May 3, 1955 M. D. ORLIN 2,707,311

WINDOW CONSTRUCTION

Filed June 12, 1953 3 Sheets-Sheet 1

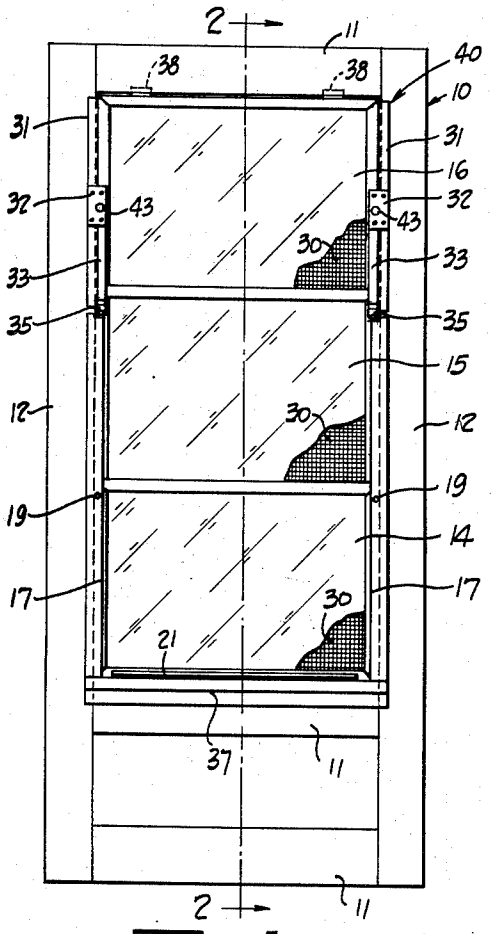


FIG. 1

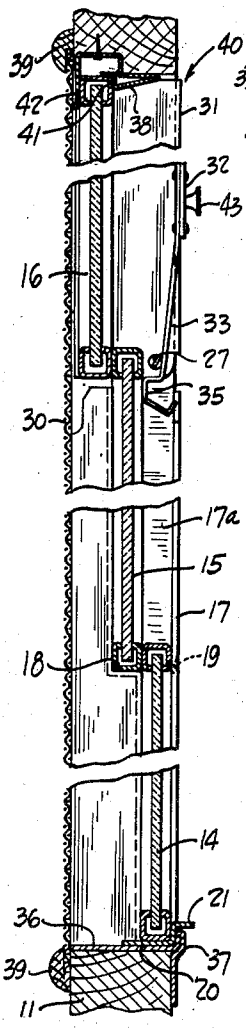


FIG. 2

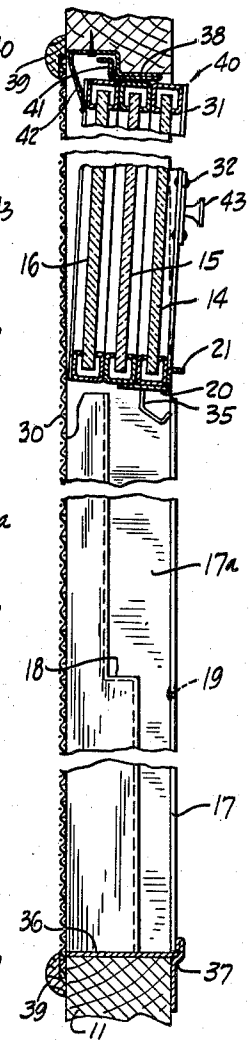


FIG. 3

