Sept. 4, 1956 J. D. REINHARDT 2,761,498

SELF-STORING STORM WINDOW AND SCREEN

Filed Aug. 20, 1952 3 Sheets-Sheet 1

Fig. 1

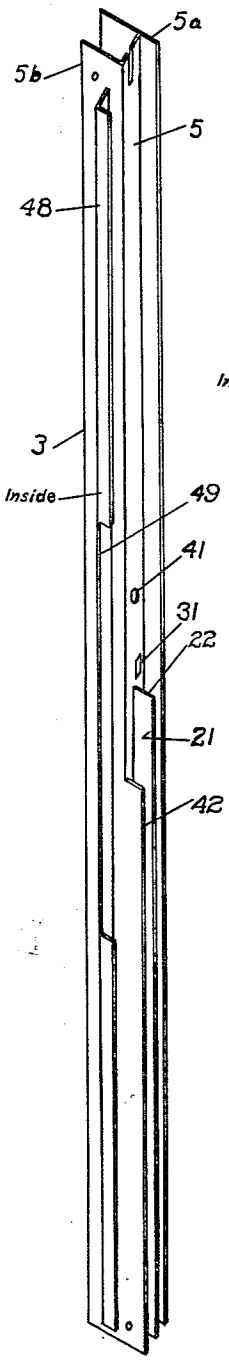


Fig. 2

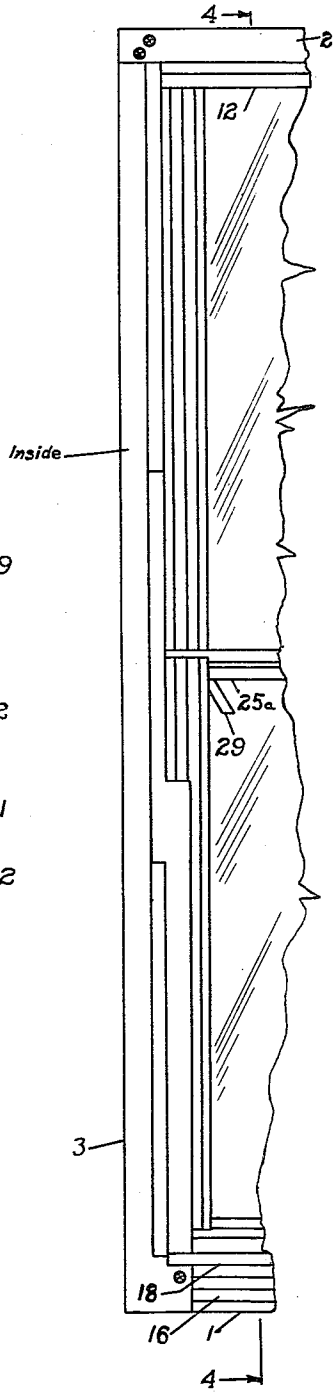
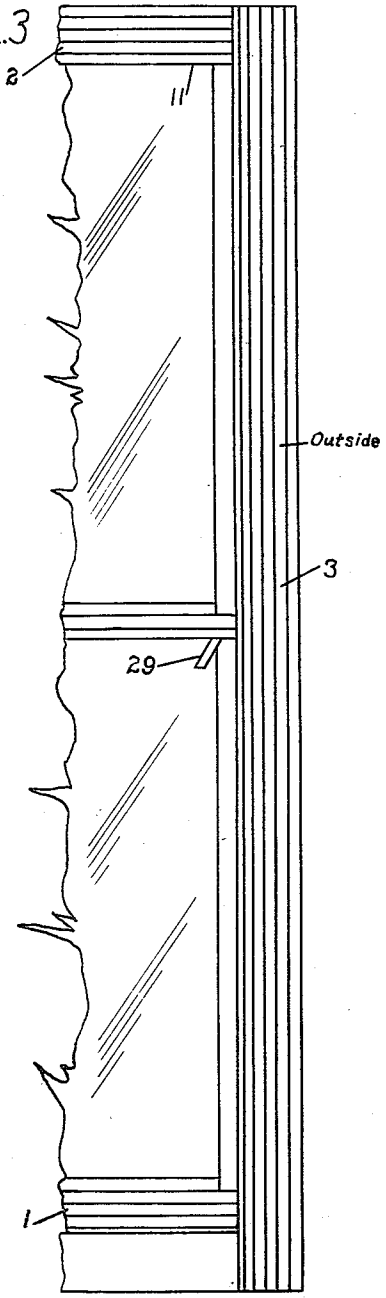


