

March 4, 1930.

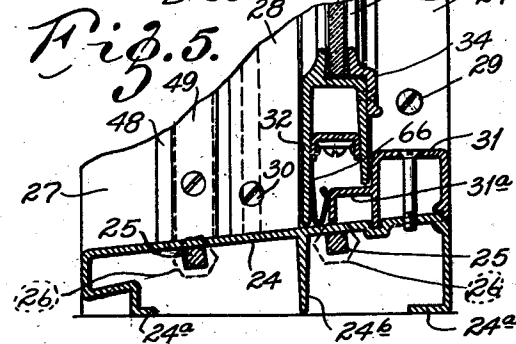
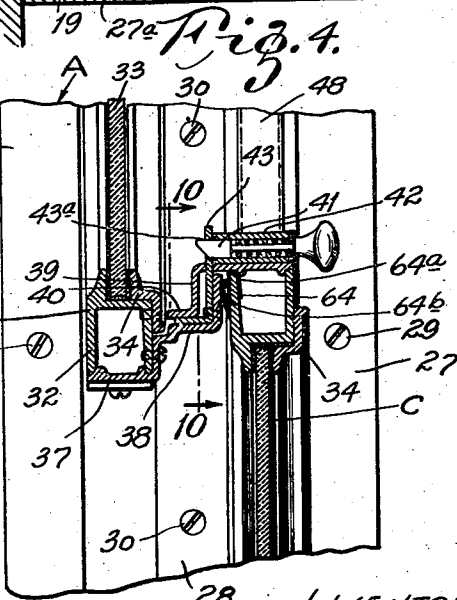
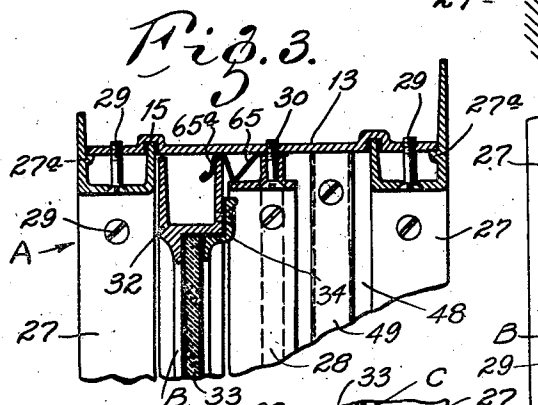
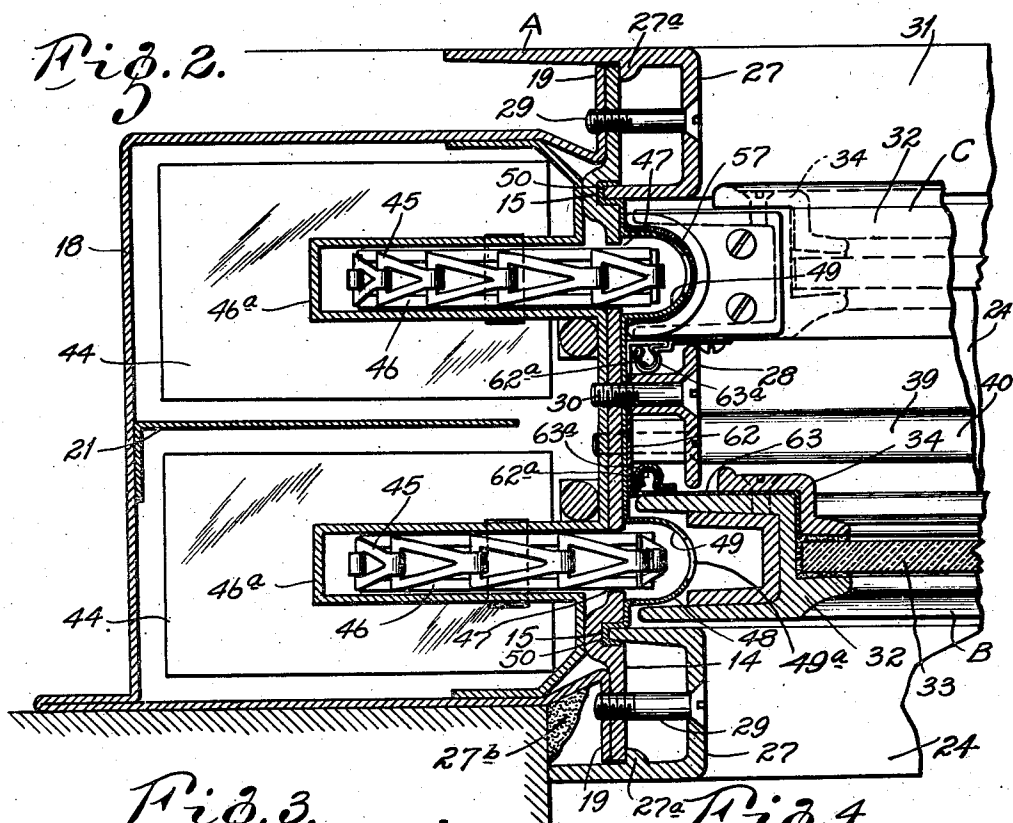
A. M. LANE