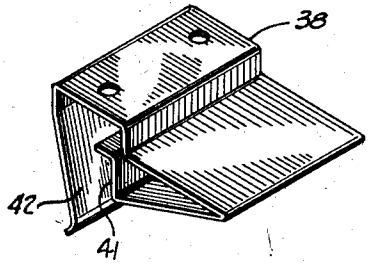


FIG. 8

INVENTOR.
MORRIS D. ORLIN
BY Sanford Schwarmacher
ATTORNEY

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WINDOW CONSTRUCTION

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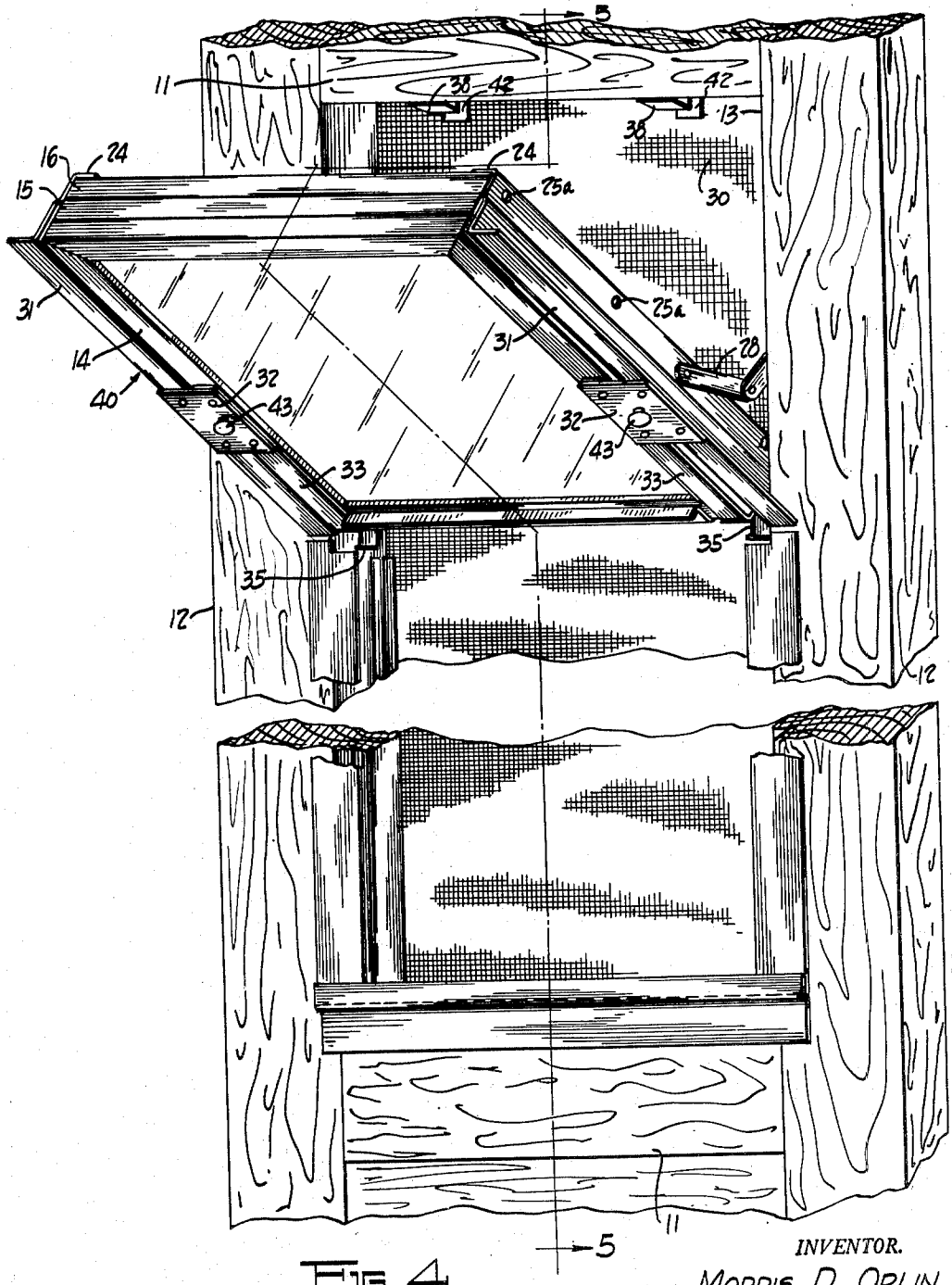


