

May 22, 1934.

E. F. WILEY

1,959,941

AWNING TYPE WINDOW

Filed March 28, 1933

3 Sheets-Sheet 1

Fig. 2.

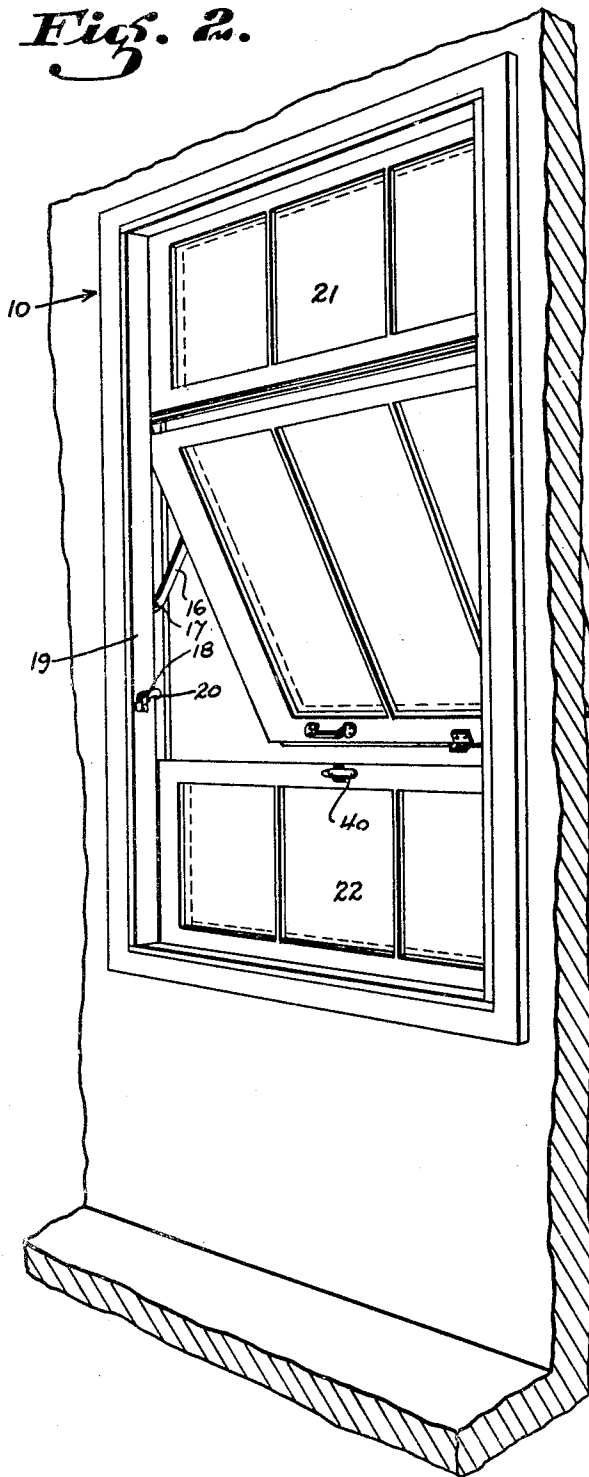


Fig. 1.

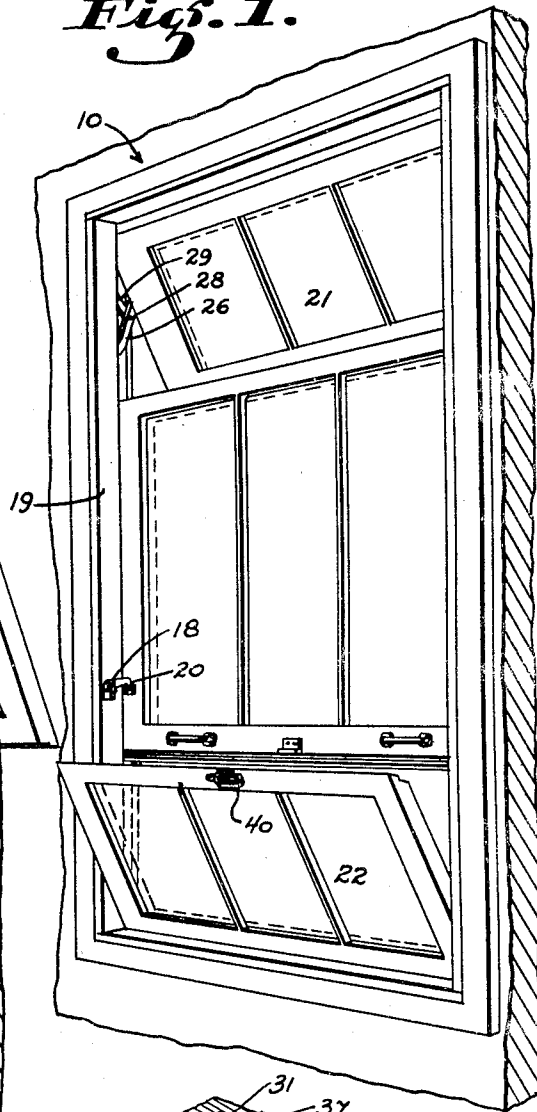
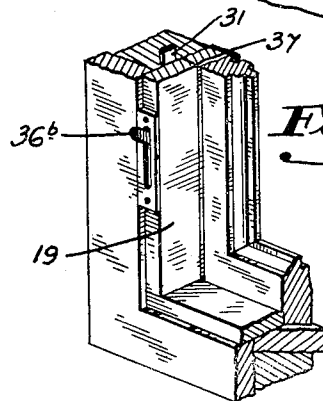


