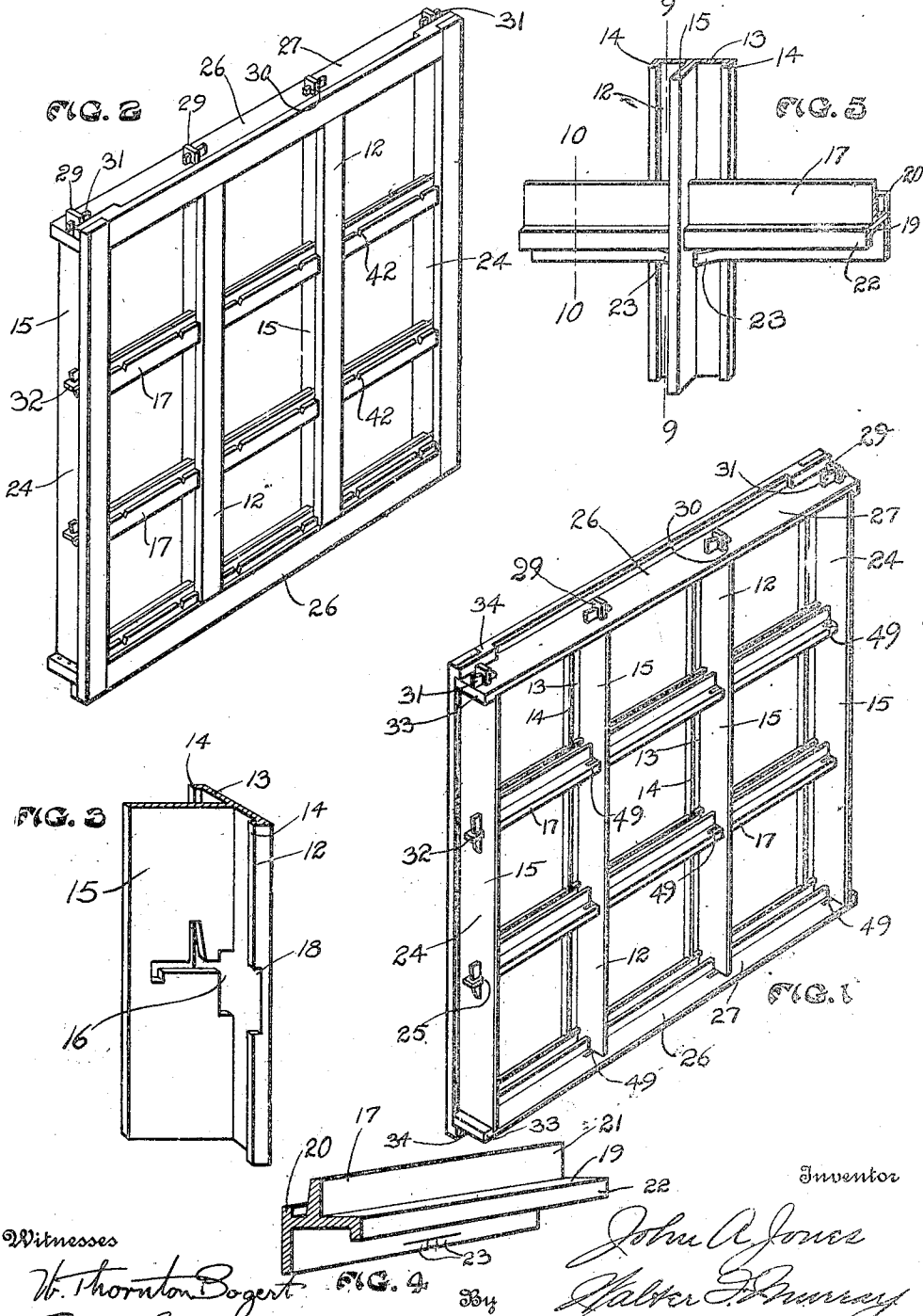


J. A. JONES.
METAL WINDOW SASH,
APPLICATION FILED JAN. 23, 1911.

1,101,745.

Patented June 30, 1914.

