

July 21, 1931.

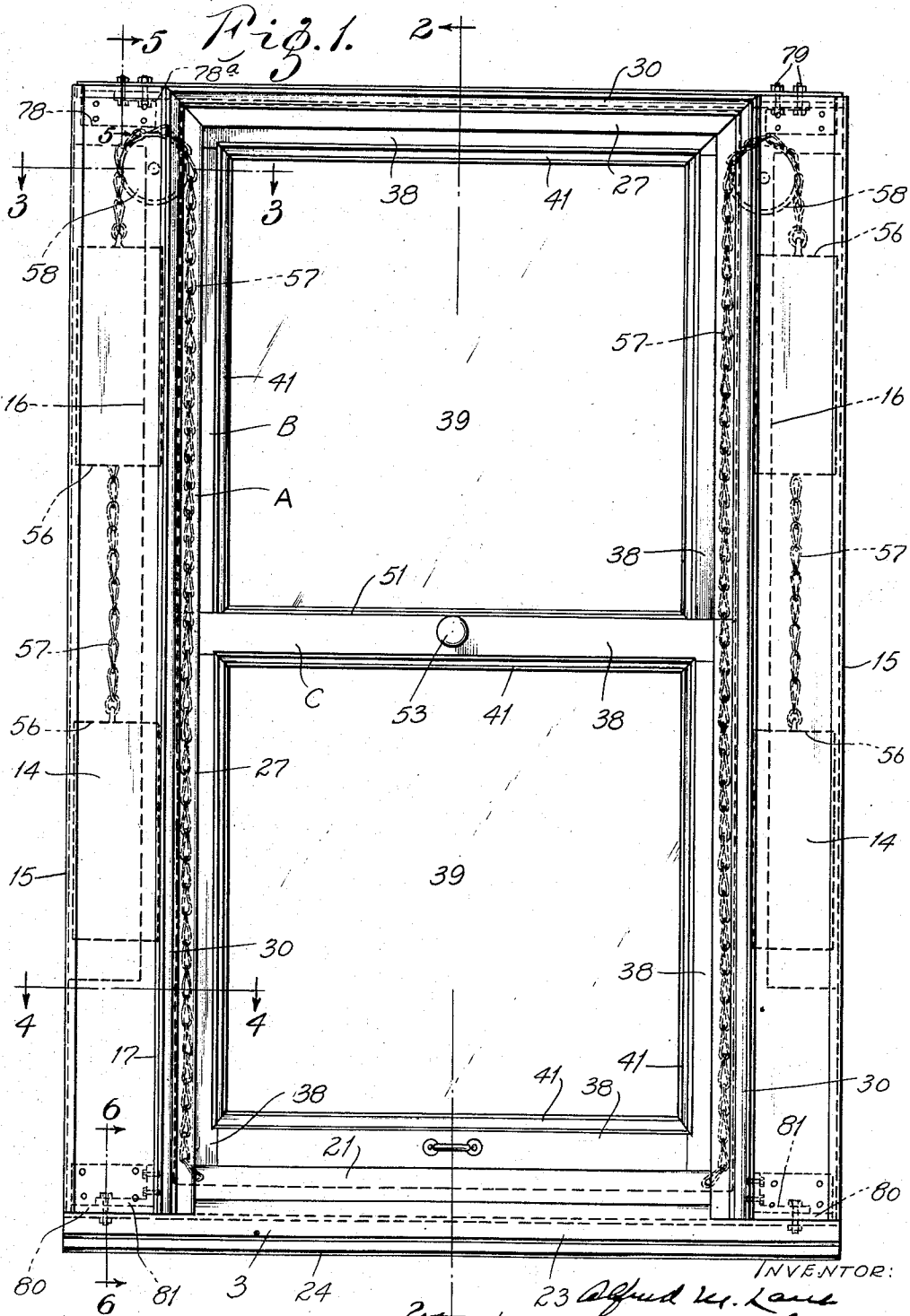
A. M. LANE

1,815,718

METAL WINDOW

Filed Nov. 26, 1928

3 Sheets-Sheet 1



INVENTOR:

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HIS ATTORNEYS

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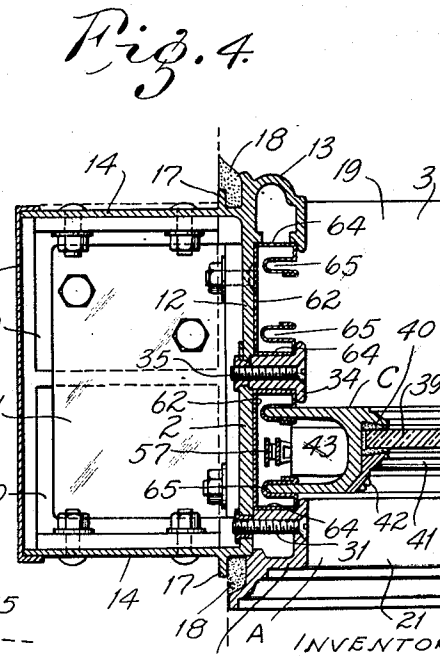
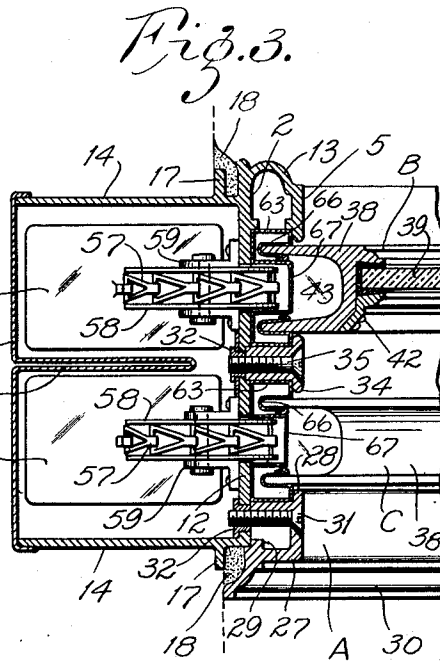
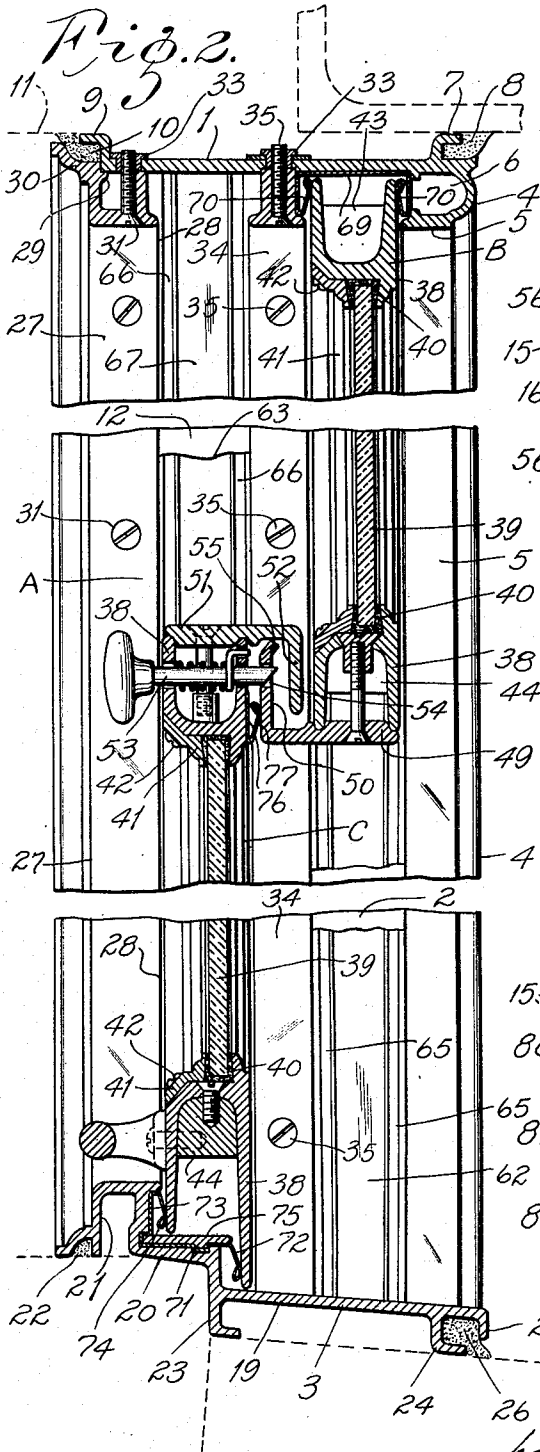
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METAL WINDOW