FIG. 4

INVENTOR.
MORRIS D. ORLIN
BY Sanford Schwarmacher
ATTORNEY

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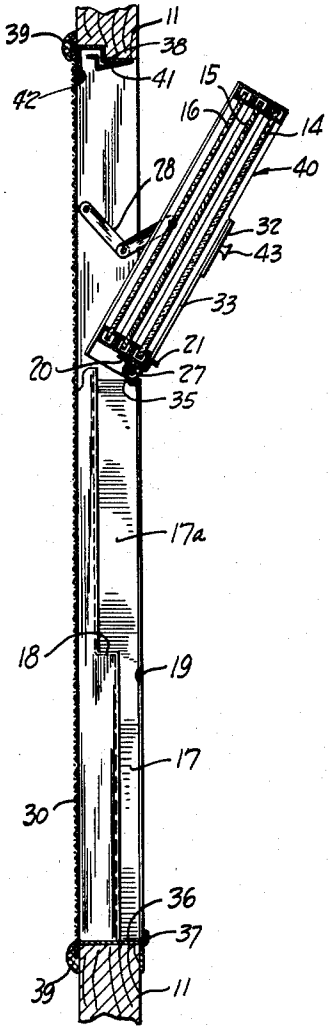


FIG. 5

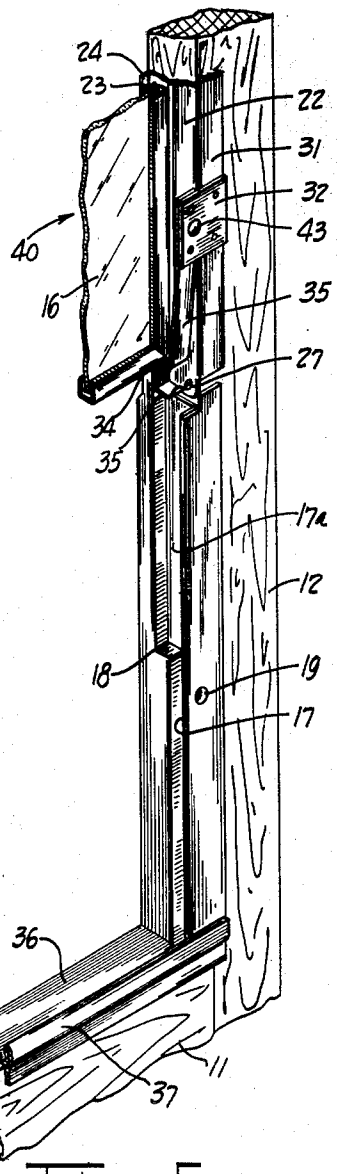


FIG. 6

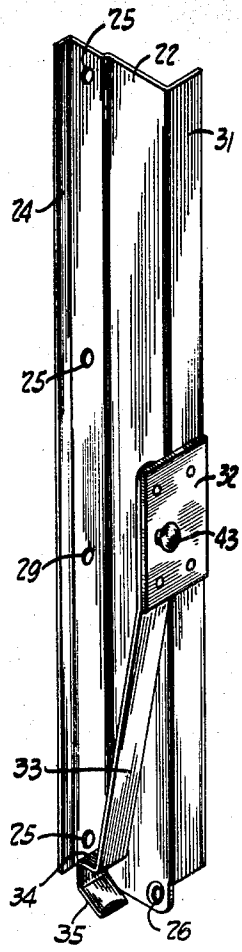


FIG. 7

INVENTOR.
MORRIS D. ORLIN
BY Sanford Schwarmacher
ATTORNEY

United States Patent Office

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2,707,311

WINDOW CONSTRUCTION

Morris D. Orlin, Shaker Heights, Ohio

Application June 12, 1953, Serial No. 361,213

1 Claim. (Cl. 20—45)

This invention relates to buildings and particularly to a window construction therefor.

The primary object of this invention is to provide a multiple hung sliding sash and window opening for a wall section that is an improvement over the construction disclosed in the United States Patent No. 2,601,706, entitled "Window Construction," issued to me on July 1, 1952.

Another object is to provide a window construction of the type stated for a wall section whose sash opening area may be approximately the entire area of the section, while at the same time permitting ready adjustment, removal and replacement of the sash, and permitting entire clearance of the sash opening while retaining the sash in the frame work, freely movable back to closure position.

