Aug. 12, 1958 A. BARSOTTI 2,846,733

WINDOW WITH SLIDABLE LOWER AND UPPER SASHES

Filed Aug. 23, 1955 3 Sheets-Sheet 1

Fig. 1

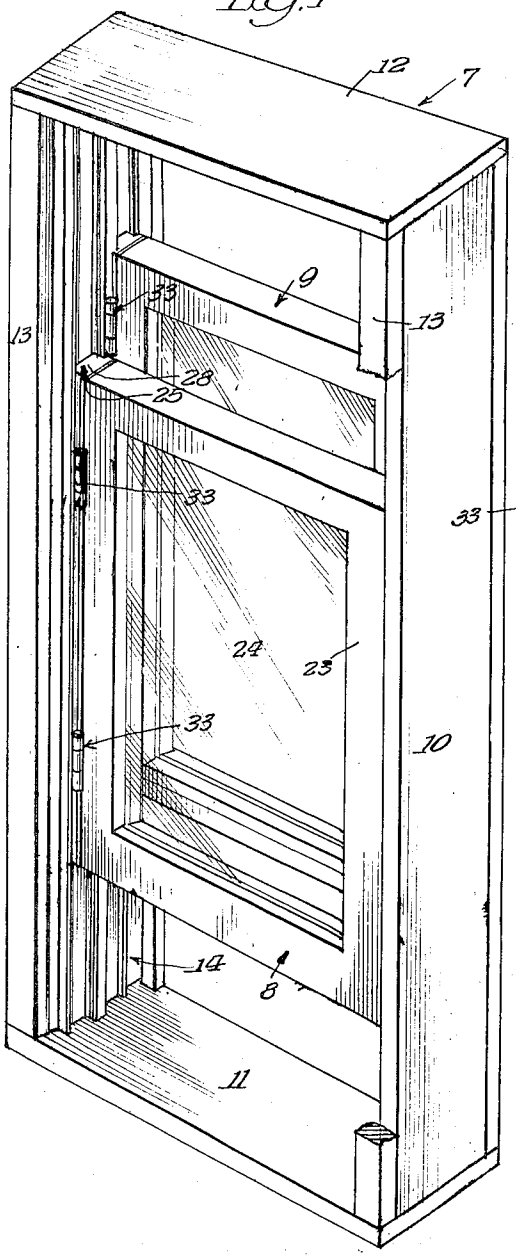
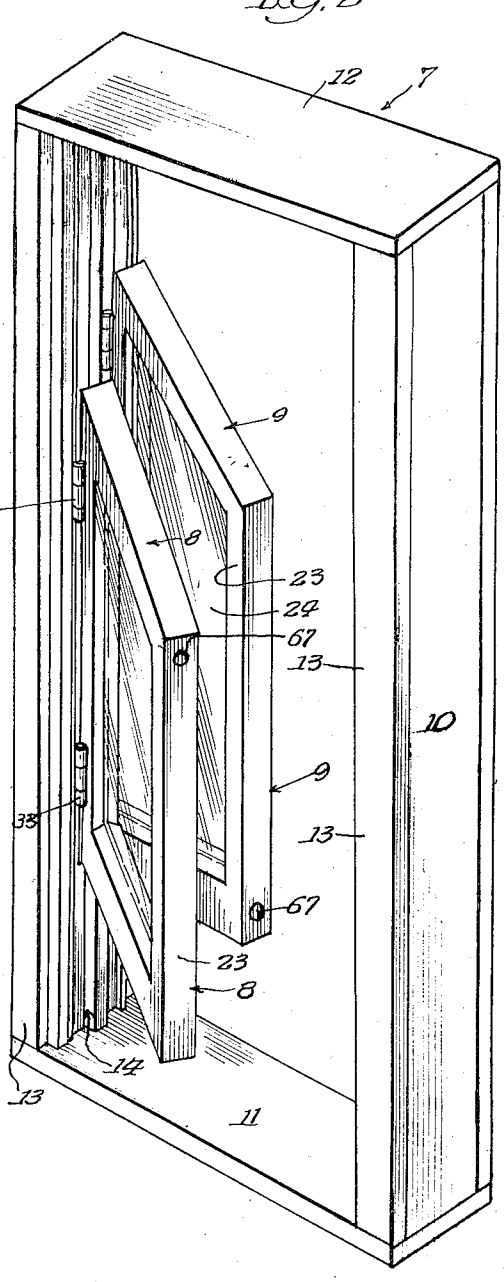



Fig. 2




Inventor
Armando Barsotti
By Fred Gerlach Atty.