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3 Sheets-Sheet 2



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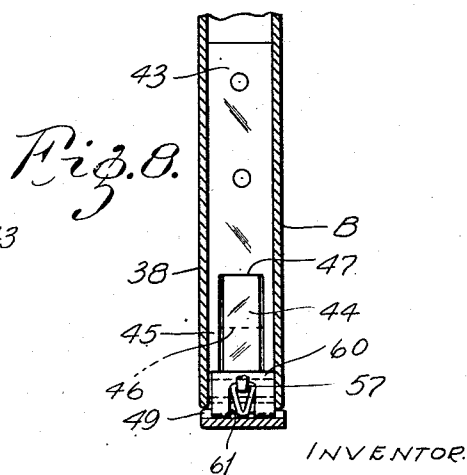
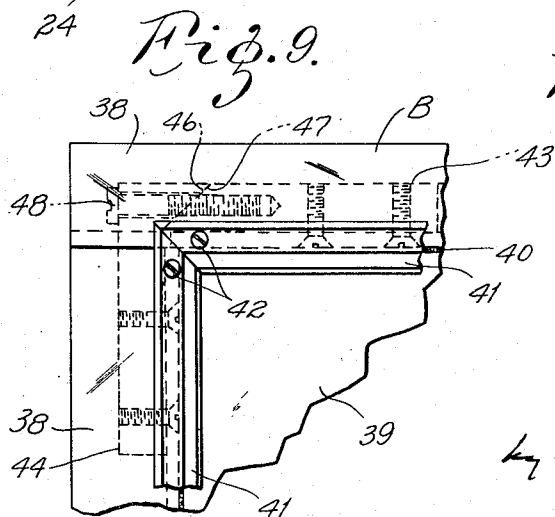
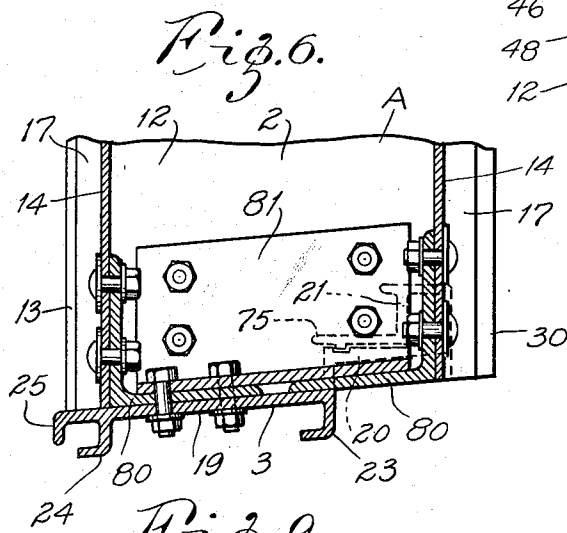
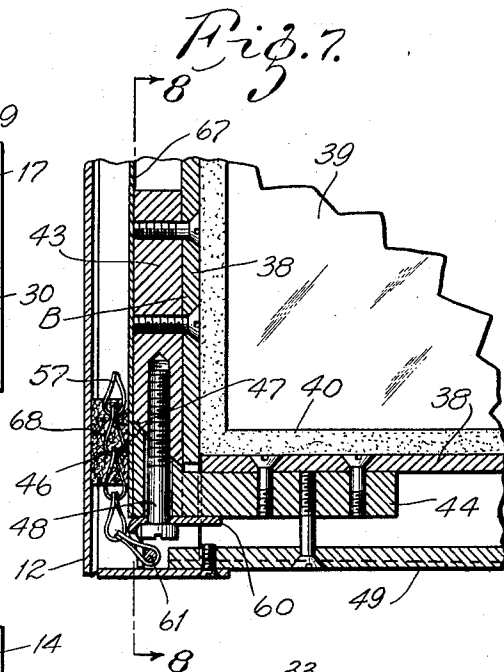
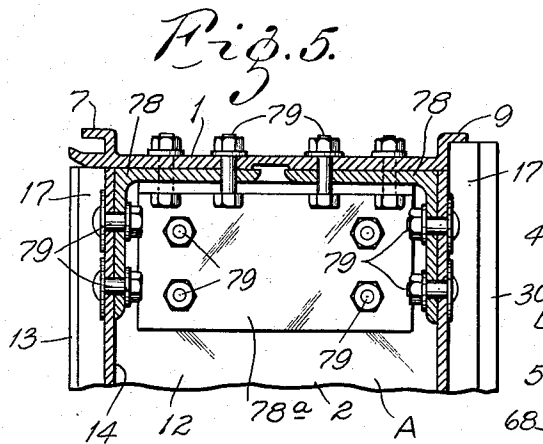
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