A further object is to provide a closure having a plurality of sashes arranged therein, one above the other, which may be easily and quickly gathered together, one in front of the other, in a magazine located at the top of the closure, to clear the closure opening for ventilation purposes, by a simple upward movement of the lower one of the several sashes, without the necessity of handling the individual sashes, as is necessary in my aforementioned device, identified as U. S. Patent No. 2,601,706.

Another object is to provide a device of the type stated whose nested sashes, when in their open position in the magazine, may be instantly restored to their closed position by the release of a spring latch, without the necessity of touching any of the sashes at all.

Still another object is to provide a device that can be easily attached to existing constructions.

Additional objects, advantages and features of this invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, as will appear from the following description and accompanying drawings, wherein:

Figure 1 is a front elevation of the window construction exemplifying the invention;

Figure 2 is an enlarged broken vertical sectional view taken along the line and in the direction of the arrows 2—2 of the Figure 1;

Figure 3 is a similar view showing the lower and middle sashes as they appear nested in the magazine when in their raised condition;

Figure 4 is a perspective view of the window showing the magazine, the middle and lower sashes nested therein, as it appears in its tilted position clear of the window opening;

Figure 5 is a vertical sectional view taken along the line and in the direction of the arrows 5—5 of the Figure 4;

Figure 6 is a perspective fragmentary view of the right portion of the window with the lower and middle sashes removed;

Figure 7 is an enlarged perspective view of one of the magazine side flanges and its sash retaining latch; and

Figure 8 is a perspective view of the unmounted lock member.

Conducive to a better understanding of this invention, it may be well to point out that in the past open porches, breezeways and other area-ways have been enclosed by employing a number of so-called "combination storm and screen doors" assembled side by side around the periphery of the area to be sheltered. These "combination" structures comprise a rectangular frame having removable screened or glazed panels adapted to be interchangeably mounted thereon. The panel not being used at any particular time is separately stored apart from the frame structure. During the summer months, when the screened panels are being used, it is impossible to prevent rain and wind from entering the enclosed area during inclement weather unless the screened panels are bodily removed and replaced by the glazed ones. This is both inconvenient and time consuming. In a large enclosure the damaging effects of wind and rain will occur before all the panels can be interchanged. The self-storing feature of the glazed panels of the structure to be described permits the easy and instantaneous conversion of the closure from an open to a closed one or vice-versa.

My invention, in the preferred form shown in the drawings and briefly described hereinafter, comprises a frame **10** having jamb and rail portions **12** and **11** respectively, joined together to define a window opening **13** as shown in the Figures 1 and 4. The frame may be fabricated from any suitable rigid and durable material and is preferably made of wood or aluminum. The width and height of the frame may be varied to suit the purpose for which it is to be used. If used in association with similar units to enclose an open porch, the dimensions of the frame are similar to that of a door.

In Figure 1 there is seen such a door-like section having mounted thereon glazed sashes **14**, **15** and **16** which are fitted into the frame opening **13** and close it against the passage of air.

Reference numeral **30** indicates a fly screen that is permanently mounted on the frame on the outer face of the window opening **13**. The screen is held in place by a half-round moulding strip **39**. The screen **30** may take the form of an expanded metal multi-slotted structure having a plurality of closely spaced flat slots that prevent the entrance of the direct rays of the sun as well as insects, while permitting the free passage of air and light. This type of screening is presently available commercially under the trade-name of "Koolshade" and provides shade for an enclosure without the use of supplementary awnings or curtains.

Reference numeral **17** indicates two facing U-shaped channels in which the sashes **14** and **15** are free to move in a vertical direction. The upper section **17***a* of the channel **17** is wider than the lower section and is demarked therefrom by a ledge **18** which supports the lower edge of the middle sash **15**, as seen in Figures 2, 3, 5 and 6. The front face of the channel **17** has an inwardly extending button-like depression **19** embossed therein which extends into the plane of the channel and presses against the lower sash **14** at the point where it overlaps the middle sash **15**. The size of the button **19** is such that it will press the middle and lower sashes **15** and **14** together to form a weather-tight seal when they are in their closed condition, as seen in Figures 1 and 2.