Aug. 12, 1958 A. BARSOTTI 2,846,733

WINDOW WITH SLIDABLE LOWER AND UPPER SASHES

Filed Aug. 23, 1955 3 Sheets-Sheet 2

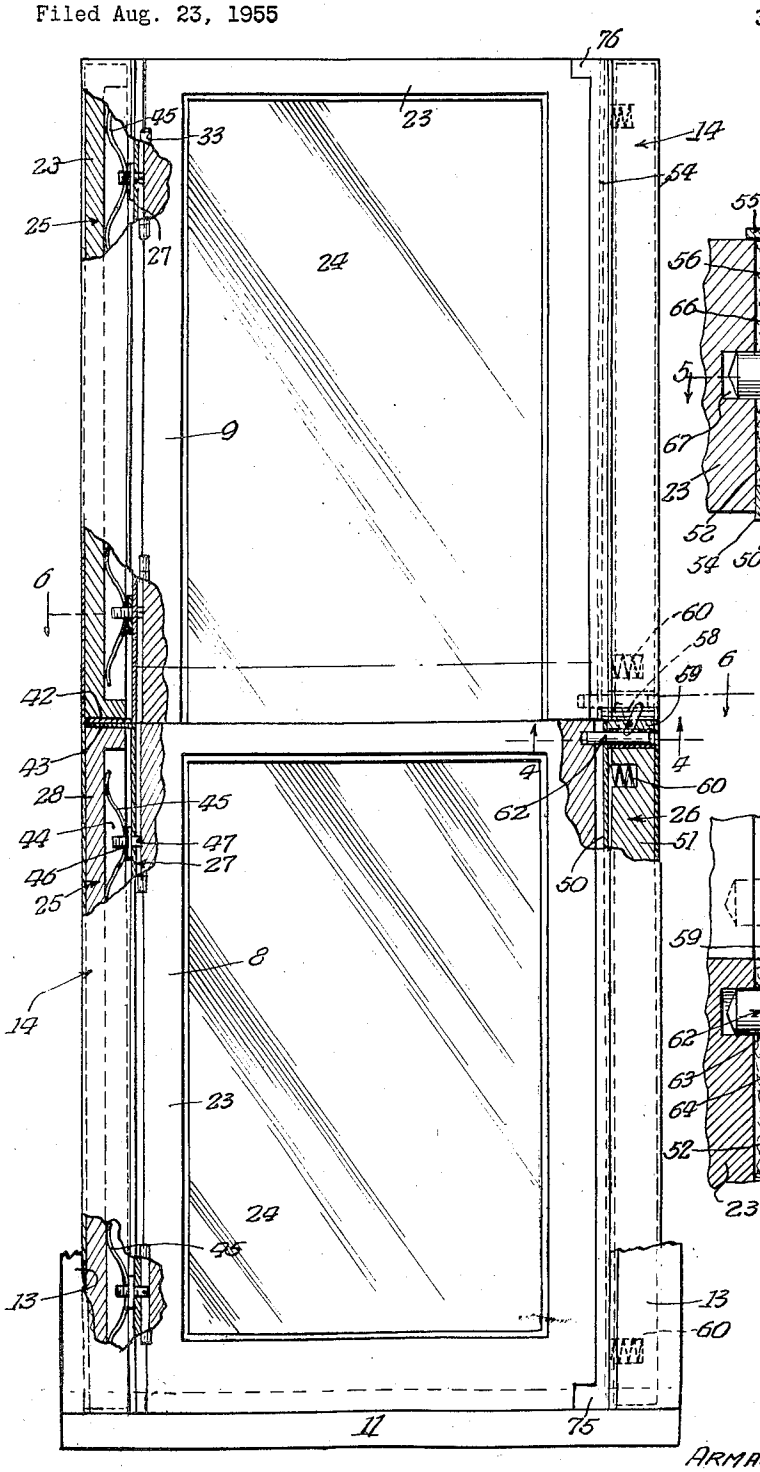



Fig. 3

Fig. 4

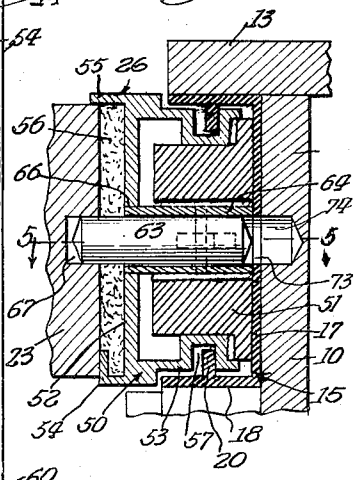
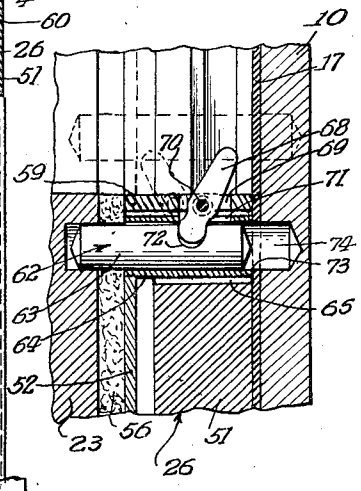



Fig. 5




Inventor
ARMANDO BARSOTTI

By Fred Gerlach
Atty.