ALFRED M. LANE, OF ST. LOUIS, MISSOURI

METAL WINDOW

Application filed November 26, 1928. Serial No. 321,828.

This invention relates principally to metal windows equipped with sliding sashes and weatherstrips. It has for its principal objects to produce a strong, durable and lightweight window construction of pleasing appearance; to simplify and cheapen the construction and operation of assembling the window; to provide weatherstrips for the window which can be quickly and easily applied without any alteration of the window; to conceal the sash chains and pulleys; to assure an easy movement of the sashes when the sashes or frame expands or contracts due to temperature changes; and to obtain other advantages hereinafter appearing. The invention consists in the construction, combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is an interior side view of a metal window construction embodying my invention;

Fig. 2 is an enlarged vertical section through said window on the line 2—2 in Fig. 1;

Fig. 3 is a horizontal cross-section through one side of the window, the section being taken above the meeting rails of the sashes on line 3—3 of Fig. 1;

Fig. 4 is a horizontal cross-section through the same side of the window, the section being taken below the meeting rails of the sash on the line 4—4 in Fig. 1;

Fig. 5 is a vertical cross-section through one of the upper corner portions of the window frame on the line 5—5 in Fig. 1, showing the manner of securing the upper ends of the jamb members to the head member;

Fig. 6 is a vertical section through one of the lower corner portions of the window frame on the line 6—6 of Fig. 1, showing the

manner of securing the lower ends of the jamb members to the sill member;

Fig. 7 is a vertical section through one of the lower corner portions of the upper sash, showing the arrangement for securing together the adjacent ends of the side and bottom rails of said sash;

Fig. 8 is a vertical section through the lower portion of the side rail of the upper sash on the line 8—8 in Fig. 7;

Fig. 9 is an interior side view of one of the upper corner portions of the upper sash; and

Fig. 10 is a perspective view of one of the hardened steel bushings for the fastening screws which secure together the different parts of the window.

The present double-hung metal window construction comprises a window casing or frame A arranged for vertical sliding upper and lower sashes B and C, respectively. The window casing or frame A comprises a head member 1, two jamb members 2 and a sill member 3. The head member 1 comprises a metal member having a substantially flat main body portion provided along its outside edge with a depending ornamental molding 4 which constitutes the inside stop for the top rail of the upper sash B. The combined ornamental molding and stop 4 is provided on its underside with a flat face 5 to which a screen slide (not shown) may be bolted. The ornamental stop is made hollow and is provided along its inner wall with an opening 6 whereby access may be had to the interior of said stop, thereby permitting the nuts of the securing bolts to be readily inserted within and removed from the recess in the hollow stops. The head member 1 is also provided along its outside margin with an upwardly and outwardly extending top flange 7 which forms a key for a suitable caulking material 8 for sealing the joint between the outside edge of the head member and brickwork located thereabove. The inside edge of the head member is also provided with an up-

standing flange 9, similar to the outside flange 7 thereof, which constitutes a seat for caulking material 10 and a guide for fixing the lower face of the plaster 11.

Each of the metal jamb members 2 of the window frame comprises a substantially flat main body portion 12 provided at its outside margin with a hollow inwardly extending ornamental molding 13, which is similar to the outside molding 4 of the head member and constitutes the inside stop for the adjacent side rail of the upper sash B and a seat for a screen slide. Each jamb member 2 is also provided adjacent to its inside and outside edges with longitudinally extending flanges which project from the outer face of the main body portion of the jamb and form the side walls of a sash weight box. The outer wall of the sash weight box is formed by a sheet metal cover plate 15 which is provided midway of the side walls 14 of said box with an inwardly extending rib 16 which divides the box in two compartments. The flanges 14 of the jamb member which form the side walls of the sash pulley box are each provided adjacent to the main body portion of said jamb member with an outstanding rib or flange 17 which extends parallel to the body portion of the jamb member but is spaced therefrom far enough to form a key for caulking material 18. The flanges 17 also serve as guides for locating the inner faces of the brickwork or plaster at the sides of the window frame.