Fig. 10.

INVENTOR.
Esmond F. Wiley.

BY

Townsend and Loftus.
ATTORNEYS.

May 22, 1934.

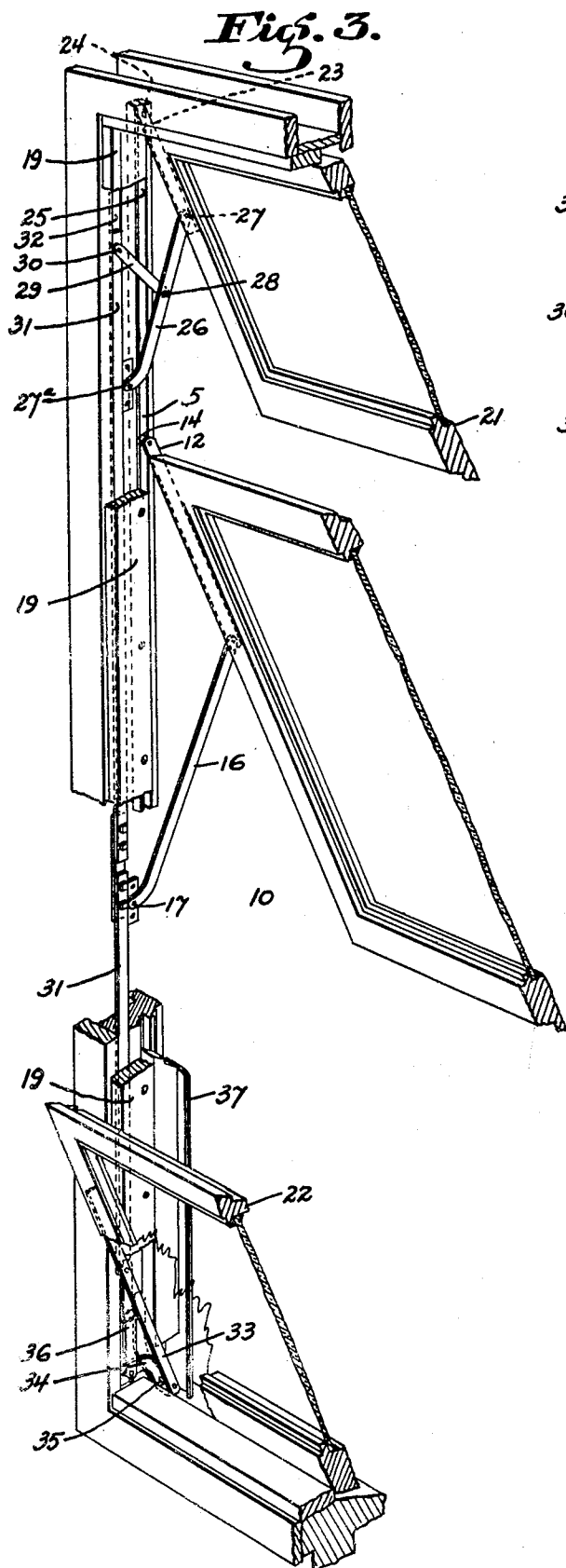
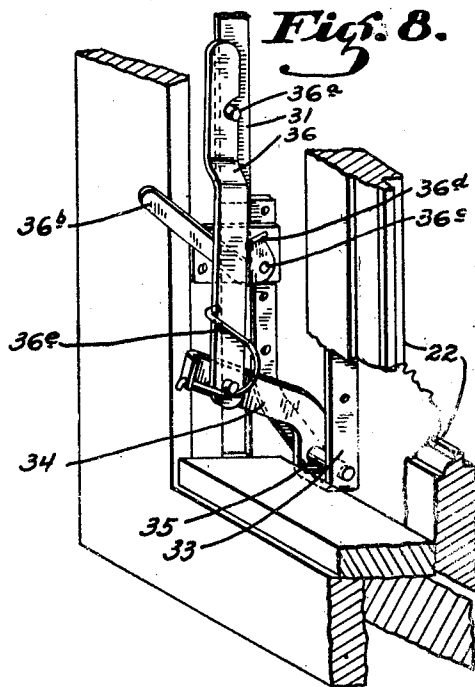
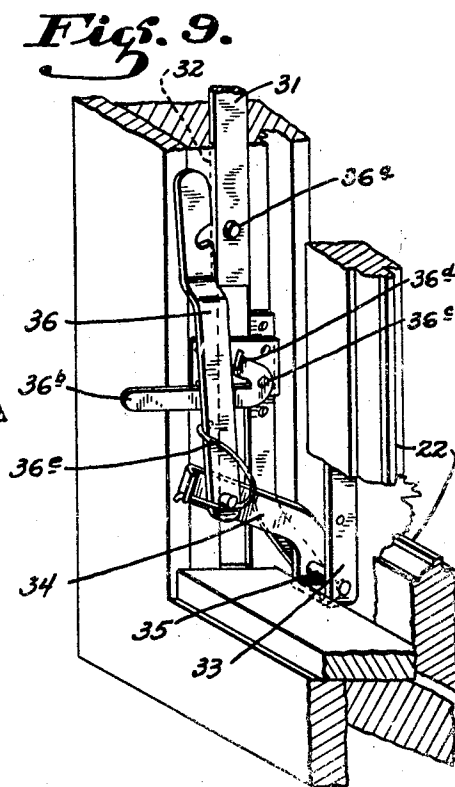
E. F. WILEY