Aug. 12, 1958 A. BARSOTTI 2,846,733

WINDOW WITH SLIDABLE LOWER AND UPPER SASHES

Filed Aug. 23, 1955 3 Sheets-Sheet 3

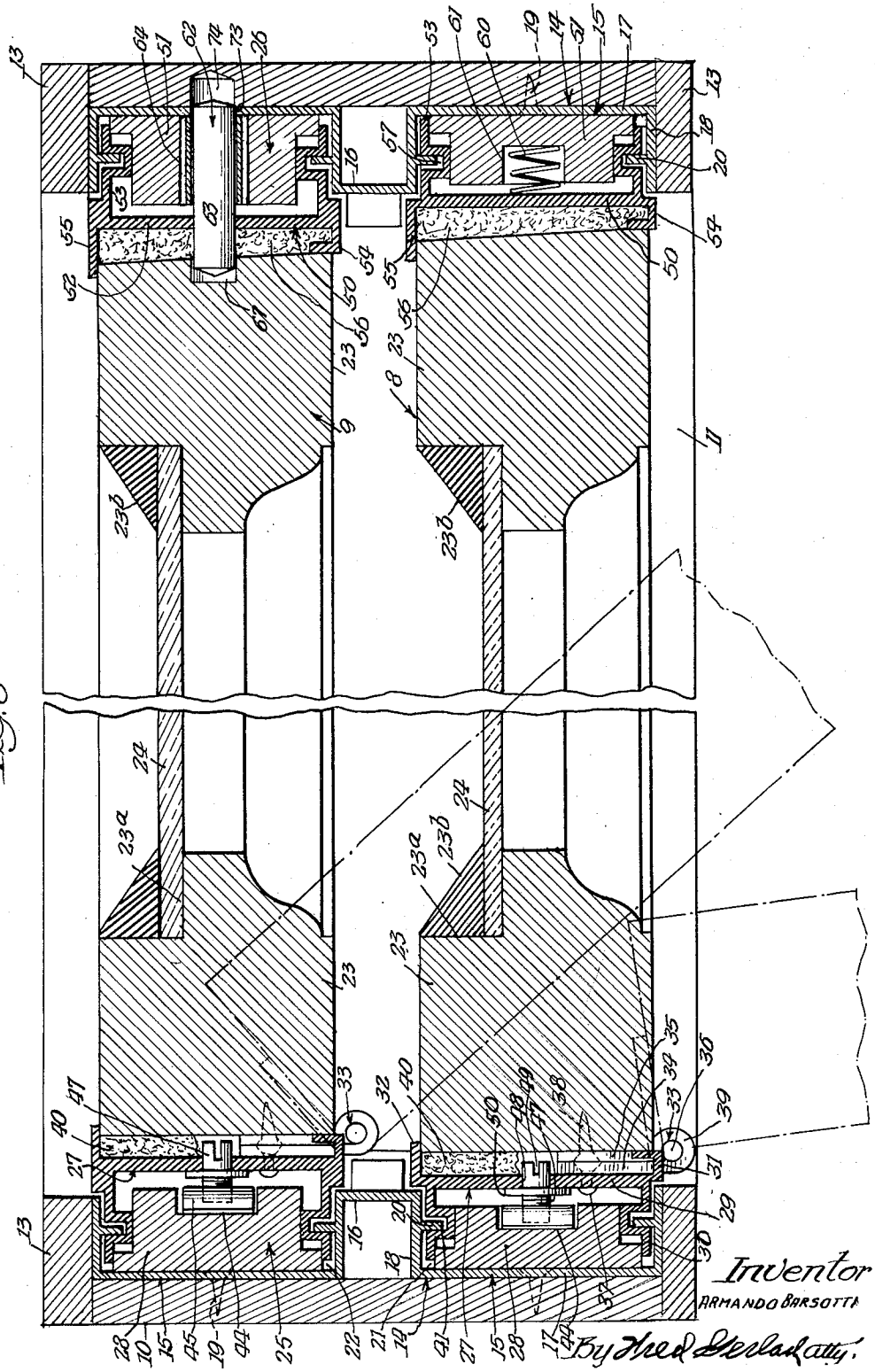


Fig. 6

Inventor
ARMANDO BARSOTTI
By Reed & Berland Attys.

United States Patent Office 2,846,733 Patented Aug. 12, 1958



2,846,733

# WINDOW WITH SLIDABLE LOWER AND UPPER SASHES

Armando Barsotti, Chicago, Ill.

Application August 23, 1955, Serial No. 530,103

5 Claims. (Cl. 20—50)

The present invention relates generally to windows. More particularly, the invention relates to that type of window which is adapted to be positioned in an opening in the wall of a building, serves to permit light and sometimes air to pass into the building interior from the outside, and as its principal components or ports comprises: (1) a rigid vertically elongated rectangular frame which is shaped conformably to, and is designed to be fixedly mounted in, the opening in the building wall and consists of a pair of vertically extending laterally spaced side members with inner and outer vertically extending full height slideways along their inner or opposed side surfaces, a horizontally extending sill-forming bottom member between the lower ends of the side members, and a horizontally extending top member between the upper ends of the side members; (2) a rectangular lower sash which is mounted in the inner slideways so that it is slidable downwards into a closed position wherein it extends across the lower half portion of the frame interior and upwards into an open position wherein it extends across the upper half portion of the frame interior and exposes the lower half portion of said frame interior; and (3) a rectangular upper sash which is mounted in the outer slideways so that it is slidable upwards into a closed position wherein it extends across the upper half portion of the frame interior and downwards into an open position wherein it extends across the lower half portion of the interior of the frame and exposes the upper half portion of the frame interior.