The sill member 3 of the window frame comprises a main body portion 19, which slopes downwardly towards the outer edge of the window frame to provide for drainage, an upwardly offset portion 20 located below the lower sash, and an inside marginal portion offset above said last mentioned offset portion to form a hollow ornamental rib or molding 21 which constitutes an outside stop for the bottom rail of the lower sash. As shown in the drawings, the rib 21 is provided at the inside edge of the sill member with a key for caulking material 22; and the inclined body portion 19 of said sill member is provided along its inside margin with a supporting flange 23 and along its outside margin with a supporting flange 24, which cooperates with a depending flange 25 on the outside edge of said body portion to form a key for caulking material 26.

Each of the jamb members 2 of the window frame A is provided with an inside molding or stop 27 comprising a metal strip of substantially channel-shaped cross-section arranged with its inner side flange in abutting relation to the flat main body portion of the jamb and having its web portion extended inwardly beyond the inner face of said inner flange to form an overhanging flange portion 28. The outer flange of the inside stop 27 is provided with an inwardly extending lateral flange adapted to form a shoulder

29 which bears against the inside edge of the main body portion of the jamb member. The marginal portion of the outer flange of the inside stop is flared outwardly to form an ornamental molding 30 adapted to conceal the caulking material 18. The inside stop 27 is secured to the jamb member 2 by screws 31, which extend horizontally through openings provided therefor in the web of said stop and are threaded through the threaded bores of bushings 32 that have a drive fit in openings provided therefor in the main body portion of said jamb. The bushings 32 are provided at one end with stop collars or flanges 33, which bear against the outer face of the jamb; and the exterior surfaces of the cylindrical body portions of said bushings are knurled or otherwise roughened to retain them within the openings in which they are driven. Each of the jamb members is also provided with a parting strip 34 of substantially T-shaped section which is arranged with its web seated in a groove or channel provided therefor in the inner surface of the main body portion of the jamb member and with its side or head flanges spaced inwardly from said jamb in the plane of the inner faces of the inside and outside stops 13 and 27, respectively, thereof. The parting strip is secured to the jamb member by means of screws 35 which pass through the web portion of said strip and are threaded into the threaded bores of knurled bushings 32 similar to the bushings for the fastening screws 31 for the inside stops 27. The inside stop 36 and parting strips for the head member 1 of the window frame A are of the same size and shape as the inside stops 27 for the jamb members 2; and likewise, the parting strip 37 for said head member has the same size and shape as the parting strips 34 for said jamb member. The parting strips 34 and the inside stops for the head member are secured to the head member in the same manner in which the parting strips and stops for the jamb members are secured thereto.

The metal frame members 38, which form the top, bottom and side rails of the upper and lower sashes, are of substantially channel-shaped section, each of these members comprising side marginal flanges connected by a web which is provided along its upper corner with a flange or abutment which forms a seat for the window pane 39. The pane 39 is set in putty 40 that is held in position by means of glazing strips 41 which fit the inner edges of the sash frame members 38 with one flange in abutting relation to the inner face of said pane. The glazing strips 41 are removably secured to the frame members of the sashes by means of screws 42. At the corners of the sashes the adjacent ends of the channel-shaped frame members 38 are disposed in overlapped relation;

that is, the end portion of one frame member extends across the adjacent end of the other frame member. The overlapped end portions of the frame members are rigidly secured together at each corner of each sash by means of two cooperating clamping blocks 43 and 44, respectively, mounted in the channels of said frame members and rigidly secured flatwise to the web thereof by means of screws.

