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WINDOW

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Fig. 1.

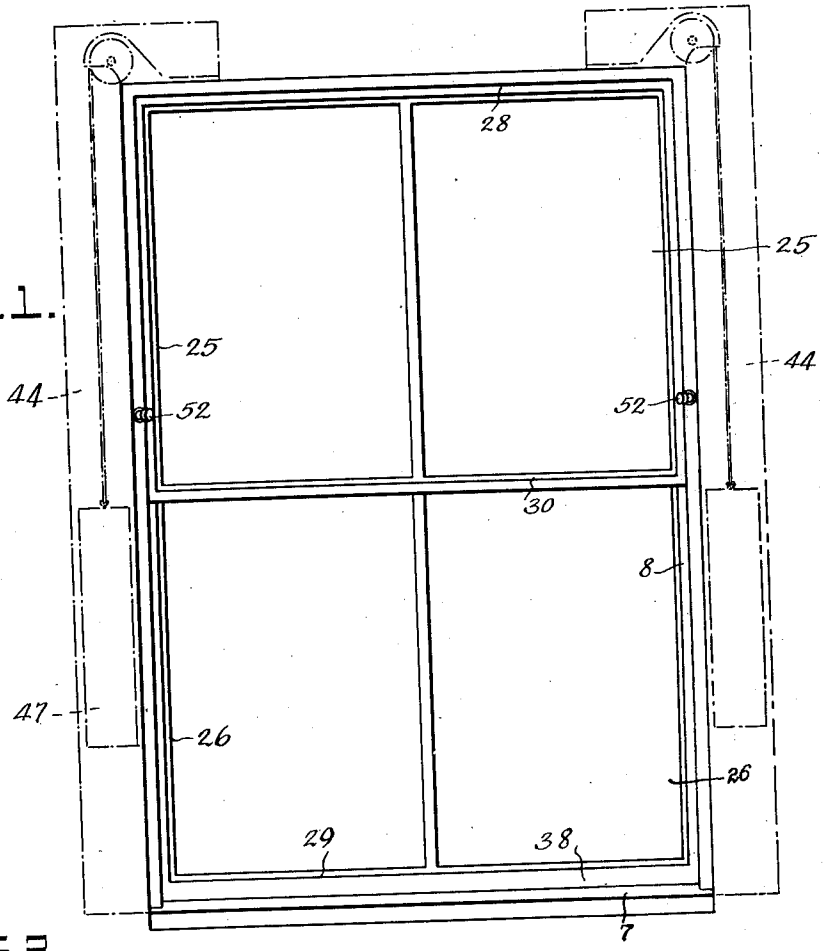
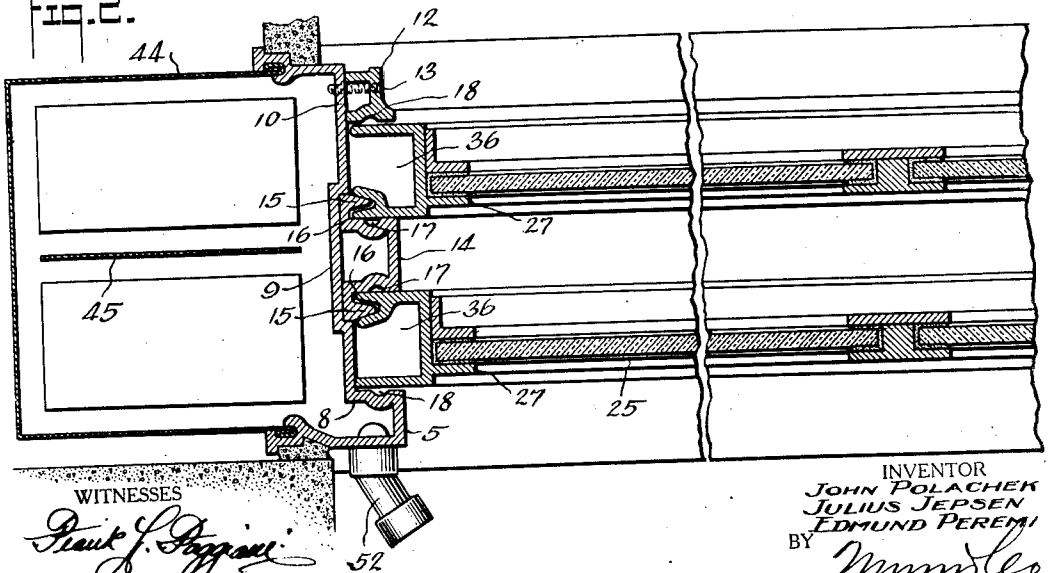