1,748,986

METAL WINDOW

Filed Dec. 17, 1927

3 Sheets-Sheet 2



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March 4, 1930.

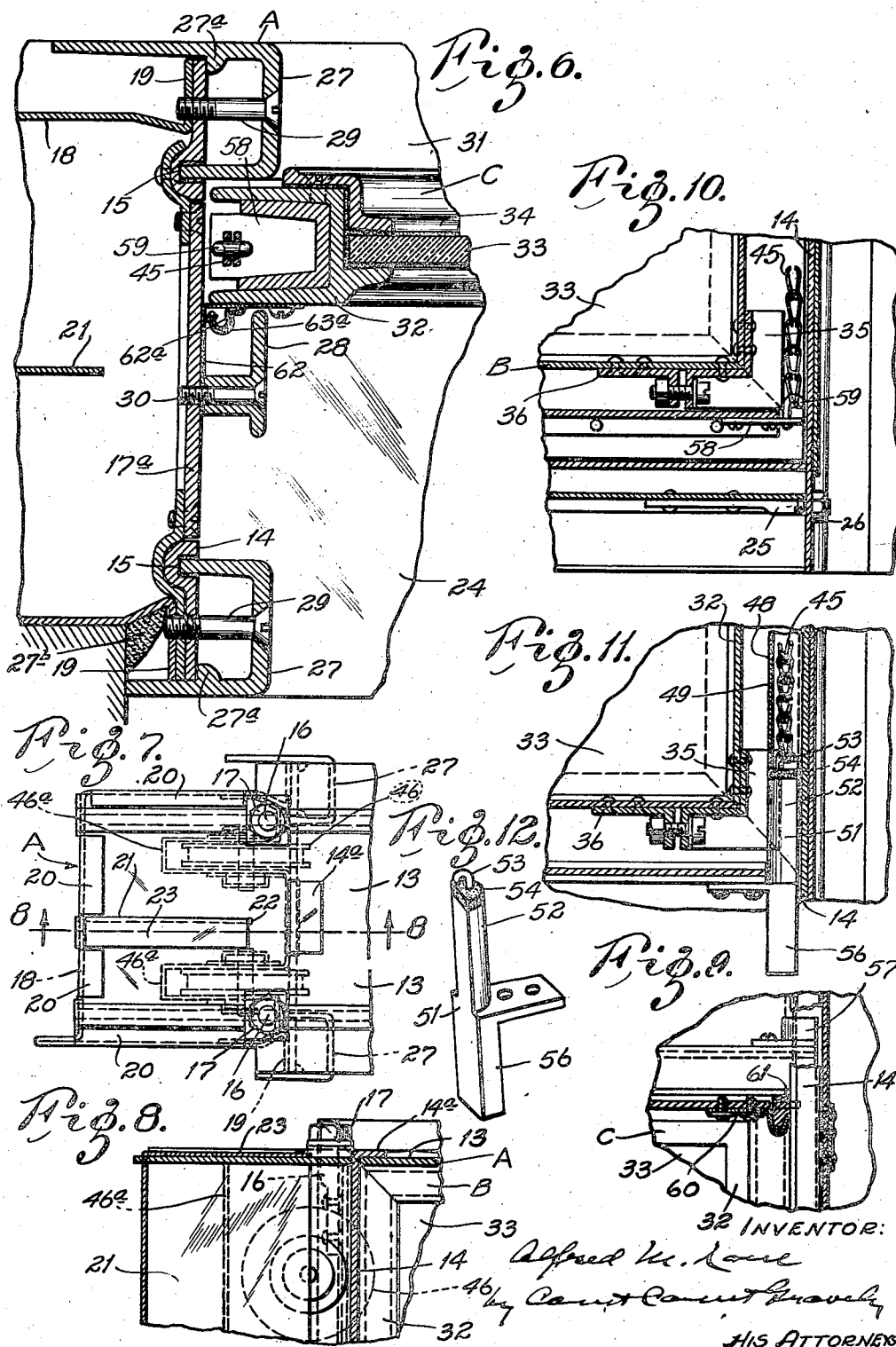
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UNITED STATES PATENT OFFICE