As shown in Figs. 7 and 8 of the drawings, the lower portion of the side rail of the upper sash extends across the adjacent end of the bottom rail thereof and has its web portion cut away opposite the channels in said bottom rail. A block 43 is secured within the channel of the side rail and has a bifurcated lower end portion 45 disposed opposite the end of the channel in the bottom rail. A block 44 is mounted in the channel of the bottom rail with its outer end projecting beyond the end of said rail and entered within the bifurcated lower end of the block 43 in the side rail. The portion of the block 44 that is straddled by the bifurcated lower end of the block 43 has a beveled upper surface 46 which slopes inwardly and downwardly from the outer end of said block, and cooperates with a similarly beveled surface 47 on the portion of the block 43 located thereabove. A screw 48 extends loosely through a vertical hole provided therefor in the beveled end of the block 44 and is threaded into the block 43 located thereabove. With this arrangement of corner connection, tightening of the screw 48 causes the beveled faces of the two blocks to be slid one on the other and thus draw together the overlapped ends of the vertical and horizontal rails of the sash.

The frame member, which forms the lower rail of the upper sash B, has its bottom closed by means of a plate 49 which is provided along its inside margin with an upstanding flange 50; and likewise, the top of the frame member, which forms the top rail of the lower sash C, is closed by means of a cover plate 51, which is provided along its outside margin with a downwardly extending flange 52 adapted to overlap the upstanding flange 50 on the cover plate 49 for the bottom rail of the upper sash in the closed position of said sashes.

The window is provided with a latch for automatically locking the sashes B and C in closed position. As shown in Fig. 2 of the drawings, said latch comprises a spring-pressed bolt 53 which is slidable in aligned openings in the side flanges of the top rail of the lower sash and has a beveled inner end portion adapted to enter an opening 54 provided therefor in the upstanding inner flange 50 of the bottom closure plate 49 for the lower rail of the upper sash in the closed position of the two sashes. During the closing

movement of the sashes the beveled end of the locking bolt 53 engages a beveled surface 55 at the upper end of the upstanding inner flange 50 of the closure plate 49 for the bottom rail of the upper sash and is thus slid inwardly against the pressure of the spring to a position whereby it may be automatically engaged with the hole 54 provided therefor in said flange when the sashes are closed.

Located within the metal boxes formed by the flanges 14 of the jamb members 2 and the sheet metal cover plates 15 are sash weights 56 for counterbalancing the weight of the sliding sashes B and C. The sash weights 56 are suspended in the boxes by means of sash chains, cords or ribbons 57, which pass over pulleys 58 journaled in brackets 59 mounted on the jamb members, through openings provided therefor in said jamb members, and thence downwardly in the runways formed by the parting strips and inside and outside stops to the sashes. As shown in Fig. 7 of the drawings, the sash weight chains for the upper sash extend downwardly through the channels in the side rails thereof and are attached to the lower corners of the sash by inserting the endmost link of the chain in a notch provided therefor in the depending flange of a bracket 60 which is secured to the clamping block 44 of the bottom rail of the sash by means of the adjusting screw therefor, and by passing a pin 61 through said link to prevent the same from being drawn out of said notch. The chains for the lower sash may be secured to the upper corners thereof in a similar manner.

In order to prevent leakage of air and dust between the jambs of the window frame and the side rails of the sashes, metal weatherstrips 62 and 63 are mounted in the jambs between the parting strips and the inside and outside stops. As shown in the drawings, the strips have a snug fit between the opposing walls of the parting strip and stops and are held against the panes by the overhanging flanges at the side edges of said parting strip and stops. The weatherstrips 62 extend from the sill of the window frame to a point opposite the meeting rails of the closed sashes; and the strips 63 extend from the upper ends of the strips 62 to the head of said window frame. Each of the strips 62 preferably comprises a web portion, which bears flatwise against the inner face of the jamb between the stops and the parting strip, and outstanding side marginal flanges 64, which bear against the opposing side faces of said parting strip and stops and are bent inwardly towards each other, thence inwardly towards said web and thence outwardly to form longitudinal grooves or slideways 65 adapted to slidably receive the side flanges of the channel-shaped side rails of the sashes. Each of the weatherstrips 63 is also of channel-shaped cross-section and has its side

flanges bent to form grooves or slideways 66 for the side flanges of the side rails of the sashes. The web of the strips 63, however, are pressed out between the slideways 66 to form a longitudinal channel 67 adapted to straddle the sash chain. As shown in the drawings, the exposed portions of the sash chains for the lower sash are concealed by means of the longitudinal channels 67 of the strips 63. The channels 67 of the strips 63 for the upper sash also straddle the chains therefor, and serve to conceal the same when said sash is lowered. Outside air is prevented from entering the room through the lower ends of the channels 67 of the strips for the upper sash by means of felt plugs 68, which are sleeved on the lower end of the sash chains and completely close the lower ends of said channels.