Fig. 2.




WITNESSES

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FIG. 3.

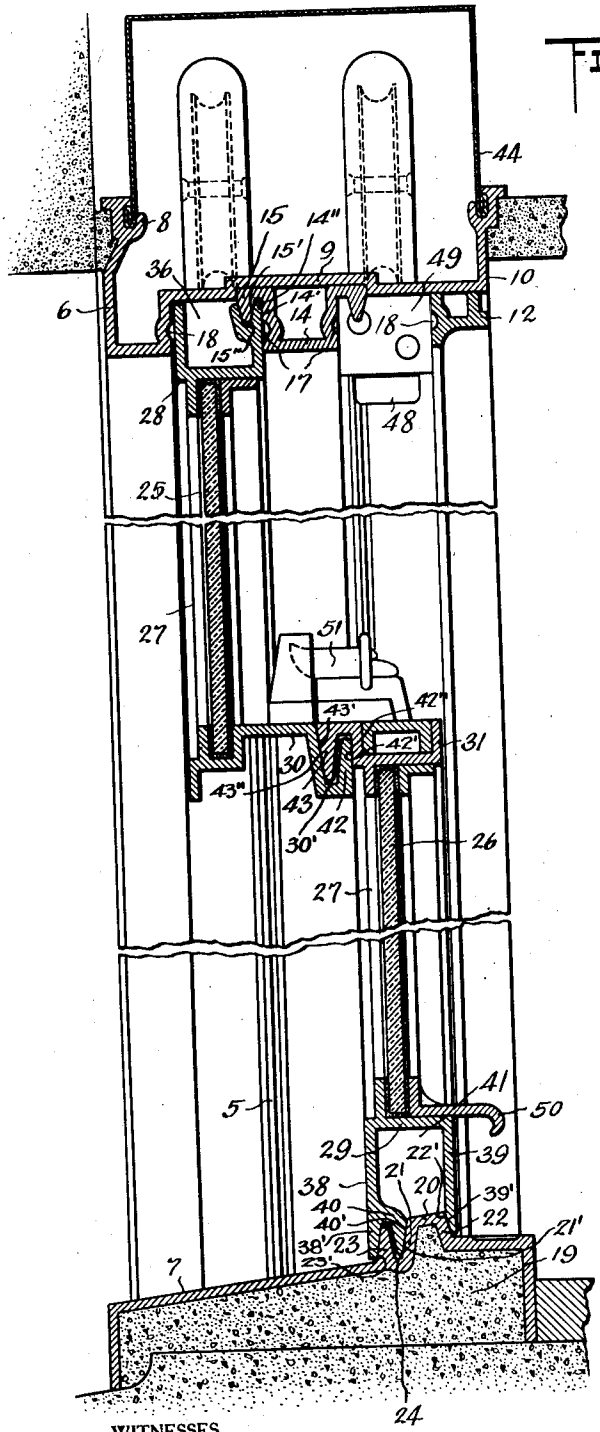



FIG. 4.