ALFRED M. LANE, OF ST. LOUIS, MISSOURI

METAL WINDOW

Application filed December 17, 1927. Serial No. 240,656.

This invention relates principally to metal windows equipped with sliding sashes and metal weatherstrips. It has for its principal objects to reduce to a minimum the amount of air and dust which may leak through the window, to conceal the weather-strips, sash chains and pulleys, to render easy the application of said strip to the window, to provide for the easy assemblage of the parts of the window, to permit the sash chains to be renewed without removing the sashes from the window frame, to reduce the weight of the window and the number of parts thereof, to simplify the construction thereof and to cheapen the cost of manufacture.

The invention consists in the metal window and 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 exterior side view of a weather-stripped metal window embodying my invention;

Fig. 2 is an enlarged horizontal cross-section through one side of the window, the section being taken above the meeting rails of the sashes and through pulley openings on the line 2—2 in Fig. 1;

Fig. 3 is a vertical cross-section through the head portion of the window on the line 3—3 in Fig. 1;

Fig. 4 is a vertical cross-section through the meeting rails of the sashes on the line 4—4 in Fig. 1;

Fig. 5 is a vertical cross-section through the sill portion of the window on the line 5—5 in Fig. 1;

Fig. 6 is a horizontal cross-section through one side of the window, the section being taken below the meeting rails of the sashes on the line 6—6 in Fig. 1;

Fig. 7 is a plan view of one of the upper corner portions of the window;

Fig. 8 is a vertical section on the line 8—8 in Fig. 7;

Fig. 9 is a fragmentary side view of the portion of the window adjacent to the ends of

the meeting rails of the sashes, showing the arrangement for closing the opening between the end of the meeting rail of the upper sash and the jamb of the window;

Fig. 10 is a fragmentary vertical section through the window adjacent to the ends of the meeting rails of the sashes on the line 10—10 in Fig. 4;

Fig. 11 is a fragmentary side view of the window in the region of the lower corner of the upper sash, the sash, jamb and chain guard being shown in vertical section and the removable chain anchor and chain guard closure being shown in elevation; and

Fig. 12 is a perspective view of one of the combined chain anchors and chain guard closures.

The present metal window 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 head and jamb members 13 and 14, respectively, of substantially the same cross-sectional shape; that is, the head member and each jamb member comprises metal members of substantially flat section having inwardly opening grooves or channels 15 extending longitudinally of said members adjacent to their inner and outer margins. The head member 13 extends across and beyond the upper ends of the jamb members 14; and the upper end of each jamb member is provided with a tab or extension 14^a, which extends through a slot provided therefor in the head member and is bent over on the upper side thereof. The head member and jamb member are further secured together by means of strap bolts 16 that are riveted or otherwise rigidly secured to the said jamb member. Said bolts extend upwardly through holes provided therefor in the head member and are provided at their upper ends with nuts 17 for drawing the end of the head member down on the upper end of the jamb member.

Secured to each of the jamb members 14 is a metal sash weight box 18 of substantially channel-shaped section with outstanding flanges 19 on its vertical side edges that are secured to the adjacent faces of said jamb.

The upper end of each sash weight box is closed by the overhanging end portion of the head member 13; and the upper end of said box is secured to said portion overhanging said head member by tabs 20, on the upper end of the pulley box that are bent over the sides and ends of the head member. Each sash weight box is divided into two compartments by means of a sheet metal pendulum 21, which is passed through an elongated slot 22 provided therefor in the extended portion of the head member and is suspended therefrom by a flanged portion 23 at the top of said strip which rests on the outer surface of the head.

