a plurality of sashes mounted in a tier on said frame, the combination of a slide bar slidably mounted on said frame adjacent each side of said sashes, a hinge member secured at one end to the side portions of each of said sashes and having their other ends pivotally mounted to each of said slide bars, an elongated slot contained on the sides of said frame adjacent each of said sashes, a sash link pivotally mounted at one end to the sides of each of said sashes and having their other ends passing

through said slots in said frame, a pivot pin mounted on each of said other end of said sash links and extending beyond either side thereof, a roller rotatably mounted on each of said pivot pins on both sides of said sash links, spring means yieldingly securing the lower portion of said other end of said sash links and said frame thereby permitting an upward movement thereof and operating means connected to said slide bars for opening and closing said sashes simultaneously.

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