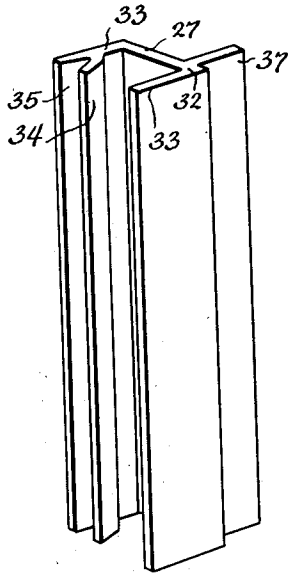
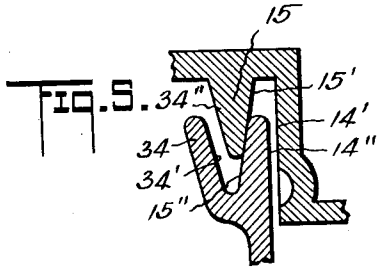



FIG. 5.




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# UNITED STATES PATENT OFFICE.

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## WINDOW.

Application filed June 22, 1925. Serial No. 38,905.

This invention relates to improvements in windows and has particular reference to a metallic window construction.

The object of the invention is to provide an improved metallic window with sliding sashes wherein the window frame and sashes are so constructed and interengaged that when the window is in closed position, there will be insured two or more points of contact, metal to metal, all around each sash, that is, at the head, the sill and the two sides of the frame and at the meeting rail or rails of the sashes.

Another object of the invention is to provide an improved window wherein the window frame and sashes are so constructed and interengaged that the same will effectively prevent the ingress of air and dust into a room when the sashes are in closing position.

A further object is the provision of an improved window in which the frame and sashes are so constructed and interengaged that any rattling of the sashes, when closed, due to lateral movement thereof with respect to the frame, will be prevented.

A still further object is to so construct the frames and sashes that the window may be readily and quickly assembled in operative position.

The above and other objects will appear more clearly from the following detail description, when taken in connection with the accompanying drawings, which illustrate one embodiment of the inventive idea.

In the drawings—

Figure 1 is a front elevation of a window constructed in accordance with the invention;

Figure 2 is a fragmentary transverse section of the window showing both sashes in cross section;

Figure 3 is a vertical sectional view of the window with both sashes in closing position;

Figure 4 is a perspective view of one of the stiles of the sashes;

Figure 5 is an enlarged fragmentary sectional view showing part of the head of the window illustrated in Figure 3 while the same is partially open.

The window is made of any desired material, such as steel or bronze, which is rolled or extruded to form the various parts of the window. The frame of the window comprises the side, top and sill sections 5, 6, and 7 respectively. The side sections, only one of which is illustrated in Figure 2, each comprises the outer, intermediate and inner portions 8, 9 and 10 respectively, the intermediate portion being preferably integral with the adjacent outer and inner sections. Forming a part of the inner portions 10 is a stop or guide 12 secured to said portion by means of fasteners 13. Medially of its longitudinal edges, the intermediate portion 9 is provided with a parting strip 14 held in place by screws or other suitable means. On opposite sides of the parting strip 14 there are provided wedge-shaped flanges 15 which combine with the sides of the parting strip to form grooves 16 for the purpose which will hereinafter appear. The sides of the parting strip 14 are also formed with vertically disposed grooves 17 similar to grooves 18 formed in opposed surfaces of the portion 8 and the guide 12.

The sill section 7 is of channeled formation so as to receive a suitable material 19 utilized to securely anchor said section in proper position with respect to the sill of the window opening. Intermediate the edges of the section 7 the same is provided with an upwardly projecting portion 20 having sides 21 and 22, the former of which cooperates with a wedge-shaped flange 23 to form a groove 24 for a purpose which will appear in the course of the description.

The window further comprises the upper and lower sashes 25 and 26 which are practically identical in construction. The sashes 25 and 26 include stiles, generally indicated by the numeral 27, the upper and lower rails 28 and 29 and the meeting rails 30 and 31. The stiles 27 and the upper and lower rails 28 and 29 are substantially alike in construction and each includes a web portion 32 (see Figure 4) having the flanges 33 extending from the longitudinal edges thereof in the same direction and in parallel relation. Formed integrally with one of the flanges 33 and extending from the inner face thereof and intermediate its longitudinal edges is a diagonally disposed flange 34 which combines with the outer portion of said flange 33 to form a substantially V-shaped groove 35. The groove 35 of the upper rail 28 is designed to receive one of the flanges 15 of