The lower edge of the window opening **13** is covered with a metal flashing strip **36** which is shaped on its inner face to form a vertical gutter **37**, which keeps rain water from entering the enclosed area.

The metal frame of the lower sash **14** has a bracket **20** extending across it at its lower edge and along its outer face, for a purpose to be hereinafter disclosed.

An inwardly extending flange **21** which also serves as a lifting handle is positioned on the inner face of the frame of the sash **14** at a point that will enable the flange **21** to contact the top edge of the gutter **37** when the sash is in its closed position shown in the Figure 2, to

further seal the lower edge of the opening against the penetration of rain water.

The upper sash pane **16** is held in a frame **23** having a pair of laterally extending and facing side plates **22** which may be formed integral therewith or attached thereto. If made separately for attachment to the frame **23**, as shown in the drawings, each side plate **22** has a rear flange **24** against which the sash frame **23** is seated and held in place by screws **25***a* passing through holes **25**, as shown in Figures 4 and 7.

The side plates are made in pairs, there being a right hand and left hand plate associated with each frame **23**. Figure 7 illustrates a right hand plate of which the left hand plate is a mirror image.

The structure just described, hereinafter called the magazine **40**, is pivotally mounted at its lower edge within the window opening **13** by means of pivot pins or bolts **27** seated in holes **26** at the lower edge of each plate **22**, as shown in Figures 4, 5, 6 and 7. The magazine being positioned in the opening **13** so that the upper edge of the frame **23** will fit against the upper end of the window opening. The magazine is held in place against pivoting on its pivot pins **27** by a spring lock **38** mounted in the top rail **11** and flexibly pressed against the frame **23** of the sash **16**.

As seen most clearly in Figure 3, the aforementioned guide channels **17** are positioned in a plane immediately forward of the plane of the upper sash **16** and stop just short of the magazine **40**, in alignment with the lower edge thereof, so that the middle and lower sashes **15** and **14** can be slid from the channels **17** into the magazine **40** in front of the sash **16**.

Each side plate **22** has a front flange **31** that rests on the front face of the frame stiles **12**, as shown in Figures 1, 4, 6 and 7.

Reference numeral **32** indicates a cradle attached to each side plate flange **31**, lying in the plane thereof, and extending inwardly of the magazine at approximately the center thereof.

A latch **33** made of resilient spring steel is mounted in dependent manner from each cradle **32** in the plane of the channel **17** and at right angles thereto. The lower end of the latch is bent outward toward the magazine sash **16** to form a horizontal shelf **34** and then bent inwardly upon itself to form a cam surface and finger grip **35**. The length of the latch **33** being such that the cam **34** will press against the middle sash **15** at a point just below the point at which it overlaps the magazine sash **16** when the sash **15** is in its closed position as seen in Figure 2. The latch **33** is deformed at the edge of the cradle **32** so that the latch cam **35** will be constantly pressed toward the upper sash **16**.

As aforementioned, reference numeral **38** indicates a lock member, of which there are two, positioned at the top of the framed opening **13**, and engageable with the frame **23** of the sash **16**, as is seen most clearly in Figures 1 and **4**. The locks **38** are made of flat spring metal and are shaped as shown in Figure 8. Each lock **38** has a vertically extending finger **42** that may be flexed in a horizontal plane and a horizontally extending finger **41** that may be flexed in a vertical plane. When the magazine **40** is in its normally vertical, or closed position, as seen in Figure 2, the finger **41** is pressed against the inner face of the sash **16** and the finger **42** is pressed against the outer face of the sash **16**, which is thus locked in position between the two fingers **41** and **42**. When the two middle and lower sashes **15** and **14**, respectively, are raised into the magazine **40**, to take the position shown in Figure 3, the top edge of sash **15** raises the finger **41** vertically of the sash **16** and clear of the upper edge thereof. Immediately upon the removal of the restraining pressure of finger **41** against the inner face of sash **16**, finger **42** pushes inwardly against the sash **16** to tilt the magazine **40** slightly, so that the top of the sash **16** is moved under the finger **41** as seen in Figure 3. When the sashes **14** and **15** are lowered slightly to rest upon the latch shelves **34**, the finger **41** remains on the top of the sash **16**. The thus released magazine **40** may be easily swung inward by pulling on the two handles **43** to take the position illustrated in Figures 4 and 5. The magazine **40** may be relocked in its vertical position by merely pushing it against the flexible finger **42** until the finger **41** rides over the top of the sash **16**, clear of same, and snaps against the inner face thereof as explained hereinabove.