Fig. 3



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Sept. 4, 1956 J. D. REINHARDT 2,761,498

SELF-STORING STORM WINDOW AND SCREEN

Filed Aug. 20, 1952 3 Sheets-Sheet 2

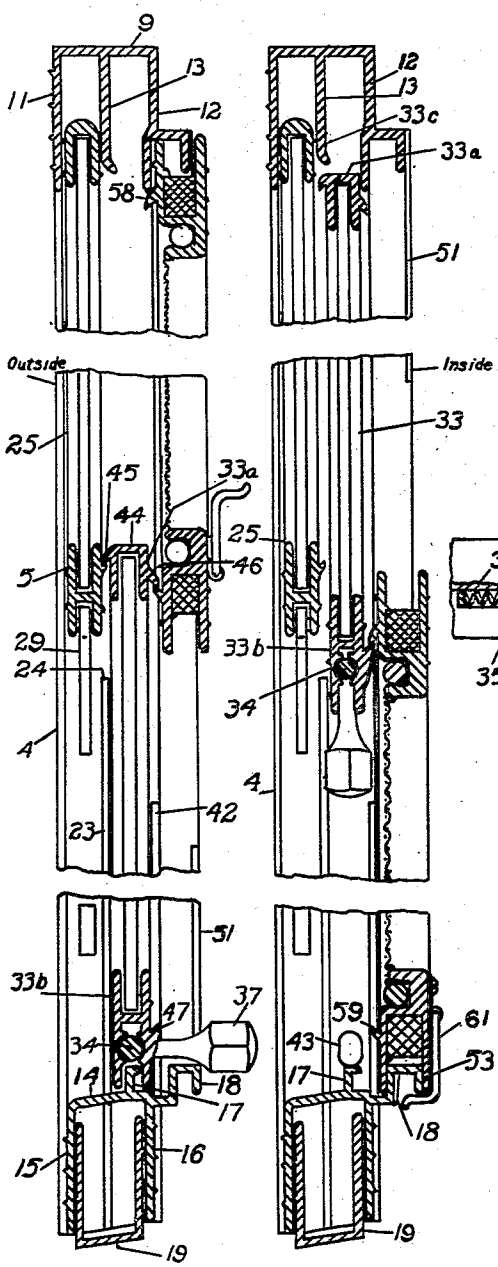


Fig. 4 Fig. 5

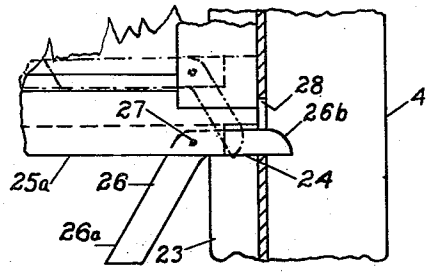


Fig. 6

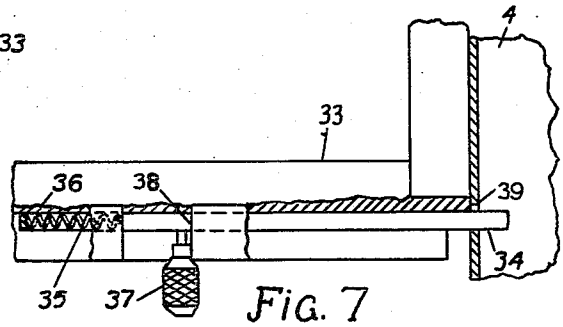


Fig. 7

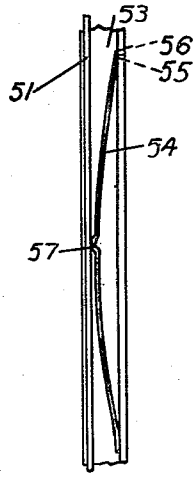


Fig. 8

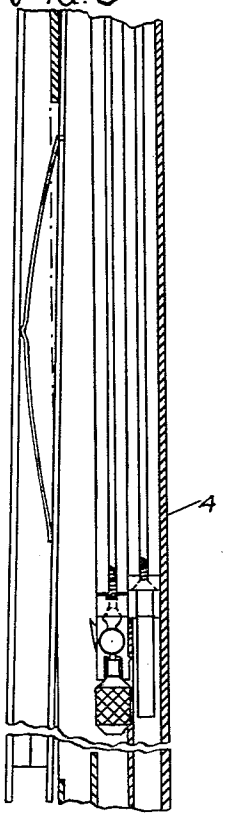
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Sept. 4, 1956 J. D. REINHARDT 2,761,498

SELF-STORING STORM WINDOW AND SCREEN

Filed Aug. 20, 1952 3 Sheets-Sheet 3

Fig. 9



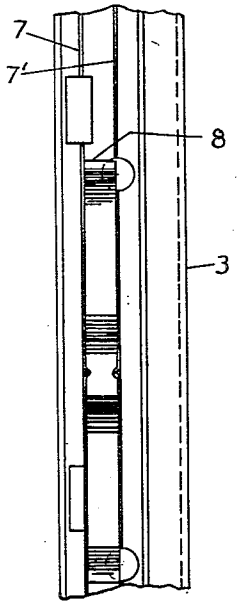


Fig. 12

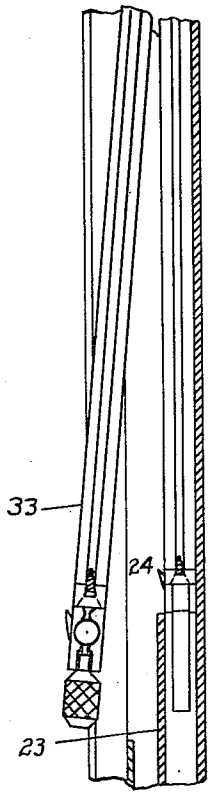


Fig. 10

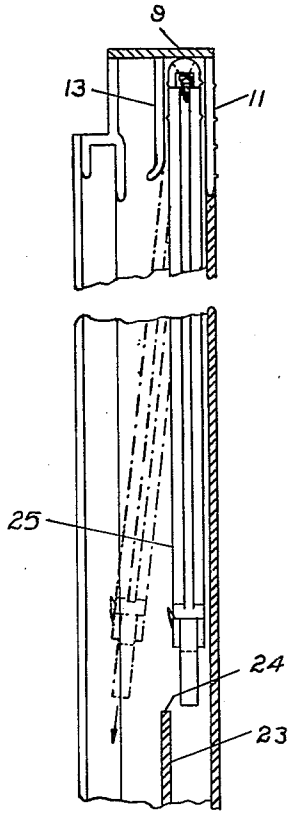


Fig. 11

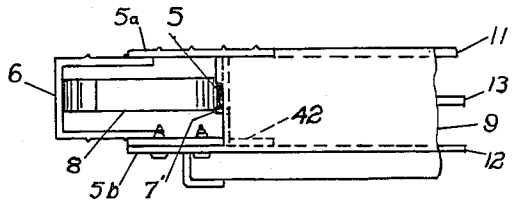


Fig. 13

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SELF-STORING STORM WINDOW AND SCREEN

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Application August 20, 1952, Serial No. 305,346

18 Claims. (Cl. 160—90)

The present invention relates to a combination self-storing storm window and screen of the metal frame type.

Windows of this type are provided with upper and lower glazed sashes, and the invention is directed to such a window having a screen sash which is movable from an upper storage position to a lower ventilating position.

According to one feature of the present invention the outer or upper window sash is provided with a catch operable from the outside which requires lifting of the outer sash to release the catch, and this upper sash has an interlock with the inner or lower sash, so that by locking the lower sash the upper sash is locked against the initial upward movement required to release its catch. However, when the lower sash is raised access to the catch of the upper sash can be had from the inside through the window opening.