The sill member 24 of the window frame A is disposed between the lower ends of the two jamb members 14 thereof and comprises a metal member of substantially channel-shaped section having inwardly projecting flanges 24^a at the lower edges of its side walls and a longitudinal strengthening web 24^b disposed midway therebetween. As shown in the drawing, the top or web portion of the inverted channel-shaped sill member slopes downwardly from the inner edge of the sill to the outer edge thereof to provide for drainage. Each end of the sill member 24 abuts against the jamb member 14 located adjacent thereto and is secured to said jamb member by means of horizontal strap bolts 25 that are secured to the underside of the web portion of the sill member, extend through openings provided therefore in said jamb member, and are provided at their outer ends with nuts 26.

Each of the jamb members of the window frame is provided with inside and outside stops 27 and a metal parting strip 28 which extend from head to sill of the window frame and form vertical slideways for the upper and lower sashes. As shown in the drawing, each of the metal window stops 27 comprises a channel-shaped member arranged with its inner flange within the longitudinal groove 15 near the adjacent edge of the jamb and with its outer flange overlapping said edge and provided with a shouldered portion 27^a which abuts against the corner of the jamb and constitutes a stop for maintaining a proper spacing between the web of the stop and the face of the jamb. The stops are secured to the jambs preferably by means of screws 29, and their outer flanges are preferably made somewhat longer than their inner flanges so as to conceal the edges of the jamb and the flanges of the sash weight boxes. The parting strip 28 comprises a metal member of substantially T-shaped section which is arranged with its web against the face of the jamb and with its side or head flanges spaced away from the jamb. The parting strip is secured to the jamb by means of screws 30 which pass through the web portion of said strip and are threaded into the jamb member. The parting strip and the stops for

the head member are the same as the parting beads and stops for the jamb members and are secured to the head member in the same manner in which the parting strip and stops are secured to the jamb members. The sill member 24 of the window frame is provided along its inner margin with an inverted channel-shaped member 31 which constitutes a stop for the lower rail of the lower sash. As shown in the drawing, the sill stop is secured in place by means of screws with the lower edges of its flanges seated in longitudinal grooves provided therefor in the top surface of the sill. The sill stop is also provided along its outer edge with downwardly offset portion 31^a which is located beneath the lower edge of the lower sash.

The metal frame members 32 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 outer corner with a flange or abutment which forms a seat for the window pane 33. The pane 33 is held in each sash by metal glazing strips 34 of angular section which fit the inner corners of the sash frame members 32 with one flange in abutting relation to the inner face of said pane. At the corners of the sashes the adjacent ends of the channel-shaped frame members 32 are beveled and are disposed with their mitered ends in abutting relation. The abutting ends of the frame members are secured together at each corner of each sash by means of an angle-shaped member 35 of channel-shaped section and an angle-shaped member 36 of flat section. The angles-shaped channel is located in the channels of adjacent frame member and fits the corner formed thereby and has one branch or leg riveted to one frame member. The other bracket seats within and is secured to the channel of the other frame member; and a screw passes through an opening in the adjacent closed end of the bracket 35 and is threaded into the adjacent end of the bracket 36, thereby permitting the adjacent ends of the frame members of each sash to be drawn together at each corner thereof.

The frame member which forms the lower rail of the upper sash, has its bottom closed by means of a plate 37 provided along its inner margin with inwardly and upwardly extending flange 38; and likewise, the top of the frame member, which forms the top rail of the lower sash, is closed by means of a cover plate 39 having an outwardly and downwardly extending Z-shaped flange 40 along its outer margin adapted to overlap the angular flange 38 on the cover plate 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 in their

closed position. Said lock comprises a spring-pressed bolt 41, which is mounted in a housing 42 secured to the cover plate for the top rail of the lower sash and is adapted in the closed position of the sashes, to enter a slot 43^a provided therefor in a plate 43 secured to the upstanding portion of the angular flange 38 at the inner edge of the closure plate for the bottom rail of the upper sash. As shown in the drawing, the inner end of the bolt 41 is beveled, whereby it is adapted to ride over the upper edge of the keeper plate 43 when the sashes are closed.