1,959,941

AWNING TYPE WINDOW

Filed March 28, 1933

3 Sheets-Sheet 2



INVENTOR.
Edmond F. Wiley.

BY *Townsend & Loftis.*
ATTORNEYS.

May 22, 1934.

E. F. WILEY

1,959,941

AWNING TYPE WINDOW

Filed March 28, 1933

3 Sheets-Sheet 3

Fig. 4.

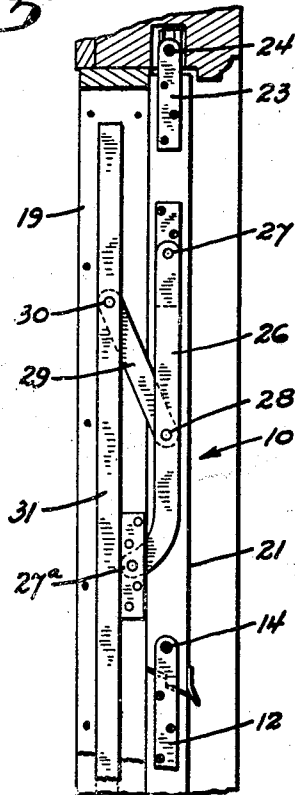


Fig. 5.

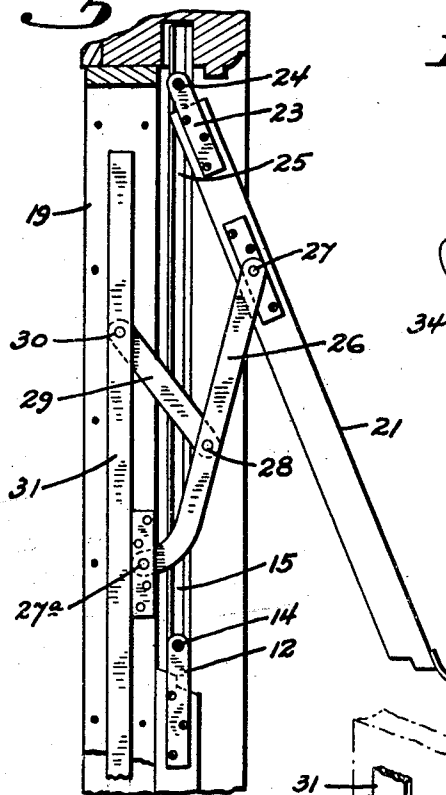


Fig. 7.