The joint between the top rail of the upper sash B and the head member 1 of the window frame A is sealed by means of a channel-shaped metal weatherstrip 69 arranged between the parting strip and the outside stop with its web portion bearing flatwise against the bottom of the head member and with its side flanges bearing against the opposing faces of said parting strip and said outside stop. As shown in the drawings, the side flanges of the head strip 69 are doubled-back on the inside of the channel to form resilient sealing flanges 70 adapted to bear against the respective inside and outside faces of the top rail of the upper sash in the closed position thereof.

The joint between the bottom rail of the lower sash C and the sill member 3 of the window frame A is sealed by means of a metal weatherstrip 71 comprising a web portion, which rests on the upwardly offset portion 20 of said sill and is provided along its outside margin with a depending sealing flange 72 adapted to bear against the inner face of the outside flange of the channel-shaped bottom rail of the lower sash in the closed position therefor. The inside margin of the sill strip 71 is provided with an upstanding flange 73, which bears against the outside face of the inside stop 21 of the sill and is thence rebent downwardly and spaced far enough away from the outstanding flange to form a resilient sealing flange 74, which bears against the inside face of the inside flange of the channel-shaped bottom rail of the lower sash in closed position thereof. The web portion of the sill strip is firmly clamped down upon the upwardly offset portion 20 of the sill by means of a clamping plate 75 secured in position by screws.

The joint between the meeting rails of the upper and lower sashes is made weatherproof and dustproof by means of a metal weatherstrip 76 comprising a flat body portion which is secured to the outside face of the upstanding outside flange of the channel-shaped

upper rail of the lower sash and has a rebent or doubled-back portion which forms a resilient sealing flange 77 adapted to bear against the upstanding flange 50 along the inside edge of the closure plate 49 for the bottom rail of the upper sash.

The head member 1 extends across the upper ends of the jamb members 2 and serves to close the upper ends of the sash weight boxes. The adjacent end portions of the head and jamb members are rigidly secured together by means of angles 78 having one flange secured to the side flanges 14 of the jamb members and the other flange secured to the underside of the head member. The adjacent ends of the head and jamb members are further secured together by means of an angle 78^a of one flange bolted flatwise to the main body portion of the jamb and the other flange secured to the top flanges of the two side angles 78 by means of bolts 79 passing through said flanges and said head member. The sill member 3 extends beneath the lower ends of the jamb members 2 and closes the lower ends of the sash weight boxes. The adjacent end portions of the sill and jamb members are secured together by angles 80 having one flange secured to the side flanges 14 of the jambs and the other flange secured to the sloping body portion of the sill. The jambs and sill members are further secured by means of an angle 81 having one flange bolted to the main body portion of the jamb and the other flange resting on the two side angles 80 and secured to the sill member.

The hereinbefore described weather-stripped metal window has numerous advantages. It reduces to a minimum the infiltration of air through the window; and it also serves to conceal the sash pulleys and chains. It utilizes a maximum number of frame members of the same cross-sectional size and shape, thereby reducing to a minimum the number of specially formed frame members required for the window; and it provides a rigid corner construction for the sashes. It provides a caulking key that is continuous throughout the sides, head and sill of the window frame, and it enables the head and jamb strips to be attached to the window without the use of fastening devices, such as bolts and screws. It is noted as an important advantage of the foregoing construction that the jamb strips, in addition to performing the functions of a weatherstrip, serve also to conceal the sash chains and pulleys and constitute yieldable slideways for said sashes.

Obviously, the construction hereinbefore described admits of considerable modification; therefore, I do not wish to be limited to the precise arrangement shown and described.

What I claim is:

1. A metal window framing member com-

prising a body portion provided along one margin with an integral molding constituting a stop for a sash, said molding being hollow and having an opening in the sash opposing wall thereof communicating with the hollow therein.