One object of the invention is to provide a window which is an improvement upon, and has certain inherent advantages over, previously designed windows of the aforementioned type and is characterized by a novel arrangement of parts, easy manipulation and comparatively low cost of manufacture or fabrication.

Another object of the invention is to provide a window of the type under consideration in which the inner and outer vertically extending slideways that extend along the inner side surfaces of the side members of the frame are formed of single pieces of extruded metal, and the sashes are provided at the sides thereof with separately formed composite vertically extending slide bars which are disposed in interfitting relation with the extruded metal pieces constituting the slideways and consist of extruded metal channel-shaped inner parts and wooden outer parts.

Another object of the invention is to provide a window of the last mentioned character in which the vertically extending slide bars on the sides of the sashes are provided with spring arrangements whereby the wooden outer parts thereof are urged outwards with respect to the extruded metal inner parts in order that they grip frictionally the slideways and thus serve to hold the sashes in the various positions into which they are slid without the use of conventional sheave and sash weight arrangements.

A further object of the invention is to provide a window of the type and character under consideration in



which the sashes have hinges between certain sides thereof and the extruded metal inner parts of the adjacent slide bars, embody latches between their other sides and the extruded metal inner parts of the adjacent slide bars, and are adapted when the latches are released or unlatched to be swung inwards with respect to the frame and the last mentioned adjacent slide bars in order that both sides of the panes of glass thereof may be readily washed from the inside of the window as a whole.

A still further object of the invention is to provide a window which is generally of new and improved construction and effectively and efficiently fulfills its intended purpose.

Other objects of the invention and the various advantages and characteristics of the present window will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter described and are more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of the specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is an inside perspective view showing a window embodying the invention with the sashes thereof in their normal or operative position wherein they are slidable upwards and downwards within the window frame;

Figure 2 is a similar perspective view except that it shows the sashes after they have been swung inwards with respect to the frame in order that both sides of the panes of glass thereof may be washed from the inside of the window;

Figure 3 is a view, partly in elevation and partly in section, showing the lower and upper sashes in their closed positions and illustrating in detail the construction and design of the spring arrangements whereby the wooden outer parts of the slide bars at the sides of the sashes are urged outwards into frictional engagement with the vertically extending slideways;

Figure 4 is an enlarged horizontal section taken on the line 4—4 of Figure 3 and illustrating in detail the construction and design of the latch for holding the lower sash in its normal or operative position wherein the distal side portion thereof is in latched relation with the adjacent slide bar;

Figure 5 is a section on the line 5—5 of Figure 4; and

Figure 6 is an enlarged horizontal section taken on the line 6—6 of Figure 3 and disclosing the cross sectional construction of the single extruded metal pieces that form the inner and outer vertically extending slideways on the inner side surfaces of the side members of the frame and the composite side bars on the sides of the sashes.

The window which is shown in the drawings constitutes the preferred form or embodiment of the invention. It is adapted to be fixedly mounted within an opening (not shown) in the wall of a building and comprises a rigid vertically elongated frame 7, a lower sash 8 and an upper sash 9. The frame 7 is rectangular and consists of a pair of vertically extending laterally spaced side members 10, a horizontally extending bottom member 11 and a horizontally extending top member 12. The side members 10 are held in fixed spaced relation by the bottom and top members 11 and 12 and are preferably formed of wooden boards. They embody on the side margins thereof inwardly extending wooden side strips 13 and have applied to their inner or opposed side surfaces vertically extending full height pieces 14 of extruded metal. The side strips 13 extend at right angles

to the side members **10** and have the outer side margins thereof fixedly secured to the side margins of the frame side members by nails, screws or other attaching devices (not shown). The pieces **14** of extruded metal are preferably formed of aluminum or magnesium in order that they are light in weight and are not capable of rusting. They fit between the vertically extending side strips **13** as shown in Figure 6 of the drawings and each consists of a pair of inwardly facing laterally spaced channels **15** and a vertically extending connecting web **16** between the two channels. Each channel consists of an intermediate leg **17** and a pair of side legs **18**. The intermediate legs **17** of the channels fit flatly against the inner side surfaces of the frame side members **10** and are fixedly secured in place by way of screws **19** which extend through holes in the intermediate legs and into said frame side members. The side legs **18** of the channels **15** are connected to the side margins of the intermediate legs **17**. They extend at right angles to the intermediate legs and away from the frame side members **10** and embody substantially midway between their side edges integral vertically extending flanges **20**. The latter project inwards from the side legs **18** and are the same in height as the channels **17**. The outermost side legs of the channel **17** fit flatly against the inner side surfaces of the wooden side strips **13**, and the innermost side legs are cross-connected and held in spaced relation by the connecting webs **16**. As shown in Figure 6 the side margins of the connecting webs are connected to the side margins of the innermost side legs that are farther from the intermediate legs **17**. The innermost channels **17** define vertically extending inner slideways **21** for the lower sash **8** and the outermost channels form vertically extending outer slideways **22** for the upper sash **9**. The horizontally extending bottom member **11** of the window frame **7** extends between, and is suitably connected to, the lower ends of the vertically extending laterally spaced side members **10**. It is preferably in the form of a wooden board and is arranged so that its ends underlie and support the lower ends of the extruded metal pieces **14**. The horizontally extending top member **12** of the frame **7** extends between and is suitably connected to the upper ends of the frame side members **10**. It is preferably in the form of a wooden board and is arranged so that its ends overlie the upper ends of the extruded metal pieces **14**.