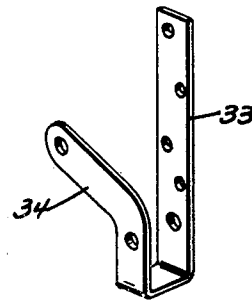
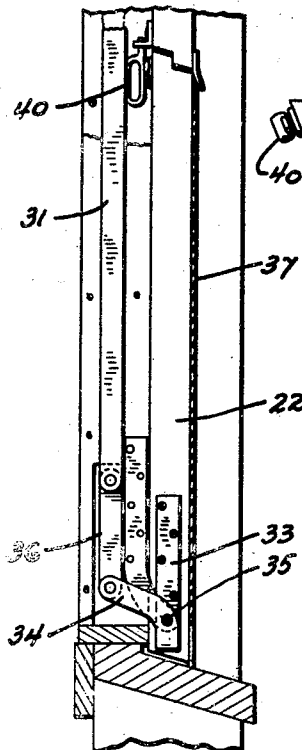
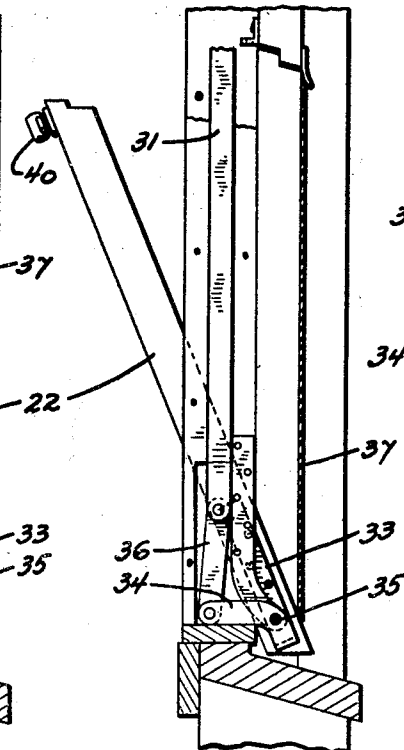
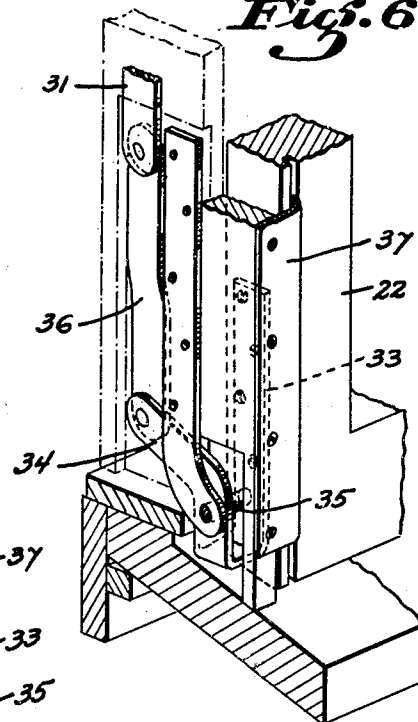


Fig. 6.



INVENTOR.
Edmond F. Wiley.

BY *Townsend & Loftis*
ATTORNEYS.

UNITED STATES PATENT OFFICE

1,959,941

AWNING TYPE WINDOW

Esmond F. Wiley, Oakland, Calif., assignor to
Universal Window Company, Berkeley, Calif., a
corporation of California

Application March 28, 1933, Serial No. 663,106

11 Claims. (Cl. 20-42)

This invention relates to windows of the type wherein the sash swing in a vertical plane.

In prior windows of this type, which are commonly termed "awning type windows", all of the sash swing outwardly. This type of window construction has several disadvantageous features among which is that when the sash are extended, they act to deflect street noises or sounds arising at the exterior of the building into the room. Further, wind blowing against the extended sash tends to move the sash to closed position and when a fairly strong wind or a draft is created through the room, it is next to impossible to maintain the sash in open position. Another disadvantage of these prior windows is that when the sash are extended, improper ventilation results due to the fact that the breeze or draft enters directly through the open lower portion of the window.

It is the principal object of the present invention to provide an improved window employing swinging sash, in which window the disadvantageous features inherent in awning type windows hitherto produced are eliminated.

I accomplish this object by providing a window fitted with three swinging sash which swing in a vertical plane. The upper and lower sash are so mounted and connected together that when they are moved to open position, the lower rail of the upper sash moves outwardly and the upper rail of the lower sash moves inwardly. This eliminates a direct draft through the open lower portion of the window and results in proper ventilation of the room. In other words, the lower sash operates as a deflector to deflect both sound and air, resulting in perfect ventilation of the room and muffling of the street noises arising at the exterior of the building. Further, any wind blowing against the open sash is rendered ineffective in operating the sash for the reason that it tends to open the lower sash and close the upper one. As these two are connected together, equalization results and the sash will maintain their respective adjusted positions. The window is provided with an intermediate sash between the upper and lower ones, which operates independently. This intermediate sash is ordinarily moved to open position only during extremely warm weather or for cleaning purposes. In the normal use of the window the intermediate sash is maintained in closed position and ventilation is controlled solely by means of the upper and lower sash.