Located within the metal boxes 18 are sash weights 44 for counterbalancing the weight of the sliding sashes. The sash weights are suspended in the boxes 18 by sash chains, cords or ribbons 45 which pass over pulleys 46 journaled in brackets 46^a mounted in the upper ends of the pulley boxes through openings 47 provided therefor in the jamb members and thence downwardly in the channel of the side rails of the sash to the lower corner thereof. As shown in Fig. 6 of the drawing, the lower portion of each jamb member is provided with an opening whereby access may be had to the sash weights, and said opening is closed by a removable cover plate 17^a which is removably secured by screws to strips permanently secured to the edges of said opening. As shown in the drawing, the upper portions of the sash chains 45 are concealed by means of chain guards 48 comprising sheet metal cover plates whose upper ends abut against the head member of the window frame and whose lower ends terminate adjacent to the upper edge of the lower sash. Each of said chain guards has two hollow ribs pressed therein which extend longitudinally of the guard from end to end thereof and form channels 49 in one side thereof. Each of these chain guards is placed against the inner face of a jamb with its channels 49 astraddle the pulley chains; and said channels are, in turn, straddled by the channel-shaped side rails of the sashes and thus constitute guides therefor. The side margins of the chain guards are channeled, as at 50, to seat within the grooves 15 in the jamb member 14 and are clamped in said grooves by the inner flanges of the jamb stops 27. The middle portion of the chain guard is clamped to the jamb by means of the parting strip 28.

The sash weight chains for the upper sash B are secured to the lower corners thereof by means of an anchor block 51 removably secured to the lower corners of said sash. Each of these blocks comprises a plate portion, which is screwed or otherwise removably secured to the cover plate for the bottom rail of the upper sash, and an upstanding portion 52, which projects upwardly into the channel in the side rail of the sash and is provided at its upper end with a hook 53 adapted to receive

the adjacent end of the sash chain. Each chain anchor is also provided at its upper end with a pad 54 of felt or other suitable material adapted in the closed position of the upper sash to abut against the lower end of the outer channel of the chain guard to close the same, thereby preventing outside air from entering the room through the channels in the chain guard. Each chain anchor is also provided with a depending lug 56 adapted in the lowered position of the upper sash, to abut against the sill member of the window and thus prevent the upper end of the sash from sliding off the lower end of the chain guards. The chain guards terminate short of the top rail of the lower sash A and the joints between the lower ends of the inner channels of the chain guards and the top of said sash are closed by means of sealing brackets 57 comprising base flanges secured to the top of the sash and vertically grooved upstanding portions which are lined with felt or other suitable material, and snugly embraces the lower end of the inner channels of the chain guard. The chain for the lower sash is secured to the lower corners thereof by means of anchor plates 58 that are removably secured to the bottom rail of the lower sash and are provided with upstanding hooks 59 positioned within the channels in the side rail of said sash in position to receive the chains. The space between each end of the angular meeting rail flange 38 of the upper sash and the adjacent jamb member is closed by means of a plate 60 which is secured to the under side of said flange and is provided with an upwardly opening V-shaped groove adapted, in the closed position of the upper sash, to embrace or straddle the V-shaped lower end portion of a block 61 secured to the jamb opposite the end of said meeting rail.

In order to prevent the leakage of air and dust through the joints between the jambs and side rails of the sashes, the jambs and side rails are provided with weather-strips. The weather-strips for the side rail of each sash and the adjacent jamb member preferably comprises two metal strips 62 and 63, respectively. The jamb strip 62 is preferably resilient and is secured along one margin of the jamb, preferably under the parting strip. The resilient jamb strip is bent substantially at right angles adjacent to its opposite margin and is thence rebent or looped to provide a substantially undercut rib 62^a adapted to slide in an undercut groove 63^a provided therefor along one margin of the cooperating sash strip 63, whose other margin is secured to the side rail of the sash. With this arrangement of side weather-stripping, dust and air are prevented from passing through the window between the jambs and the side rails of the sashes while the sashes may be mounted in the slideways with considerable looseness due to the flexibility of the ribbed jamb strip. As

shown in the drawing, the sash strip is secured to the inner face of the upper sash and to the outer face of the lower sash; and the cooperating tongue and groove portions of the sash and jamb strips are disposed in the space between the jamb and the wide flange of the T-shaped parting strip which serves to conceal the cooperating tongue and groove portions of said strips. It is noted that parting strip on each side of the window is divided near the top rail of the lower sash and that the positions of the two sections are reversed so that the web of each section of the parting strip is located at a maximum distance from the floating joint between the sash and jamb strips covered by said section, thereby affording greater resiliency to the jamb strip.