the intermediate portion 9 of the frame. The inner portions of the flanges 33 upon which the flanges 34 are formed engage in the groove 16, thus forming a connection between the sashes and frame. Furthermore, as the upper sash is raised to a completely closed position as illustrated in Figure 3, the surface 15′ of the wedge-shaped flange 15 will crowd the head of the sash in a direction at right angles to the plane of the window so that the parts will assume the position shown in Figure 3 when the window is completely closed. By the time that the surfaces 15′ and 15″ have crowded the head of the sash over until the surface 14″ engages the surface 14′, the surface 34′ of the flange 34 will be engaging the surface 34″ of the wedge 15. In this manner, a three point contact is provided. This contact is continuous for the full length of the flange 15. It will, therefore, be noted that a plurality of surface contacts are provided which will be in engagement for their full surface when the window is completely closed as shown in Figure 3. It will be noted that the V-shaped groove 35 and flange 15 are accurately matched to fit each other and the parts are so positioned that ordinarily the sash may be moved up and down freely but when the parts are in their completely or exactly closed position, there will be a good contact between the various parts.

The flanges 38 and 39 of the lower rail 29 of the lower sash are of different widths and the flange 38 is provided with a flange 40 similar to the flanges 34 to form a groove for receiving the flange 23 when the lower sash is in closed position. The flange 40 then also engages in the groove 24 to form a contact between the lower rail and sill. The wedge-shaped flanges 23 and the V-shaped groove formed by flanges 38 and 40 are accurately matched so that when the lower sash is completely closed, the, parts will assume the position shown in Figure 3 and thereby produce a three point contact or three surfaces of contact for the full length of the sill. As the lower sash is moved to its fully closed position illustrated in Figure 3, the flange 40 will engage the side 21 and, consequently, crowd or shift the lower part of the sash toward the left as shown in Figure 3 and thereby cause the flange 39 to press firmly against the side 22. The shape and relative position of the flange 38 and flange 23 will cause these two members to tightly engage at the same time as the above action takes place.

From Figure 3 it will be noted that when the lower sash is completely closed, the surface 40′ will be engaged by the surface 21′ of side 21 and that there will be a wedging action which will cause the contact surface 39′ of flange 39 to press tightly against the contact surface 22′. The action of the surfaces 21′ and 40′ in effect pulls the surfaces 39′ against the surface 22′ while the surfaces 38′ and 23′ move into engagement as the sash is lowered to its fully closed position. In view of this action and also the action at the top of the window as illustrated particularly in Figures 3 and 5, a plurality of contact surfaces are provided and when the meeting rails are pulled together, the same effect will be produced between the sashes and the vertical flanges 15 whereby there will be a plurality of contact surfaces around the entire perimeter of each of the sashes, particularly as there are two contact surfaces at the meeting rails illustrated in Figure 3. The meeting rails 30 and 31 are provided with a well known locking device 51 of a type which when thrown to locking position, simultaneously forces the upper sash upwardly a short distance while it draws the meeting rails 30 and 31 together to effect continuous contact of certain contact surfaces as illustrated in Figure 3. It will be noted that the adjacent edges of the meeting rails are provided with flanges 42 and 43 which overlap and interengage as illustrated in Figure 3. The window is illustrated in the position when the lock 51 has been operated and the window completely or tightly closed. When this takes place, the two meeting rails are pulled toward each other to produce a good contact over a plurality of surfaces not only with the flanges 15 but also with the parts of the meeting rails.