One form which the invention may assume is exemplified in the following description and il-

lustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a perspective view of my improved window disclosing the upper and lower sash in open position such as they assume during the normal use of the window.

Fig. 2 is a similar view showing the upper and lower sash in closed position and the intermediate sash in open position.

Fig. 3 is a perspective view of the window frame with all three sash in open position and with parts of the frame and sash broken away to clearly disclose the operating mechanism thereof.

Fig. 4 is a vertical sectional view taken through the window frame at one side thereof so as to disclose the side rails of the upper and lower sash in full and the operating mechanism connected therewith.

Fig. 5 is a similar view of the upper and lower sash moved to open position.

Fig. 6 is an enlarged fragmentary view in perspective showing the pivotal mounting of the lower sash and the manner in which it is connected to the travelling bar.

Fig. 7 is a perspective view of the bracket and crank arm mounted on the side rails of the lower sash.

Figs. 8, 9 and 10 are perspective views showing the mechanism which I employ if it is desired to so connect the upper and lower sash that under certain conditions the same may be independently operated.

Referring more particularly to the accompanying drawings, 10 indicates a window which is particularly suited for use in schools, public buildings and in office buildings, although I am aware that the same may be used in other types of structures. This window comprises an open rectangular frame mounted within which are three sash, all of which swing in a vertical plane. I intend that under normal circumstances that the upper and lower sash operate in unison. As illustrated in the drawings, the upper sash opens outwardly while the lower sash opens inwardly. That is, when the center sash is in closed position, a perfect ventilation action is obtained. It will be noted that when the upper and lower sash are moved to open position that the lower rail of the upper sash moves outwardly while the upper rail of the lower sash moves inwardly. Therefore, the lower sash will act to deflect entering air upwardly and prevent a direct draft through the open lower portion of the window. Likewise, it will act to muffle any street noises or other sounds arising exteriorly of the building.

In the normal operation of the window it is merely necessary to operate the upper and lower sash, the intermediate sash being operative so that it may be opened and closed only for use in extremely warm weather or for the purpose of cleaning it.

The intermediate sash is pivotally and slidably mounted in the frame so that its lower end may be swung outwardly. Reference being had to the accompanying drawings, it will be seen that the side rails of the intermediate sash are each provided with a strap 12 which project slightly above the upper rail of the sash. These projecting ends are provided with laterally projecting pins 14 which are engaged in trackways 15 formed in the jambs of the frame and extending vertically thereof. At each side of the window a fulcrum link 16 is provided which is connected at its uppermost end to the side rail of the sash intermediate the ends thereof. The lower end of the fulcrum link is pivotally connected to the adjacent jamb as at 17. This mounting of the intermediate sash is such that by exerting a push or pull on the lower rail thereof, the same may be moved to open and to closed position.

To latch this sash in closed position, I have provided a latch mechanism 18 at each side of the frame, which latch mechanisms include a gravity operated keeper pivotally mounted on the stop 19 of the frame and a latch member 20 on the side rail of the intermediate sash. When the intermediate sash is moved to closed position, the keepers 18 automatically drop into latching position over the latch members 20 and effectively latch the intermediate sash in closed position. When it is desired to open the intermediate sash, it is only necessary to disengage the keepers 18 and exert a push on the lower rail of the sash.

Reference being had to the drawings, it will be seen that the upper and lower sash 21 and 22 are equal in area and are less in vertical dimensions than the intermediate sash.

As previously stated, it is desired that the upper sash open outwardly. That is to say, when it is moved to open position, its upper rail remains within the frame while its lower rail extends, the sash assuming an oblique position relative to the frame. At each side the upper sash is provided with a strap 23, the ends of which project beyond the upper rail of the upper sash. These straps 23 are securely fastened to the side rails of the sash. The upwardly projecting ends of the straps 23 are each provided with laterally extending pins 24 which engage vertical tracks 25 formed in the adjacent jambs of the frame. This provides a pivotal and slidable connection between the upper end of the sash and the jamb so that the lower end of the sash may swing in a vertical plane.

To complete the connection between the upper sash and the frame, fulcrum links 26 are provided which are arranged one at each side of the sash intermediate the side rails thereof and the jambs. The upper ends of these fulcrum links 26 are pivotally connected at their upper ends as at 27 to the side rails of the sash while the lower ends of these fulcrum links 26 are pivotally connected to the jambs as at 27a beneath the stops 19.

It will be noticed that intermediate the ends of each fulcrum bar 26 it is provided with a laterally projecting pin 28 which detachably engages the lower end of a connecting link 29. The upper end of this link is pivotally connected as at 30 to a travelling bar 31 which is reciprocally mounted

in a groove 32 formed vertically in the jamb beneath the stop. The travelling bars 31 are arranged one at each side of the frame, both sides of the frame being identical in construction.