The structure illustrated in Figures 1 and 2 shows the window with sashes in their closed position. The lower sash **14** is seated between guide channels **17** and rests on the flashing **36** at the bottom of the opening **23**, with the handle **21** in contact with the upper edge of the vertical gutter edge **37**.

The middle sash **15** is seated between the upper section **17***a* of guide channel **17** and rests on the ledge **18**. The lower edge of the middle sash **15** is overlapped by the top edge of the lower sash **14**. The pressure buttons **19** in the front face of the channel **17** press against the lower sash to press it in turn against the middle sash to form a weather tight seat at that point. By referring to Figure 2, it will be seen that sash **15** is in a plane outward of that of sash **14** so that rain water running down the outside of sash **15** will run down the outside face of sash **14** and not enter the joint between the middle and lower sashes.

The upper edge of sash **15** overlaps the lower edge of magazine sash **16** and is pressed firmly thereagainst in a weather-tight seal by the lower cam ends **35** of the latches **33**. Again the sash **16** lies in a plane outward of the middle sash **15** and therefore rain water will continue over the joint between the two sashes and down the outside face of the middle sash **15**. Thus a weather-tight glazed closure is secured when the several sashes are in their closed position in the frame opening **13**.

To open the closure for the passage of air therethrough, it is only necessary to lift upwardly on the handle **21** of the lower sash **14** and slide the sash upward vertically of the channel **17** in front of the middle sash **15**. The outwardly extending flange **20** at the lower edge of the sash **14** extends into the vertical plane of the middle sash **15** and as the lower sash is moved into register with the middle sash, the flange **20** engages and supports the lower edge of the middle sash, lifting it off the ledge **18**. At the same time, the upper edge of the sash **14** enters between the latch cam surface **35** and the sash **15**, springing it inward so that the end of the shelf **34** rides on the inner face of the sash **14**. The continued upward movement of the lower sash **14** carries the middle sash **15** with it out of the upper end of the channel **17***a* and into the magazine **40** until the middle and lower sashes **15** and **14** are in register with the upper or magazine sash **16**. At this point, the lower edge of the sash **14** will pass above the upper edge of the latch shelf **34**. The flexibility of the latch **33** causes the shelf **34** to be snapped outward toward the sash **16** and under the lower edge of the sash **14**. Release of upward pressure on the handle **21** of sash **14** will cause the lower edge of the sash to fall slightly and come to rest upon the horizontal shelves **34** of the two latches **33**, as shown in Figures 3, 4 and 5. The sash **15** is supported on the flange **20** of the sash **14**.

As seen in Figure 3, the opening **13** is now two-thirds clear of all obstruction to the passage of air. To fully clear the opening **13**, the magazine containing the three sashes **14**, **15** and **16** may be tilted inward on its pins **27**, as seen in Figures 4 and 5. The tilted magazine **40** is supported by hinged brackets **28** which fold up when the magazine is in its vertical position.

The cradle elements **32** support the upper portions of the nested sashes and prevent their falling out of the magazine **40** when it is tilted as seen in Figures 4 and 5. The sashes **14** and **15** may be easily lifted

out of the tilted magazine for cleaning both sides thereof. The outside of the sash **16** may also be easily cleaned when the magazine is in its tilted position. Thus both sides of the sashes may be easily cleaned from the inside of the closure, without disturbing the screen **30**.