From Figure 3 it will be noted that the surface 43′ is tightly pressing against the surface 43″ while the surface 42″ is pressing tightly against the surface 42″ and there is a small space 30′ between the flanges 42 and 43. Thus with the upper rail 28 and the rail 30 of the upper sash 25 simultaneously forced inward in a lateral direction with respect to the frame, and at the same time the meeting rail 31 and the lower rail 29 of the lower sash forced outward in a lateral direction with respect to the frame, all as hereinbefore explained, the inner flanges 33 of the stiles 27 of the upper sash 25 are also simultaneously forced into face contact with the outer side of the parting strips 14, also effecting other contacts between the flanges 15 of the side jambs of the frame and the flanges 34 of the sash stile. The outer flange 33 of the two stiles 27 of the lower sash are also forced into face contact with the inner side of the parting strip 14 by reason of the crowding over of the bottom rail 29 as it engages the sill and also by reason of the action of the lock 51 pulling the meeting rails together. It, therefore, is evident that the complete closing and locking of the sashes effects two or more continuous contacts, metal to metal, between the two sashes

and the frame at the head, the two sides and the sill as well as the meeting rails of the two sashes.

The outer surfaces of the flanges 33 of the stiles 27 and upper rail 28 engage the sides of the parting strip 14 and combine with the grooves 17 therein to form small air chambers which aid in preventing air passing around the sashes into the interior of a room. In addition to the air chambers formed by the grooves 17 the outer flanges 33 of the stiles 27 and upper rail 28 combine with the grooves 18 in the members 8 and 12 to form other air chambers. Also the stiles 27 and upper rail 28 combine with the sections 5 and 6 of the frame to form the large air chambers 36. Adjacent to one of the longitudinal edges of the web portion 32 of each stile and upper rail another flange 37 extends in the opposite direction from the flanges 33 but in parallel relation thereto and this flange 37 is utilized in securing the pane of glass in the window sash, as clearly illustrated in Figures 2 and 3. The inner flange 39 of the lower rail overlaps the side 22 of the raised portion 20 and said lower rail combines with the sill section to form the air chamber 41 similar to the chambers 36. Disposed on each side of the window and extending partially over the top thereof, are the casings 44, in which the parting strips 45 are disposed for dividing the casing into compartments for receiving the usual counterweights 47 for the sashes. The intermediate portions 9 of the side sections of the frame may be provided, if desired, with rubber bumpers 48 supported by means of plates 49 and against which the lower sash may engage to prevent noise when opening the window. The lower sash 26 is provided with an operating handle 50 to facilitate the raising and lowering of the sash. The outer portions 8 of the side sections may have anchored therein the rings 52 utilized for the purpose of attaching a safety belt thereto when washing the window.

What is claimed is:

1. In a window construction, a window frame having side and top sections each including outer, intermediate and inner members, said intermediate members being formed with a parting strip and a flange arranged along each side of said parting strip, and window sashes each having flanges combining to form a groove for receiving one of the first named flanges, one of the flanges of each sash contacting a side of said parting strip.

2. In a window construction, a window frame having side and top sections each including outer, intermediate and inner members, said intermediate members being formed with a parting strip, the sides of which are provided with grooves, and opposed faces of said outer and inner members being also provided with grooves, and window sashes including flanges engageable with the sides of said parting strip and said opposed faces and cooperating with said grooves to form air chambers.

3. In a window construction, a window frame having side and top sections each including outer, intermediate and inner members, said intermediate members being formed with a parting strip, the sides of which are provided with grooves, and opposed faces of said outer and inner members being also provided with grooves, and window sashes including flanges engageable with the sides of said parting strip and said opposed faces and cooperating with said grooves to form air chambers, said flanges also cooperating with said sections to form other air chambers.

4. In a window construction, a window frame including a sill section having an upwardly projecting portion and a flange adjacent one side of said portion to form a groove, and a sash mounted in said frame and having a rail including a flange disposed on each side of said upwardly projecting portion, one of said flanges being engageable with the adjacent side of said portion when the sash is in closing position, and the other flange being provided with a third flange which forms with said flange a groove for receiving the flange on said sill section and which engages in the groove formed in said sill section.

5. In a window construction, a window frame including a sill section having an upwardly projecting portion and a flange adjacent one side of said portion to form a groove, and a sash mounted in said frame and having a rail including a flange disposed on each side of said upwardly projecting portion, one of said flanges being engageable with the adjacent side of said portion when the sash is in closing position, and the other flange being provided with a third flange which forms with said flange a groove for receiving the flange on said sill section and which engages in the groove formed in said sill section, the first two named flanges of said rail combining with said sill section to form an air chamber.