The lower and upper sashes **8** and **9** of the window are laterally offset as best shown in Figures 1 and 6 and when normally positioned are located, respectively, in the inside and outside portions of the interior of the frame **7**. They consist of rectangular frame parts **23** and rectangular panes **24** of glass and as viewed in Figure 6 are adapted to cooperate with separate and independent composite vertically extending slide bar asseemblies **25** and **26** on their left and right hand sides respectively. The frame parts **23** of the two sashes are preferably formed of wood and embody in their inner marginal portions continuous outwardly facing rectangular grooves **23***a*. The glass panes **24** are shaped conformably to, and fit snugly within, the grooves **23***a* and are held in place by putty **23***b*. The slide bars **25** and **26** at the sides of the lower sash **8** fit slidably within the oppositely disposed inner slideways **21** and coact therewith to permit the lower sash to slide downwards into a closed position wherein it extends across the lower half portion of the frame interior and upwards into an open position wherein it extends across the upper half portion of the frame interior and exposes the lower half portion of said frame interior. The slide bars **25** and **26** at the sides of the upper sash **9** fit slidably in the opposed outer slideways **22** and coact therewith to permit the upper sash to slide upwards into a closed position wherein its extends across the upper half portion of the frame interior and downwards into an open position wherein it extends across the lower half portion of the interior of the frame and exposes the upper half portion of the frame interior.

The left hand slide bars **25** at the left hand sides of the lower and upper sashes **8** and **9** consist of channel-shaped inner parts **27** and outer parts **28** and are the same in height as the sash frame parts **23**. The channel-shaped inner parts **27** are formed of extruded aluminum or magnesium and consist of intermediate legs **29** and outwardly extending side legs **30**. The intermediate legs **29** of the channel-shaped inner parts **27** of the left hand slide bars **25** are spaced a small distance outwards from the left hand side surfaces of the sash frame parts **23** and embody integral inwardly extending L-shaped flanges **31** on their inner side margins and integral inwardly extending flat or straight flanges **32** on their outer side margins. The L-shaped flanges **31** abut against the inner left hand corner portions of the sash frame parts **23**, and the straight flanges **32** are positioned in lapped relation with the outer left hand corner portions of the sash frame parts **23** when the two sashes are in their normal position as shown in full lines in Figure 6. The channel-shaped inner parts **29** are connected to the inner left hand corner portions of the sash frame parts **23** by way of hinges **33**. The latter consist of outer hinge members **34**, inner hinge members **35** and vertically extending pivot pins **36**, and as shown in Figure 2, permit the two sashes to be swung inwards with respect to the window frame **7** in order that both sides of the panes **24** of glass may be readily washed or cleaned from the inside of the window as a whole. The outer hinge members **34** fit against the inner surfaces of the inner side margins of the intermediate legs **29** and are fixedly secured thereto by way of rivets **37**. The inner hinge members **35** of the hinges **33** fit against the inner portions of the left hand side surfaces of the sash frame parts **23** and are fixedly secured thereto by way of screws **38**. The vertically extending pivot pins **36** of the hinges **33** extend through vertically aligned tubular elements **39** on the inner side margins of the outer and inner hinge members **34** and **35** and are removable in order than the sashes may be bodily withdrawn from the frame for painting or other purposes. The spaces between the L-shaped flanges **31** and the straight flanges **32** are preferably filled with weather stripping **40** in order that the left hand side surfaces of the sash frame parts **23** are sealed when the two sashes are in their normal or operative position wherin they are disposed wholly within the window frame **7** as shown in full lines in Figure 6. The side legs **30** of the channel-shaped inner parts **27** of the left hand slide bars **25** are connected to, and extend outwards at right angles from, the side margins of the intermediate legs **27**. They extend into the channels **15** of the left hand extruded metal piece **14** and embody substantially midway between their side margins vertically extending grooves **41** in which fit slidably the inwardly extending flanges **20** on the side legs **18** of the channels of the left hand extruded metal piece **14**. The lower ends of the channel-shaped inner parts **27** are closed by bottom walls **42** and the upper ends of said inner parts are closed by way of top walls **43**. The bottom walls **42** extend horizontally and have the end and inner side marginal portions thereof suitably fixedly connected to the bottom edges of the side legs **30** and the intermediate legs **29**. The top walls **43** (see Figure 3) extend horizontally and have their end and inner side marginal portions fixedly connected in any suitable manner to the top edges of the side legs **30** and the intermediate legs **29**. The outer parts **28** of the left hand slide bars **25** are in the form of vertically extending wooden strips and fit loosely within the extruded metal channel-shaped inner parts **27** to the end that they are free to move laterally relatively to said inner parts. The outer surfaces of the wooden outer parts **28** are flat and fit slidably against the intermediate webs **17** of the channels **15** of the left hand extruded metal piece **14**. The inner sur-