To close the opening **13**, it is only necessary to return the magazine to its vertical position, wherein the spring lock **38** engages the upper edge of the magazine frame **23**. The two latch finger grips **35** are grasped by the operator and pulled inward until the horizontal shelves **34** of the latches **33** are clear of the bottom edge of the sash **14**. The sash **14** then instantly falls vertically of the channel **17**, carrying the supported sash **15** with it. The sash **15** is deposited on the ledge **18** and the sash **14** continues downward until it rests on the lower edge of the opening **13** to again take the position illustrated in the Figures 1 and 2, wherein the closure opening **13** is entirely sealed against the passage of air or water.

It will be noted that with the magazine **40** in its vertical position, the sashes **14** and **15** need not be touched at all to close same. Again in opening the window, the middle sash **15** is not touched but is automatically picked up by the flange **20** of the lower sash **14** as the sash **14** is moved into the magazine **40**. The three sashes remain in the same relative vertical planes at all times. There is no necessity to rearrange or otherwise disturb the relative positions of the several sashes.

Since all of the elements remain mounted upon the frame **10**, even when the opening is entirely clear for ventilation of the enclosed area, there is no need to provide storage space for any of the elements during certain seasons of the year. Furthermore, the amount of ventilation can be regulated by the proper manipulation of the three movable elements, in contrast to prior art devices which require their openings to be entirely closed or entirely open.

In the foregoing specification the invention is described as having two vertically movable sashes, but a single movable sash could also be used if only a small window opening is needed.

It will now be clear that there is provided a device which accomplishes the objectives heretofore set forth. While the invention has been disclosed in its preferred form, it is to be understood that the specific embodiment thereof as described and illustrated herein is not to be considered in a limited sense as there may be other forms or modifications of the invention which should also be construed to come within the scope of the appended claim.

I claim:

A window construction, comprising in combination, jambs and top and bottom rails together defining a framed opening, an upper sash member including laterally extending and facing side plates hingedly mounted in the opening and normally lying in the vertical plane thereof, each of said side plates having a body portion lying parallel to the jamb surface forming the framed opening and a cradle element at a right angle thereto extending into said opening, each of the jambs having a single longitudinally extending guide channel, open to the framed opening, lying in a plane immediately forward of the plane of the upper sash member and terminating at the said side plates, a ledge positioned at the mid-point of each channel, the aforesaid cradles being spaced from the upper sash to form therewith an interrupted continuation of the channels, a dependent flexible latch mounted on each cradle and extending downward therefrom parallel to the body side plate, the said latch having a horizontal shelf formed integral therewith, at the lower end thereof, the said shelf being faced toward and perpendicular to the uper sash, and including a cam surface curved downwardly and away from the leading edge thereof and across the upper end of the aforesaid channel, middle and lower sash members slidably mounted in overlapping engagement in the channels below the upper sash member and together with the upper sash member normally closing the said opening, in its closed position the middle sash is supported by the ledges with the latch cam riding upon the upper edge thereof to press same against the lower edge of the upper sash, the lower sash having a flange at the bottom edge thereof extending into the vertical plane of the middle sash, the said lower and middle sash members being slidable longitudinally of the channels, between the side plates and latches, into an alternate position wherein the lower sash is supported upon the latch shelves with the middle sash member supported upon the lower sash flange, the two sashes being nested between the upper sash and the cradles thereof, a lock member mounted in the top rail of the framed opening, engageable with the upper sash, the lock having a first vertically extending dependent flexible finger pressed against the outer face of the upper sash and a second horizontally extending flexible finger engageable with the inner face of the upper sash and lying across the vertical plane of the middle sash, perpendicular to the first finger, the so engaged upper sash being in an immovable or locked condition, the second finger being movable to a second position, upward and clear of the upper sash, by engagement with the upper edge of the middle sash, the first finger being automatically flexed, inward of the framed opening, to a second position to tilt the upper sash to a position under the second finger, when the second finger is in its second position, the so tilted upper sash being in a movable or unlocked condition wherein the said unlocked upper sash member and its cradled middle and lower sashes are swingable inwardly out of the vertical plane of the framed opening to clear the same for the passage of air, and means for maintaining the three sashes in their swung condition.

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