2. A metal window framing member comprising a body portion provided along one margin with an integral molding constituting a stop for a sash, said molding being hollow and being provided with a flat face adapted to constitute a seat for a screen slide, the sash opposing wall of said hollow molding being provided with an opening which extends longitudinally of said member from end to end thereof and communicating with the hollow therein.

3. A metal window framing member comprising a main body portion provided along its inner and outer side margins with a recess for caulking material, the outer wall of said recess constituting guides for locating the inner face of adjacent brick work.

4. A metal window frame comprising jamb members provided with stops, said stops being hollow and having openings in their sash opposing faces whereby access may be had to the interior of said stops through said openings.

5. A jamb member for a metal window frame, said jamb member comprising a main body portion provided with outstanding side marginal flanges adapted to constitute the entire inside and outside walls of a sash weight box, and a sheet metal cover plate secured to said flanges and forming the back of the sash weight box, said cover plate being provided with an inwardly extending rib which divides said box into two compartments.

6. A jamb member for a metal window frame, said jamb member comprising a main body portion provided with outstanding side marginal flanges adapted to constitute the inside and outside walls of a sash weight box, said flanges being provided adjacent to the main body portion of said jamb member with outstanding flanges or ribs that extend longitudinally of said jamb member from end to end thereof and are spaced far enough from the main body portion thereof to form recesses for caulking material and to constitute guides for locating the inner face of brick work located on opposite sides of said jamb member.

7. A window frame comprising metal head and jamb members whose inside marginal portions are offset to form a recess for caulking material and a guide for locating the inner edge of brick work located adjacent thereto, and stops secured to the inside marginal portions of said head and jamb members and having a flange portion adapted to conceal said caulking material.

8. A window frame comprising metal members secured together by screws, said screws passing through one of said members

and being threaded into a threaded bore provided therefor in a bushing having a drive fit in an opening provided therefor in said other member.

9. A window frame comprising metal members secured together by screws, said screws passing through one of said members and being threaded into a threaded bore provided therefor in a bushing having a drive fit in an opening provided therefor in said other member, said bushing being provided with a knurled body portion adapted to engage the wall of the hole in which it is driven and having a flanged portion adapted to bear against the face of said frame member.

10. A window construction comprising a window frame provided with a parting strip and inside and outside stops, metal weatherstrips located between the opposing faces of said parting strip and said inside and outside stops, each of said weatherstrips being provided with outwardly opening grooves, and sashes having side marginal flanges slidably engaging said grooves.

11. A window construction comprising a window frame provided with a parting strip and inside and outside stops, metal weatherstrips located between the opposing faces of said parting strip and said inside and outside stops, each of said weatherstrips being of substantially channel-shaped cross-section and having their side marginal flanges bent to form outwardly opening grooves, and sashes having side marginal flanges engaging said grooves, said parting strip and said inside and outside stops having portions which overlap the side marginal edges of said strip to hold them in position.

12. A window comprising jambs, upper and lower sashes slidable between said jambs and provided with channels in their jamb opposing edges, sash cords or the like connected to said sashes for balancing the same, and metal weatherstrips secured to the sash opposing faces of said jambs and provided with outwardly opening grooves adapted to slidably receive the side flanges of the channels in the jamb opposing edges of the sashes, the portions of the weatherstrips located between the meeting rails of the sashes and the head of the window being provided with hollow ribs adapted to be straddled by the channels in the side edges of said sashes, said sash cords extending through the hollow ribs in said weatherstrips.

13. A window comprising jambs, upper and lower sashes slidable between said jambs and provided with channels in their jamb opposing edges, sash cords or the like connected to said sashes for balancing the same, metal weatherstrips secured to the sash opposing faces of said jambs and provided with outwardly opening grooves adapted to slidably receive the side flanges of the channels in the jamb opposing edges of the sashes, the por-

tions of the weatherstrips located between the meeting rails of the sashes and the head of the window being provided with hollow ribs adapted to be straddled by the channels in the side edges of said sashes, said sash cords extending through the hollow ribs in said weatherstrips, and means attached to the sash chains for the upper sash for closing the lower end of the hollow ribs which straddle said upper sash chains.

Signed at St. Louis, Missouri, this 22d day of November, 1928.

ALFRED M. LANE.

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