It is seen, therefore, that the link 29 forms a connection between the fulcrum arm 26 and the adjacent travelling bar 31 so that when the travelling bar 31 is vertically reciprocated, the upper sash 21 will be swung inwardly and outwardly depending upon the direction of movement of the travelling bar.

In order that the upper sash may be disconnected from the travelling bar so that it may be reversed for cleaning, the lower end of the link 29 is detachably connected with the pin 28 of the fulcrum link 26, as previously described. The link 29 is of material having inherent spring qualities and it is so bent during the construction of the window that it will normally tend to maintain its connection with the pin 28. However, by exerting inward pressure on the lower ends of these links 29, they may be disconnected from the pins 28 of the fulcrum arms 26 and the upper sash reversed for cleaning purposes.

It is desired to call attention to Fig. 3 of the drawings which clearly illustrates that the travelling bars are of considerable length and provided with an intermediate adjustment for the purpose which will be hereinafter described.

The lower sash 22 is pivotally mounted at its lower end in order that its upper end may be opened inwardly. The upper and lower sash are so connected with the travelling bars 31 that they will operate in unison and in opposition to each other. That is to say, when the upper edge of the lower sash is swung inwardly, the lower edge of the upper sash will swing outwardly and vice versa. To accomplish this the side rails of the lower sash are each fitted with a bracket 33 which has a flat portion securely fastened to the outer surface of the side rail of the sash. At its lower end this bracket is laterally offset and then extending rearwardly to provide a crank arm 34. The lateral offset in the bracket 33 enables this crank arm to be positioned in a proper plane relative to the adjacent travelling bar 31 and behind the stop 19. At its lower end this bracket 33 is pivotally connected by a pin 35 to the adjacent jamb. The bracket 33 is most clearly illustrated in Figs. 3, 6 and 7.

To connect the lower sash to the travelling bar so that reciprocation of the latter will operate both the upper and lower sash in unison, the inner end of each crank arm 34 is pivotally connected to the lower end of a connecting rod 36. The upper end of this connecting rod in the form of the invention shown in Figs. 1 to 7, inclusive, is pivotally connected to the lower end of the adjacent travelling bar 31 so that swinging movement of the upper end of the lower sash will be accompanied by reciprocation of the travelling bar 31 and, as previously described, will result in swinging movement of the upper sash.

The travelling bars are provided with an intermediate adjustment, as previously mentioned, in order to insure that when the lower sash is moved to closed position that the upper sash will likewise be tightly closed.

It will be noticed also from the drawings that the travelling bar, the connecting rods 36 and the inner end of the crank arms 34 will be concealed beneath the stop arranged over the jambs at the interior side of the window.

It should be stated that the side rails of the lower sash are cut-away vertically to accommo-

date this stop and to enable the lower sash to be moved inwardly. However, the light openings in the lower sash equal in every respect the light openings in the upper sash and from the interior of the window, the side rails of the upper and lower sash when the same are in closed position will have exactly the same appearance.

In order to provide a weather-proof joint at the exterior of the lower sash and at the side rails thereof, a filler strip 37 is arranged on each jamb in alignment with the side rails of the lower sash when the latter is in closed position. These filler strips are securely fastened to the jambs and are complementary to the side rails of the lower sash so that when the lower sash is in closed position, these filler strips take the place of that cut-away portion of the side rails of the lower sash. The upper end of the filler strips 37 are cut in conformity with the upper or meeting rail of the lower sash so as to provide a weather-proof joint between the meeting rails of the intermediate and lower sash.

To provide a weather-proof joint between the adjacent surfaces of the filler strips 37 and the side rails of the lower sash, I have provided a weather strip at each side of the frame at the exterior thereof. This weather strip may be formed of any suitable sheet metal and extends from the lower to the upper end of the filler strips and is fastened over the exterior surface thereof. The inner edges of these weather strips project laterally inwardly beyond the inner surface of the weather strips and are intumed as illustrated so as to project within vertical grooves formed in the exterior surface of the side rails of the lower sash. The provision of these weather strips prevents the ingress of water between the fillers 37 and the adjacent surfaces of the side rails of the lower sash.

In operation of the window illustrated in Figs. 1 to 7, inclusive, the intermediate sash is normally maintained in closed position. Ordinarily this sash is not open except in extremely warm weather or when it is desired to reverse the same for cleansing. In normal operation of the window all of the ventilation is obtained by operation of the upper and lower sash.

When it is desired to open the window, a pull is exerted on the upper rail of the lower sash through the medium of a casement fastener 40 arranged at the center thereof. This casement fastener also acts to latch the upper and lower sash in closed position and for this purpose complementary portions of the casement fastener are mounted on the meeting rails of the intermediate and lower sash.