The joint between the meeting rails of the upper and lower sashes is made air and dust-proof by means of a metal weather-strip 64 having a channeled portion 64^a which straddles the upstanding outer flange of the top rail of the lower sash and is clamped thereto by means of the cover plate which closes the channel in said top rail. The meeting rail strip 64 is rebent along its free outer margin to form a resilient sealing flange 64^b adapted, in the closed position of the two sashes, to bear against the upstanding flange of the meeting rail of the lower sash and thus prevent the passage of air and dust between the meeting rails of the sashes.

The joint between the top rail of the upper sash and the head member of the window frame is sealed by means of a metal weather-strip 65, which is clamped along one margin to the head member by the web of the parting strip of the head member and is provided along its free opposite margin with a downwardly opening groove 65^a adapted to cooperate with the inwardly upstanding flange of the top rail of the upper sash in the closed position of said sash.

The joint between the bottom rail of the lower sash and the sill is sealed by means of a metal weather-strip 66 having one margin secured to the depending outer flange of the bottom rail of the lower sash and the other free margin rebent to form a resilient sealing flange adapted to bear against the outer edge of the sill stop in the closed position of the lower sash.

In order to prevent leakage of air and dust through the joint between the brick work and the outer face of the sash weight box 18, said joint is sealed at the angle formed by the adjacent edges of said brick work and said sash pulley box by means of suitable caulking material 27B. The outside stop is secured to the jamb after the caulking has been applied and thus serves to conceal said caulking and protect it from the heat of the sun, which tends to cause it to run and then dry

out and pull away from the surfaces to which it is applied.

The hereinbefore described arrangement reduces to a minimum the infiltration of air through the window; it also serves to conceal the sash pulleys and chains. It is noted as an important advantage of my invention that it permits the sash chains to be removed without removing either of the sashes from the frame. For instance, when it is desired to renew one of the sash chains for the upper sash, the lower section of the parting strip and the cover plate 17^a are removed from the jamb, whereby access may be had to the sash weight through said opening. The anchor block 51, whose hook 53 serves to anchor the chain that is to be renewed, is then removed from the lower corner of the sash and the chain detached from the anchor block and the said weight. One end of the new chain is then attached to a wire which is passed through an opening 49^a provided therefor in the channel 49 of the chain guard 48 opposite the sash pulley, and said end of said chain is then drawn over said pulley down into the sash weight box and the weight attached to the chain. The other end of the chain is then pushed through the opening 49^a and permitted to drop down into the channel 49 in the chain guard, after which the end of the chain is then attached to the hook 53 of the chain anchor 51 which is then again attached to the corner of the sash. The chains for the lower sash may also be renewed without removing said sash in the manner just described by removing the sash anchor plates 58 at the lower corners thereof.

It is also noted that the herein described metal window construction 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 framing members required for the window.

Obviously numerous changes may be made without departing from the invention, and I do not wish to be limited to the precise arrangement shown and described.

What I claim is:

1. A window comprising jambs, a lower sash slidable between said jambs, sash cords or the like connected to said sash for balancing the same, guard members mounted on the sash opposing faces of said jambs and extending from the top of said sash in the lowered position thereof to the upper portions of said jambs, said sash cords extending between said jambs and said guard members, and a bracket removably secured to the top of said sash at each end thereof and slidably engaging the portions of the guard members which cover said sash cords.

2. A window comprising jambs, upper and lower sashes slidable between said jambs, sash cords or the like connected to said sashes

for balancing the same, guard members secured to the sash opposing faces of said jambs and provided with channels which extend from the top of the lower sash in the closed position thereof to the upper portion of said jambs, said sash cords extending through said channels, and means carried by the upper sash for closing lower ends of the channels for the sash cords of the upper sash in the closed position thereof.