6. A window comprising a frame, sliding sashes carried by said frame, said frame and sashes being formed with interengaging means between the sashes and frame presenting a multi-surface metallic contact when the sashes are in their closed position, said means acting to shift the sashes at right angles to the plane of the frame for causing a multiple contact at the top and bottom of the window, and manually actuated means for forcing the sashes in a direction at a right angle to their planes and the meeting rails of the sashes into intimate closed relation whereby the sashes when

closed maintain throughout their perimeters not less than a two surface metallic contact with the frame and the meeting rails with each other.

7. A window comprising a metallic frame, a pair of metallic sashes slidingly mounted in said frame, said sashes having meeting rails with a plurality of contact surfaces, and a lock for drawing said meeting rails together and at the same time pushing upwardly on the upper sash and downwardly on the lower sash, said sashes and said frame being formed with co-acting means whereby when said lock is moving to a locked position the sashes will be moving in a direction substantially at right angles to their planes and caused to engage the frame throughout the perimeters and the sashes at a plurality of surfaces of contact and the meeting rails will be caused to contact at not less than two contact surfaces for their entire length.

8. A window, comprising a metallic frame, a plurality of sliding sashes carried by said frame, co-acting means carried by the frame and sashes presenting a multi-surface contact adjacent the perimeter of the sashes for each sash including the meeting rails thereof, and means for moving the sashes into snug contact with the frame automatically effective simultaneously with the closing of the window.

9. A window, comprising a metallic frame, a plurality of metallic sliding sashes carried by said frame, co-acting means extending from the frame and sashes presenting not less than two contact surfaces substantially coextensive with the perimeter of each sash and co-acting with contact surfaces on the frame and not less than two contact surfaces for the respective meeting rails of the sashes extending the full length thereof, means at the upper and lower rails automatically effective for moving the same into snug contact with the frame when the window is closed, and means at the meeting rails for moving the same closely together whereby the window can be rendered wholly air-tight when closed.

10. A window, comprising a metallic frame, a plurality of metallic sliding sashes carried by said frame, co-acting means extending from the frame and sashes presenting a contact surface substantially co-extensive with the perimeter of each sash and co-acting with contact surfaces on the frame and not less than two contact surfaces for the respective meeting rails of the sashes extending the full length thereof, the co-acting means including a parting strip on the frame, and means adjacent to said parting strip to move the sashes laterally toward each other when the window is closed.

11. In a window construction, a frame and a sash slidable therein, coacting means being provided between the sash and the frame including fixed wedge means effective for moving the sash into snug contact with the frame when the window is closed.

12. A window, comprising a frame, a plurality of sliding sashes carried by said frame, coacting means including a parting strip, between the frame and the upper and lower rails to move said rails laterally toward each other into contact with said parting strip automatically with the closing of the window, and means at the meeting rails to draw the same snugly together when the window is closed whereby the window is rendered wholly air tight.

13. In window construction, a frame having a parting strip, the sides of which are provided with grooves, and sashes slidable in said frame in contact with said parting strip and cooperating with said grooves to form air chambers.

14. In window construction, a window frame, a sash slidable therein and cooperating therewith to form an air chamber extending along the edge of said sash, and means effective when the window is closed to draw the sash into snug contact with the frame to render the air chamber tight.

15. In window construction, a window frame and a sash slidable therein, cooperating means being provided between the sash and the frame to increase the air tightness of the window including a wedge-shaped flange on one of the parts and a groove to receive the same on the other part.

16. In window construction, a window frame, a sash slidable therein, and means cooperating between the sash and the frame at the upper rail of the sash including a wedge-shaped flange extending substantially horizontally on one of said parts and a groove on the other part to receive the flange whereby a multiple surface contact is provided, the flange and groove being so arranged as to move the sash laterally into snug contact with the frame when the flange is received in said groove upon the closing of the window.

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