Another feature of this invention involves a construction which enables the provision of a double interlock between the screen sash and its adjacent glazed sash so that the screen can be used for ventilation in the upper part of the frame when the upper sash is lowered, or can be used for ventilation in the lower part of the frame. When the screen sash is in its lower operative position it forms an interlock with the adjacent raised glazed sash which prevents entrance of insects. When the screen sash is in its upper position and the adjacent glazed sash is in its lower closed position the screen sash also forms an interlock with the glazed sash. To enable the projecting parts of the two sashes to pass for raising or lowering the respective sashes the screen sash is mounted to have movement toward and away from the glazed sash, and a spring is provided to hold the screen sash against the glazed sash.

In addition to the above features the invention comprises an arrangement by which all three sashes may be removed from their respective channels. This involves openings or cut outs in the respective outside and inside sash channels, with the screen sash confining the inside sash in its respective track in raised position.

The invention will be described in greater detail in connection with the accompanying drawings illustrating a preferred embodiment of the invention by way of example, and wherein:

Figure 1 is a perspective view of a style of the window frame;

Figure 2 is a fragmentary elevational view of the assembled window frame and glazed sash as seen from the inside;

Figure 3 is an obverse view of Figure 2;

Figure 4 is a cross sectional view along lines 4—4 of Fig. 2 showing the glazed sash closed and the screen sash in storage position;

Figure 5 is a view similar to Figure 4, with the lower sash raised and the screen sash lowered;

Figure 6 shows the upper sash latch;

Figure 7 shows the lower sash latch;

Figure 8 is an edge elevation view of the screen sash;

Figure 9 is a fragmentary sectional view illustrating removal of the screen sash;

Figure 10 is a similar view illustrating removal of the lower sash;

Figure 11 is a similar view illustrating removal of the upper sash;

Figure 12 is a fragmentary side elevation of the frame; and

Figure 13 is a fragmentary plan view of the frame.

Referring to the drawing the window frame comprises a bottom rail **1**, a top rail **2** and oppositely arranged stiles **3** and **4** (Fig. 4). Each stile comprises an H-bar **5** (Figs. 1 and 13), which receives a channel bar **6** between the flanges **5***a*, **5***b*. The H-bar has internal flanges 7—7′ (Fig. 12) which receive leaf springs **8**, these flanges being peened to hold the springs in place. The springs allow telescopic movement of the channel bar **6** to permit the frame to be inserted in a window opening, and urge the channel bars out when the frame is in position. The top rail **2** (Figs. 4 and 13) of the frame comprises a channel with a base **9**, an exterior ribbed flange **11**, an interior flange **12** and a middle flange **13**.

The bottom rail **1** (Fig. 4) comprises a channel member providing a base **14** with an exterior ribbed flange **15** and an interior ribbed flange **16**. A rib **17** extends across the top of the channel base and a J-shaped piece **18** is fastened to interior flange **16**. The bottom rail telescopically receives a channel **19** which is allowed to drop by gravity to fill in the space between the bottom rail **1** and the window opening. The window frame may be held in the window opening by countersunk screws or the like extending through the frame (not shown). The bottom rail, stiles and top rail are held assembled by suitable sheet metal or self tapping screws.

Stile **3** (Fig. 1) has an intermediate flange **21** in substantially the same plane as middle flange **13** of the top rail. This flange **21** terminates at **22** near the middle of the frame, and, stile **4** has a similar intermediate flange **23** (Figs. 4 and 5) which terminates at **24**, substantially at or below the level of edge **22**. The distance between the edge **24** and the base **9** of the top rail is slightly greater than the height of the exterior glazed sash **25**. The bottom rail **25***a* of sash **25** provides a channel in which is located a bell crank latch **26** on a pivot **27** providing an operating end **26***a* and a detent end **26***b*. As shown in Figure 6, the detent end enters an aperture **28** in the stile **4**. A similar latch **29** at the other end cooperates with an aperture **31** in stile **3**. These detents are so balanced that the weight of the operating levers urge the detent ends into the apertures.