3. 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 guard plates secured to the sash opposing faces of said jambs and extending from the upper portion of the lower sash in the closed position thereof to the upper portions of said jambs, each of said plates having hollow ribs pressed thereon adapted to be straddled by the channels in the side edges of said sashes, said sash cords extending through said hollow ribs, and means mounted on the upper sash and operating in the closed position thereof to close the lower ends of the ribs for the cords for the upper sash, said means closing the lower ends of the channels in the side edges of said upper sash and constituting means for anchoring the sash cords thereto.

4. A window comprising jambs provided with vertical grooves in their sash opposing faces, upper and lower sashes slidable therebetween, sash cords or the like for balancing said sashes, and guard members mounted on the sash opposing faces of said jambs and extending from the top of the lower sash in the closed position thereof to the upper portions of said jambs, said sash cords extending between said guard members and said jambs, said guard members having channels in their side marginal edges adapted to seat in vertical grooves in said jambs, and inside and said outside stops secured to said jambs and having flanges seated in the channels in the side marginal edges of said guard members for clamping them to the jambs.

5. 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 guard plates secured to the sash opposing faces of said jambs and extending from the upper portion of the lower sash in the closed position thereof to the upper portions of said jambs, each of said plates having hollow ribs pressed thereon adapted to be straddled by the channels in the side edges of said sashes, said sash cords extending through said hollow ribs, and members removably secured to the lower corners of the upper sash for anchoring the sash cords thereto and for closing the lower ends of the hollow ribs for the

cords for said sash and the lower ends of the channels in the side edges thereof, said members being provided with depending portions adapted in the lowered position of the upper sash to abut against the sill of the window and thereby prevent the upper ends of the channels in the lower sash from becoming disengaged from the lower ends of the hollow ribs cooperating therewith.

6. A window frame comprising a head, jambs provided with sash pulley openings, sash weight boxes secured thereto, upper and lower sashes slidable between said jambs, sash pulleys mounted in said boxes opposite the sash pulley openings in said jamb, sash cords or the like supported on said sash pulleys and extending through said sash pulley openings and connected with said sashes for balancing the same, and guard plates secured to the sash opposing faces of said jambs and extending from the top of said lower sash in the closed position thereof to the underside of the head, said sash cords extending between said jambs and said guard plates, said guard plates having sash cord receiving openings extending therethrough opposite said sash pulleys.

7. A window frame comprising head, sill and jamb members, the end portions of the head member extending beyond the jamb members, sash weight boxes secured to the jamb members beneath the extended end portion of the head member, the upper ends of the sash weight boxes being provided with extensions that are bent over the upper side of the extended end portions of said head member, the extended end portions of said head member being each provided with an opening communicating with the sash weight box cooperating therewith, and a partition plate inserted in said box through the opening in the extended end portion of said head member and provided at its upper end with a flange adapted to rest on the top surface of said head member.

8. A window frame comprising head, sill and jamb members, bolts secured to one of said members at each corner of said frame and extending through holes provided therefor in the other member, and nuts on the projecting ends of said bolts in position to bear against said last mentioned member.

9. A window frame comprising head, sill and jamb members, bolts secured to one of said members at each corner of said frame and extending through holes provided therefor in the other member, and nuts on the projecting ends of said bolts in position to bear against said last mentioned member, one of the frame members being provided adjacent to one corner of the frame with an opening and the other of said framing members at said corner being provided with a tab which projects through said opening in said frame

member and is bent over on the inner face thereof.

10. A window comprising jamb members, sash weight boxes secured to said jamb members, brick work covering said boxes and terminating adjacent to the outer edges of said jambs, means for closing the joints between said boxes and said brick work, and means removably secured to said jamb members and covering said joint closing means.

11. A window comprising jamb members, sash weight boxes secured to said jamb members, brick work covering said boxes and terminating adjacent to the outer edges of said jambs, caulking for closing the joints between the said boxes and said brick work, and stops secured to said jambs and having flanges covering the meeting edges of said jamb members and said boxes and said caulking, and abutting against the adjacent edges of said brick work.

Signed at St. Louis, Missouri, this 15 day of December, 1927.

ALFRED M. LANE.

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