faces of the inner parts 28, i. e., the surfaces that are disposed opposite to the intermediate legs 29 of the channel-shaped inner parts 27 are provided with longitudinally extending grooves 44. The ends of the outer parts 28 abut against the horizontally extending bottom walls 42 and top walls 43 and coact therewith so as to hold said outer parts against longitudinal displacement with respect to the channel-shaped inner parts 27. Arcuate leaf springs 45 are disposed between the outer parts 28 and the intermediate legs 29 of the channel-shaped inner parts 27 and operate to urge the wooden outer parts outwards in order that they grip frictionally the intermediate legs 17 of the channels 15 of the left hand extruded metal piece 14 and thus serve to hold the two sashes in the various positions into which they are slid. Preferably, there are two leaf springs 45 for each of the wooden outer parts 28 and they are located or positioned as shown in Figure 3. The ends of the leaf springs 45 are disposed in the grooves 44 in the inner surfaces of the wooden outer parts 28. The central portions of the leaf springs are bowed in the direction of the intermediate legs 29 of the extruded metal channel-shaped inner parts 27, are provided with screw threaded holes 46, and have associated therewith horizontally extending screws 47 for adjusting the amount of compression of the springs 45. The right hand ends of the adjusting screws as viewed in Figures 3 and 6 are plain, fit rotatably in circular holes 48 in the intermediate legs 29 of the channel-shaped inner parts 27 and are provided with kerfs 49 so that the screws may be turned by way of a screwdriver. The central portions of the adjusting screws 47 are provided with integral enlargements 50 which abut against the portions of the intermediate legs 29 that define the holes 48, and coact therewith so as to prevent longitudinal displacement of the adjusting screws 47 in a direction away from the wooden outer parts 28. The left hand ends of the adjusting screws as viewed in Figures 3 and 6 embody external or male screw threads and fit within the screw threaded holes 46 in the central portions of the arcuate leaf springs 45. When the adjusting screws 47 are turned in one direction they serve to deflect the central portions of the leaf springs in the direction of the outer parts 28 and thus place such springs under increased compression. Reverse turning of the adjusting screws 47 results in increased bowing of the leaf springs and resultant decrease in the amount of compression of said springs. The kerf-equipped right hand ends of the adjusting screws 47 are accessible for screw turning purposes when the two sashes are swung inwards with respect to the window frame 7 as shown in full lines in Figure 2 and dotted lines in Figure 6. The leaf springs 45 not only urge the wooden outer parts 28 outwards but also urge the inner parts 27 inwards and thus cause the groove defining intermediate portions of the side legs 30 to grip tightly as well as slidably the flanges 20 to the end that air is prevented from flowing around the left hand slide bars 25.

The separately formed composite right hand slide bars 26 at the right hand sides of the lower and upper sashes 8 and 9 consist of channel-shaped inner parts 50 and outer parts 51 and are the same in height as the sash frame parts 23. The inner parts 50 are formed of extruded aluminum, magnesium or any other similar material and consists of intermediate legs 52 and outwardly extending side legs 53. The intermediate legs 52 are spaced a small distance outwards from the right hand side surfaces of the sash frame parts 23 and embody integral inwardly extending L-shaped flanges 54 on their inner side margins and integral inwardly extending flat or straight flanges 55 on their outer side margins. When the two sashes 8 and 9 are in their normal or operative position the L-shaped flanges 54 abut against the inner right hand corner portions of the sash frame parts 23 and the straight flanges 55 are positioned in lapped relation with the outer right hand corner portions of the sash frame parts 23 as shown in Figure 6. The right hand side edges of the sash frame parts 23 are beveled outwards to a small extent so as to permit the two sashes in connection with inward swinging thereof with respect to the frame 7 to move readily away from the right hand slide bars 26. The spaces between the L-shaped flanges 54 and the straight flanges 55 are filled with weather stripping 56 in order that the right hand side surfaces of the sash frame parts 23 are sealed when the two sashes are in their normal or operative position wherein they are disposed within the window frame 7. The side legs 53 of the channel-shaped inner parts 50 of the right hand slide bars 26 are connected to, and extend outwards at right angles from, the side margins of the intermediate legs 52. They extend into the channels 15 of the right hand extruded metal piece and embody substantially midway between their side margins vertically extending grooves 57 in which fit slidably the inwardly extending flanges 20 or tongues on the side legs 18 of the channels of the right hand extruded metal piece 14. The lower ends of the channel-shaped inner parts 50 are closed by bottom walls 58 and the upper ends of said inner parts are closed by top walls 59. The bottom walls 58 extend horizontally and have the end and inner side marginal portions thereof suitably fixedly connected to the bottom edges of the side legs 53 and the intermediate legs 52. The outer parts 51 of the right hand slide bars 26 are in the form of vertically extending wooden strips and fit loosely within the extruded metal channel-shaped inner parts 50 to the end that they are free to move laterally relatively to said inner parts. The outer surfaces of the wooden outer parts 51 are flat and fit slidably against the intermediate webs 17 of the channels of the right hand extruded metal piece 14. The wooden outer parts 51 are urged outwards by spiral compression springs 60 in order that they grip frictionally the intermediate legs 17 of the channels 15 of the right hand extruded metal piece 14 and thus serve frictionally to hold the sashes in the various positions in which they are slid. Preferably, there are two spiral compression springs 60 for each of the wooden outer pieces 51 and they are located or positioned as shown in Figure 3. The inner ends of the springs 60 abut against the intermediate legs 52 of the channel-shaped inner parts 50 and the outer end portions of said springs are disposed in bores 61 in the ends of the end portions of the wooden outer parts 51 of the right hand slide bars 26. The spiral compression springs 60 not only urge the wooden outer parts 51 outwards but also urge the inner parts 50 inwards and thus cause the groove defining intermediate portions of the side legs 53 to grip tightly as well as slidably the flanges 57 to the end that air is prevented from flowing around the right hand bars 26.