Referring to Figures 6 and 11, when the screen sash and lower glazed sash are removed the upper sash can be removed as follows: the upper sash is raised up against base **9** of the top rail and the latches are manually operated to raise the operating ends **26***a*, thus retracting the detent ends **26***b* from the respective apertures. The sash now is high enough so that the detent ends will clear the top edges **22**, **24** of the flanges **21**, **23** as the sash is drawn inwardly to the dot and dash line position shown in Figure 11. The sash then is drawn downwardly to release it from flanges **11** and **13** so the sash can be removed. It will be observed there are no internal flanges in the upper half of the window frame to interfere with the removal of the sash. In normal assembled relation, as shown in Figure 4 the detents hold the sash in position so that flange **13** prevents the sash falling inwardly out of place while flange **11** prevents the sash falling outwardly. If desired, openings similar to aperture **28** may be provided at various elevations in the frame, so the sash can be lowered to corresponding intermediate positions.

When the lower sash **33** is in its upper position (Fig. 5) the upper rail **33***a* engages between outer sash **25** and flange **12**, and the flange **13** has its edge offset at **33***c* to act as a stop. At the bottom rail **33***b* of the sash a channel is provided for a detent rod **34** which is biased outwardly by a spring **35** between the end of the rod and an abutment **36** formed by striking out a tab from the bottom sash. An operating knob **37** extends through a cut out **38** in the sash. This rod is pressed into an aperture **39** provided in stile **4**. A similar detent is provided at the opposite edge of the sash, and the engagement of these detents in their respective apertures **39**, **41** hold the sash in its upward position between the flange **12** and sash **25**. To lower the sash **33**, the handles of the latch are pressed toward the middle to release the latches, and the sash then can slide down between flanges **21** and **42** of the stile. The flange **42** may be a continuation of flange **5***b*. The flange **42** terminates below edge **22** so that with the screen removed, the lower sash can be removed by raising it in the frame to the upper position, then drawing it inwardly as shown in Figure 10, then downwardly at an inclination to clear flanges **42**. Apertures are provided in the stiles so that the lower sash can be held by the detents at various levels, and holes **43** at the bottom position enable locking of the lower sash. In the lowermost position of sash **33** the rib **17** is received in the lower channel to hold the sash against rattling, and the operating knobs **37** can turn inward to allow full closing of the sash. To open the sash it is necessary only to operate the knobs **37** to release the detent and lift the sash.

The lower rail **25***a* of sash **25** on the inside has a projecting flange **44** providing an upwardly open channel, and the upper rail **33***a* of the lower sash is provided with a similar rib or flange **45** providing a downwardly open channel. When the two sashes are in their closed positions the flanges **44**, **45** overlap and interlock so that the upper sash can be lifted only together with the lower sash. When the lower sash is locked in closed position the upper sash is interlocked therewith by the flanges **44**, **45** so that the upper sash cannot be raised sufficiently to release the detent ends of the latches from their locking apertures. Thus, it is not possible to release and lower the upper sash when the lower sash is locked in its lowermost position. The upper rail **33***a* has a similar rib **46** on its inside face, and the bottom rail **33***b* has a rib **47** providing an upwardly open channel for a purpose presently to be described.

The stile **3** has an L-shaped flange **48** secured to the face of flange **5***b* so that its edge terminates substantially in the plane of the cross web of the H-bar, and the middle portion of this flange is cut away, as indicated at **49**. A similar flange **51** similarly cut away is provided on stile **4**. These flanges provide a guide for the screen sash **52**. The sash **52** is suitably constructed to provide a peripheral channel **53** around the sash, this channel being wider than flanges **48** and **51** so the flanges may be received in the channel with a very loose fit. Within the screen channel at each side is located a bowed leaf spring **54** having a bent end **55** which anchors the spring in a recess **56** in the sash. This spring preferably has a transverse bead **57** at its middle. In normal operative position the flanges **48**, **51** are received between the spring **54** and the wall of the channel **53**. This spring provides sufficient friction to hold the screen in raised or partly raised position.