When an inward pull is exerted on the upper rail of the lower sash, the upper end of the lower sash will move inwardly into the room as the lower sash will pivot about the pivot pins 35 engaged with the brackets 33 at the lower sides of the lower sash 22 and with the jambs of the frame. This pivotal movement of the sash causes downward swinging movement of the crank arms 34 formed as a part of the brackets 33. This swinging movement of these crank arms 34 will be translated into downward movement of the travelling bars 31 through the medium of the connecting rods 36, the connecting rods being pivotally connected both to the travelling bar and to the crank arms 34 to accommodate the arcuate movement of the outer end of the connecting rods 36.

As the travelling bars move downwardly, they will impart a swinging movement to the fulcrum

arms 26 of the upper sash, swinging the upper ends of these fulcrum arms outwardly and causing outward swinging movement of the lower end of the upper sash to the same degree as the inward swinging movement of the lower sash.

It is obvious that any wind blowing against the upper and lower sash will exert equal pressure on both thereof and as the wind pressure on the lower sash will seek to open the same, this will oppose the pressure on the upper sash seeking to close the same. Consequently, the effect of the wind will be equalized and the position of the sash will be affected thereby.

It will also be noticed that the position of the lower sash will deflect any direct drafts through the lower open portion of the window, deflecting the same upwardly. This is an ideal condition for proper ventilation. Also, the position of the lower sash will tend to deflect any street sounds or other noises arising at the exterior of the building and will muffle the same.

When the lower sash is moved to closed position, the inner ends of the crank arms 34 will swing upwardly and impart upward movement to the travelling bars 31 through the connecting rods 36. This upward movement of the travelling bars 31 will, through the medium of the connecting links 29, swing the fulcrum links 26 of the upper sash inwardly, consequently moving the upper sash to closed position. In this closed position the lower sash may be latched to the intermediate sash through the medium of the casement fastener.

If it is desired to clean the upper sash, the lower ends of the connecting links 29 may be detached from the fulcrum arms 26, as described, so as to disconnect the upper sash from the travelling bar. The upper sash may then be reversed, if desired, to clean the exterior thereof.

To open the intermediate sash the latch members at the opposite sides thereof, indicated by the numeral 20, are released and the casement fastener 40 is released. The lower end of the sash is then moved outwardly as in the case of the ordinary type of awning window.

In Figs. 8, 9 and 10, I have shown a modified form of the invention which enables the lower sash under certain circumstances to be operated independently of the upper sash. In the construction illustrated in Figs. 8 to 10, inclusive, the upper end of the connecting rods 36 are slotted to engage pins 36a on the travelling bars, so that the upper end of the connecting rods may be disconnected from the travelling bars. Reference being had to these figures it will be seen that I have provided an operating lever 36b at each side of the frame and beneath the stop. These operating levers are pivoted to the jamb as at 36c beneath the stop and each is provided with an intumed end 36d which engages the outer edge of the connecting rod 36 intermediate the ends thereof. When these operating levers 36b are pressed downwardly to the position illustrated in Fig. 9, the intumed ends 36d thereof act to move the upper ends of the connecting rods 36 to a position detaching them from the pins 36a and, consequently, enable the lower sash to be operated independently of the upper one.

For example, in the event it is desired to open the lower sash independently of the upper one, the levers 36b are pressed downwardly to the position shown in Fig. 9, detaching the connecting rods 36 from the travelling bars 31. The lower sash may then be moved to open position without affecting the position of the upper sash. Im-

mediately, however, the lower sash commences to be moved to closed position, the movement of the connecting rods 36 releases the levers 36b. The connecting rods 36 are then urged into engagement with the pins 36a by means of springs 36e, one of which being provided for each connecting rod. Therefore, when the lower sash is moved to closed position, the slots in the upper ends of the connecting rods 36 register with the pins 36a and a connection is automatically effected between the connecting rods 36 and the travelling bars 31 without further manipulation of the levers.

Likewise, when the upper and lower sash are in open position, the lower sash may be closed independently of the upper sash by merely depressing the levers 36b which will disengage the connecting rods 36 from the travelling bars 31. Immediately the lower sash commences to move toward closed position, the connecting rods 36 will release the operating levers 36b due to the upward movement of these connecting rods and their action against the inturned ends of the levers 36b.

When it is desired to close the upper sash, the lower sash is moved to open position and the moment the slots in the connecting rods 36 register with the pins 36a of the travelling bars 31, the springs 36e will act and a connection will be formed between the connecting rods 36 and the travelling bars 31 and thereafter the lower and the upper sash will operate in unison.