The lower and upper sashes 8 and 9 are adapted to cooperate with releasable locking bolt assemblies 62 which, when in their locking position, serve fixedly to connect the sashes to their right hand slide bars 26 and when in their unlocked position free the sashes so that they may be swung inwards with respect to the window frame 7 and said right hand slide bars. As best shown in Figure 3 the locking bolt assembly for the lower sash 8 is located at the upper end of the right hand slide bar 26 for the lower sash and the locking bolt assembly 62 for the upper sash 9 is located at the lower end of the right hand slide bar for the upper sash. As shown in detail in Figures 4 and 5, the assemblies 62 comprise horizontally extending locking bolts proper on pins 63. The latter are mounted in sleeves 64 for sliding movement towards and away from the two sashes. The sleeves 64 extend horizontally and are disposed in oversized notches 65 in the end portions of the wooden outer parts 51 of the right hand slide bars. The inner ends of the sleeves 64 fit snugly within circular holes 66 in the intermediate legs 52 of the extruded metal channel-shaped inner parts 50 and, when the two sashes are in their nor-

mal or operative position wherein they are disposed within the frames 7, are in alignment with sockets 67 in the adjacent corner portions of the sash frame parts 23. When the pins 63 are slid to the left as viewed in Figures 3 to 6, inclusive, and so that the ends thereof that are nearer the two sashes are disposed in the sockets 67, the sashes are held in fixedly connected relation with the right hand slide bars 26. When the pins are slid to the right into a retracted position wherein their outer ends are withdrawn from the sockets 67, the sashes 8 and 9 are released so that they may be swung inwards with respect to the frame 7 and the right hand slide bars 26. Back and forth sliding movement of the pins 63 is effected by centrally fulcrummed levers 68. The lever associated with the lower panel 8 has the central portion thereof disposed in a slot 69 in the top wall 59 of the channel-shaped inner part of the right hand slide bar for the lower sash and mounted on a horizontal pivot pin 70. The lower end of said lever (see Figure 5) extends through a slot 71 in the sleeve 64 into a notch 72 in the pin associated with the lower sash 8. The upper end of said lever is exposed and forms a andle whereby the lever may be swung back and forth in connection with back and forth sliding movement of the pin. The lever for shifting back and forth the pin associated with the upper sash is mounted and arranged in the same manner as the lever for the pin associated with the lower sash 8 except that it is reversely positioned. When the two sashes are in their closed position as shown in Figure 3 the outer ends of the sleeves 64, i. e., the ends of the sleeves that are farther from the sashes register with holes 73 in the intermediate legs 17 of the channels 15 of the right hand extruded metal piece 14 and also aligned sockets 74 in the right hand side member 10 of the frame. The holes 73 and the sockets 74 are adapted to receive the outer ends of the pins 63 when the pins are in their retracted position. In view of the fact that the holes 73 and the sockets 74 are only in registry with the outer ends of the sleeves 64 when the sashes are in their closed position, the pins 62 can be shifted into their position of release only when the sashes are in their closed position.

The lower end of the L-shaped flange 54 on the channel-shaped inner part 50 of the right hand slide bar for the lower sash 8 is provided with a laterally extending bracket-type locking device 75 (see Figure 3) which when the lower sash is in complete registry with its right hand slide bar laps the lower right hand corner of the lower sash and thus prevents the lower sash from being swung inwards even though the pin is in its position of release. The upper end of the L-shaped flange 54 on the channel-shaped inner part 50 of the right hand slide bar for the upper sash 9 is provided with a laterally extending bracket-type locking device 76 (see Figure 3) which when the upper sash is in complete registry with its right hand slide bar 26 laps the upper right hand corner of the upper sash and thus prevents the upper sash from being swung inwards even though the pin is in its position of release.