At the top the screen sash has a rib **58** forming a downwardly open channel so that when the inner sash is raised and the screen sash is lowered this channel is adapted to interlock with rib **47** so as to prevent entrance of insects. The bottom rail of the screen has a similar upturned rib **59**. In raising the screen sash the bottom rib **59** must pass over the bottom rib **47** of the lower glazed sash. This is provided for by the springs **54** which yield to allow such passing. This arrangement of upper and lower interlocking ribs allows the screen sash to be used in the upper window portion for ventilation when the upper and lower glazed sashes are lowered. In such position the interlock between ribs **46** and **59** prevents entrance of insects between the screen and the lower sash, and the spring mounting of the screen sash allows rib **46** to cross rib **58** on the screen in raising or lowering the glazed sash or screen. When the screen sash is in its lowermost position the channel **53** in the lower rail receives the J-shaped member **18** to hold it against rattling. In this position the handle **61** latches under the member **18** to lock the screen in position.

I claimed as my invention:

1. In a window: a window frame having a pair of stiles each having three flanges providing pairs of corresponding opposed vertical channels; outer and inner window sashes movable in overlapping relation in said vertical channels, the one flange of each stile on the interior side of said frame terminating near the middle of the frame to allow removal of the inner sash from the interior side of the frame; and the middle flange of each stile terminating near the middle of the frame to allow removal of the outer sash from the interior side of the frame when the inner sash has been removed; and a fourth flange on each stile on the interior side of the frame for receiving a third sash, said fourth flange extending toward the sash and no further than the base of said window channel and being discontinued near the middle to permit removal of the third sash and of the inner and outer sashes.

2. A window as specified in claim 1 wherein said third sash has channels at its sides for receiving said fourth flange.

3. A window as specified in claim 2 wherein said channels of the third sash are wider than said fourth flange received therein, and spring means in said channels biases the third sash toward the second sash.

4. A window as specified in claim 3 wherein said spring is in the form of a bowed leaf having a projection adapted to engage said fourth flange.

5. A window comprising: a frame having a top rail with three flanges providing a pair of horizontal parallel channels, and stiles each having three lateral flanges extending from the bottom and terminating adjacent the middle of the frame to provide a pair of channels substantially in the plane of the top channels; upper and lower sashes adapted to be positioned for sliding movement in said stile channels; cooperating releasable latch means on the upper sash and frame for latching the upper sash in upper position, in which position the middle stile flanges overlap the upper sash and the base of the corresponding top channel provides a clearance with the top of the upper sash which allows the latched upper sash to be raised above the flanges for removal; and the lower sash, in raised position extending into the corresponding horizontal channel with its bottom above the terminal edges of the third flanges, the middle flange of the top rail being positioned above the upper edge of the lower sash in such position.

6. A window comprising: a frame having channels for slidably receiving outer and inner sash, the upper rail of said frame providing an inverted channel for receiving the upper end of the outer sash; an outer sash; an inner sash; means for latching the outer sash in upper position to provide a clearance between the base of said inverted channel and the top of the upper sash, means releasing said latching means upon lifting of the upper sash into said channel; means for latching the inner sash in lowered position; and interlocking means on the outer and inner sashes maintained engaged in the upper and lower positions of the outer and inner sashes respectively to prevent lifting of the outer sash independently of the inner sash, whereby the outer sash is secured against opening from the outside.

7. A window as specified in claim 6 wherein said means for latching the upper sash comprises pivoted bell crank detents having detent ends adapted to engage sockets in the frame and having depending operating ends extending below the bottom edge of the upper sash.

8. A window as specified in claim 7 wherein said depending operating ends bias the detent ends toward latching position.

9. A window as specified in claim 7 wherein the length of the detent ends from the pivot is greater than the distance between the pivot and the lower edge of the socket.