From the foregoing it is obvious that the window which I have provided eliminates the disadvantages inherent in the ordinary awning type window. That is to say, first, perfect ventilation will be obtained. Secondly, street noises will be muffled and, thirdly, any wind blowing will have no effect in operating the windows.

It is also manifest that the operating mechanism is comparatively simple and will not readily become out of order and while I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a window structure, a frame, a sash mounted for inward swinging movement relative to the frame, a second sash mounted for outward swinging movement relative to the frame, a travelling bar slidably mounted on the frame, and connections between each of said sash and the sliding bar whereby swinging movement of one sash will impart swinging movement to the other sash.

2. In a window structure, a frame, a sash mounted for inward swinging movement relative to the frame, a second sash mounted for outward swinging movement relative to the frame, a travelling bar slidably mounted on the frame, connections between each of said sash and the sliding bar whereby swinging movement of one sash will impart swinging movement to the other sash, said connections between one sash and said sliding bar being detachable whereby the other sash may be swung relative to the frame independently.

3. In a window structure comprising a frame and a pair of sash mounted for swinging movement therein, one of said sash being mounted for inward swinging movement relative to the frame and the other sash being mounted for outward swinging movement relative to the frame, a

travelling bar slidably in the frame, connections between one sash and the travelling bar whereby swinging said sash will cause the bar to slide, and a link carried by said travelling bar and pivoted relative to the other sash whereby sliding movement of the bar will cause the said other sash to swing, said link being resilient whereby it may be sprung to a position releasing its pivotal connection with the sash to permit the sash to be swung independently of each other.

4. In combination with a window frame having an inward swinging sash and an outward swinging sash, a travelling bar slidably mounted in the frame, a bracket fixed to one of said sash, a pivotal connection between said bracket and the frame to permit swinging movement of the sash, said bracket being extended to form a crank arm, and a connection between said crank arm and travelling bar whereby swinging of the sash will slide the travelling bar.

5. In a window frame having upper and lower swinging sash, the upper sash swinging outwardly relative to the frame and the lower sash swinging inwardly relative to the frame, a travelling bar slidably in the frame, connections between said bar and sash whereby swinging of the lower sash will impart swinging movement to the upper sash, said connections between the lower sash and said bar comprising a crank arm fixed to the bottom of the sash, and a connecting rod pivoted to the crank arm and to the travelling bar.

6. In a window comprising a frame, an upper outwardly swinging sash, an intermediate outwardly swinging sash and a lower inwardly swinging sash in said frame, connections between the said upper and lower sash whereby swinging of one will be accompanied by swinging of the other, and latch means for connecting the upper rail of the lower sash and lower rail of the intermediate sash to prevent swinging movement of all of said sash.

7. In a window structure, a frame, a lower sash mounted for inward swinging movement relative to the frame, an upper sash mounted for outward swinging movement, a slidably and pivotable connection between the upper sash and the frame whereby the upper sash may be reversed in the frame to permit cleaning of its outer side from the inside of the frame, connections between said sash whereby swinging movement of one sash will impart swinging movement to the other, and means for detaching said connections when said upper sash is to be reversed in the frame.

8. In combination with a window frame, sash mounted for outward swinging movement therein, a sash mounted for inward swinging movement in the frame, and a pair of stop members extending throughout the length of the frame against which said outwardly swinging sash abut when closed, said inwardly swinging sash having its sides cut-away to clear said stop members when the sash is opened.

9. In combination with a window frame, sash mounted for outward swinging movement therein, a sash mounted for inward swinging movement in the frame, a pair of stop members extending throughout the length of the frame against which said outwardly swinging sash abut when closed, said inwardly swinging sash having its sides cut-away to clear said stop members when the sash is opened, and filler members between the cut-away sides of said sash and the frame.

10. In combination with a window frame having outwardly swinging sash and an inwardly swinging sash, stop members against which the

outwardly swinging sash abut when closed, the sides of said inwardly swinging sash being cut-away to clear said stop members, weather strips fixed relative to the frame and overlying the edges of said inwardly swinging sash, said sash having grooves formed in its outer surface, and flanged edges on said weather strips lying within said grooves when the sash is closed.

11. In a window frame having upper and lower swinging sash, the upper sash swinging outwardly and the lower sash swinging inwardly, a travelling bar slidable in the frame, connections between

said bar and sash whereby swinging of the lower sash will impart swinging movement to the upper sash, said connections between the lower sash and said bar comprising a crank arm fixed to the sash, a connecting rod pivoted to said crank arm, a pin in said travelling bar and a notch in the connecting rod positioned to receive said pin, means normally urging the connecting rod into position of engagement of said notch and pin, and means for moving the connecting rod away from said position.

ESMOND F. WILEY.

15	90
20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150