When it is desired to swing the lower sash 8 inwards for pane washing purposes, such sash is slid downwards into its fully closed position and then the pin associated with the lower sash is shifted into its position of release. When the pin is in such position, it prevents upward sliding movement of the right hand slide bar 26 for the lower sash. After releasing the lower sash such sash is slid upwards independently of its right hand slide bar in order to disengage its lower right hand corner from the locking device 75. After such upward sliding movement of the lower sash, such sash is free so that it may be swung inwards as shown in Figure 2. The upper sash can only be swung inwards after inward swinging of the lower sash. When it is desired to swing inwards the upper sash 9, such sash is slid upwards into its fully closed position and then the pin is shifted to its position of release whereby it prevents downward sliding movement of the right hand slide bar for the upper sash. After releasing the upper sash the same is slid downwards relatively to its right hand slide bar in order to disengage its upper right hand corner from the locking device 76. As soon as the upper sash 9 is disengaged from the locking device 76, it is free so that it may be swung inwards as shown in Figure 2.



The herein described window due to its particular construction and arrangement of parts effectively and efficiently fulfills its intended purpose and is characterized by the fact that the upper and lower sashes thereof may be swung inwards so that the panes of glass thereof may be readily washed from the inside of the window as a whole. By including the arcuate leaf springs 45 and the spiral compression springs 60, the two sashes will remain in the various positions into which they are slid without the use of conventional sheave and sash weight arrangements. By arranging or constructing the locking bolt assemblies 62 as hereinbefore described, the sashes are locked against release for subsequent inward swinging except when they are in their fully closed position.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A window structure adapted to be mounted in an opening of a wall of a building and comprising a rigid upstanding rectangular frame consisting of spaced apart side members, a sill-forming bottom member between the lower ends of the side members, and a top member between the upper ends of said side members, a pair of elongated vertically extending pieces mounted on, and extending throughout the length of, the inner side surfaces of the frame side members respectively and shaped to form spaced apart inside and outside inwardly facing opposed slideways, a lower sash disposed normally in the inner portion of the interior of the frame and provided at the opposite sides thereof with composite vertically extending slide bars which fit slidably in the opposed inner slideways so that the lower sash may be raised and lowered, said composite slide bars consisting of channel-shaped inner parts and laterally movable outer parts nested within the inner parts, and embodying spring means between their inner and outer parts for urging the outer parts outwards into such frictional engagement with the respective opposed inner slideways that they serve frictionally to hold the inner sash in the various positions into which it is raised or lowered, means releasably securing one side of said lower sash to the inner part of its adjacent composite slide bar, means hingedly securing the other side of said lower sash to the inner part of its adjacent composite slide bar, an upper sash disposed normally in the outer portion of the frame interior and provided at the opposite sides thereof with composite vertically extending slide bars which fit slidably in the opposed outer slideways so that the upper sash may be lowered and raised, said latter composite slide bars consisting of channel-shaped inner parts and laterally movable outer parts nested within the inner parts, and embodying spring means between their inner and outer parts for urging the outer parts outwards into such frictional engagement with the respective opposed outer slideways that they serve frictionally to hold the upper sash in the various positions into which it is lowered or raised, means releasably securing one side of said upper sash to the inner part of its adjacent composite slide bar, and means hingedly securing the other side of said upper sash to the inner part of its adjacent composite slide bar.

2. A window structure according to claim 1 and in which the vertically extending slideway-forming pieces are formed of single pieces of extruded light weight metal and consist of spaced apart inwardly facing inside

and outside channels and integral connecting webs between the adjacent channel edges, the channel-shaped inner parts of the slide bars for the two sashes being formed of single pieces of extruded light weight metal and having the side legs thereof disposed between and confined within the side legs of the channels of the slideway-forming pieces, and interlocking tongue and groove means on said side legs of the channel shaped inner parts and the confining side legs therefor for retaining the inner parts within the respective channels of the slideway forming pieces.

3. A window structure according to claim 1 and in which the spring means of the composite slide bars that are at one side of the two sashes are in the form of arcuate leaf springs and have associated therewith compression adjusting screws which have certain ends thereof in engagement with the central portions of the leaf springs and their other ends extending through holes in the intermediate legs of the inner parts of the composite slide bars on said one side of the two sashes.

4. A window structure according to claim 3 and in which the spring means of the slide bars at the other side of the two sashes are in the form of spiral compression springs certain ends of which abut against the intermediate legs of the channel-shaped inner parts of said slide bars and the other ends of which are disposed in bores in the outer parts of said side bars.

5. A window structure according to claim 1 wherein the means for hingedly securing the upper and lower sashes to the inner parts of the respective composite slide bars are disposed on the same side of said wall opening.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 389,646 | Gunniss | Sept. 18, 1888 |
| 998,464 | Cannon | July 18, 1911 |
| 1,072,071 | Banger et al. | Sept. 2, 1913 |
| 1,542,373 | Coupland | June 16, 1925 |
| 1,976,888 | Muik | Oct. 16, 1934 |
| 2,638,639 | Carter | May 19, 1953 |
| 2,696,645 | Edmonds | Dec. 14, 1954 |
| 2,735,145 | Kraesky | Feb. 21, 1956 |