10. A window comprising a frame having vertical channels; upper and lower sashes located in said channels for sliding movement; means on the frame providing a guide track; a third sash guided by said track for vertical sliding movement across the lower sash; ribs at the top and bottom of the lower sash; ribs at the bottom and top on the third sash adapted to cooperate respectively with the ribs on the lower sash to provide an interlock; and spring means biasing said third sash in the track allowing movement of the third sash against the spring bias to permit transversal of said ribs.

11. A window comprising: a window frame having a top rail with an exterior downwardly extending flange and a second interiorly spaced downwardly extending flange providing a channel therebetween extending along the top rail; stiles connected to the top rail, each stile having an exterior laterally extending integral flange substantially in alignment with the exterior flange of the top rail, and a second interiorly spaced laterally extending integral flange substantially in alignment with the second flange of the top rail, said second stile flange extending upwardly from adjacent the bottom of the frame to form a channel with the first stile flange receiving an outer sash for sliding movement in said channel, said second stile flange having its upper edge terminating near the middle of the frame substantially engaging the inside face of the bottom of the outside window sash when the outside window sash is in normal upper position; the channel formed by the top rail flanges being of a depth to allow the outside window to enter and raise above the upper edge of the second stile flange; and means for releasably locking said upper sash in said normal upper position against sliding movement.

12. A window as specified in claim 11 wherein: said releasable locking means includes cooperating means on the outer sash and frame movable to disengaging position by upward movement of said outer sash from its normal upper position.

13. A window as specified in claim 11 wherein: each stile has a third integral flange interiorly spaced from the second stile flange extending upwardly from adjacent the bottom of the frame to form a channel with said second stile flange receiving an inner sash for sliding movement in said channel, said third stile flange having its upper edge terminating near the middle of the frame and lower than the upper edge of the second stile flange to enable removal of the inner sash when in raised position; and said second rail flange being turned inwardly to provide an upper stop for the lower sash.

14. A window as specified in claim 13 wherein said outer and inner sashes are of a height to overlap; the bottom rail of the outer sash has a flange on its inner face forming an upwardly open channel; and the top rail of the inner sash has a downward extending flange on its outer face adapted to be interlocked with said upwardly open channel.

15. A window as specified in claim 14 wherein: said releasable locking means includes cooperating means on the outer sash and frame movable to disengaging position by upward movement of said outer sash from its normal upper position; and having means for releasably locking said inner sash in closed position, the interlocking of the outer and inner sashes prevent raising of the outer sash to release the locking means of the outer sash.

16. A window as specified in claim 13 wherein each stile has a fourth flange extending toward the sash substantially no further than the base of the channel for the inner sash; and a third sash slidably confined by the fourth flange; said fourth flange being discontinued near the middle to provide an opening through which the third sash can be removed.

17. A window as specified in claim 16 wherein: said frame has an inward extension near the bottom and said third sash has a bail handle with an angularly offset portion adapted to resiliently engage under the bottom extension to lock the third sash.

18. A window comprising: a window frame having a top rail with an exterior downwardly extending flange, and a second interiorly spaced flange providing therewith a channel along the top rail; stiles connected to the top rail, each stile having an exterior laterally extending integral flange substantially in alignment with the exterior flange of the top rail, and a second interiorly spaced laterally extending integral flange forming with said first stile flange a vertical channel; said second stile flange extending upwardly from adjacent the bottom of the frame and terminating near the middle; an outer sash in said channel for sliding movement therein; an aperture in said stile; a detent pivoted adjacent the bottom of said sash of a length to be received in said aperture when said sash is in its normal upper position, said detent and aperture being of such size that upon raising said sash from its normal position the detent can be pivoted clear to said aperture to releasing position; and the top rail channel being of a depth to allow the sash to be raised for releasing said detent.

References Cited in the file of this patent

UNITED STATES PATENTS

1,998,315	Glaser	Apr. 16, 1935
2,171,454	Porter	Aug. 29, 1939
2,262,670	Ensminger	Nov. 11, 1941
2,569,942	Milnor	Oct. 2, 1951
2,589,161	Sylvan	Mar. 11, 1952
2,628,678	Webster	Feb. 17, 1953
2,636,227	Altwies	Apr. 28, 1953
2,640,535	Milone	June 2, 1953