3 SHEETS—SHEET 1.



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FIG. 4

34

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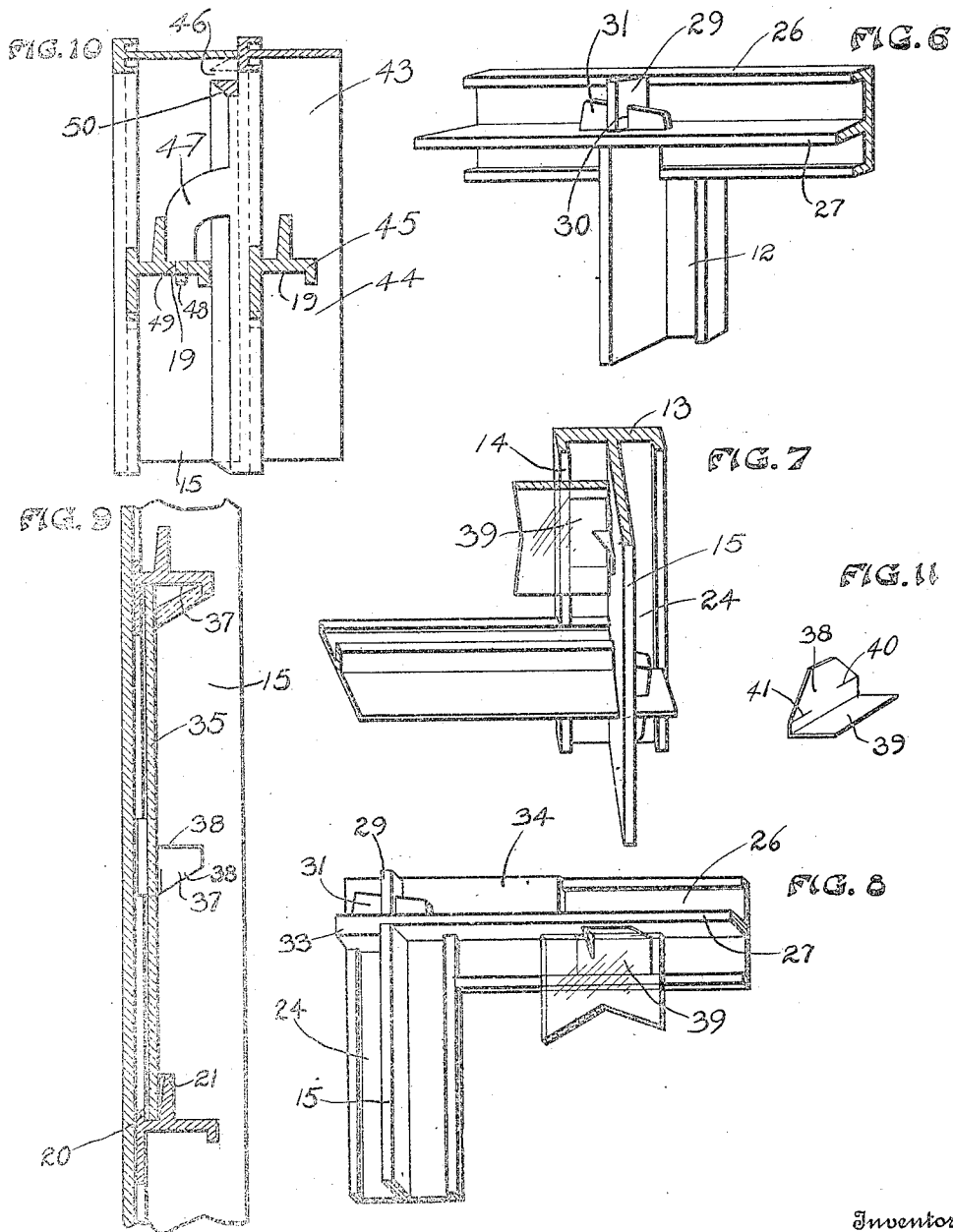
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3 SHEETS-SHEET 2.

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3 SHEETS—SHEET 3.

FIG. 12

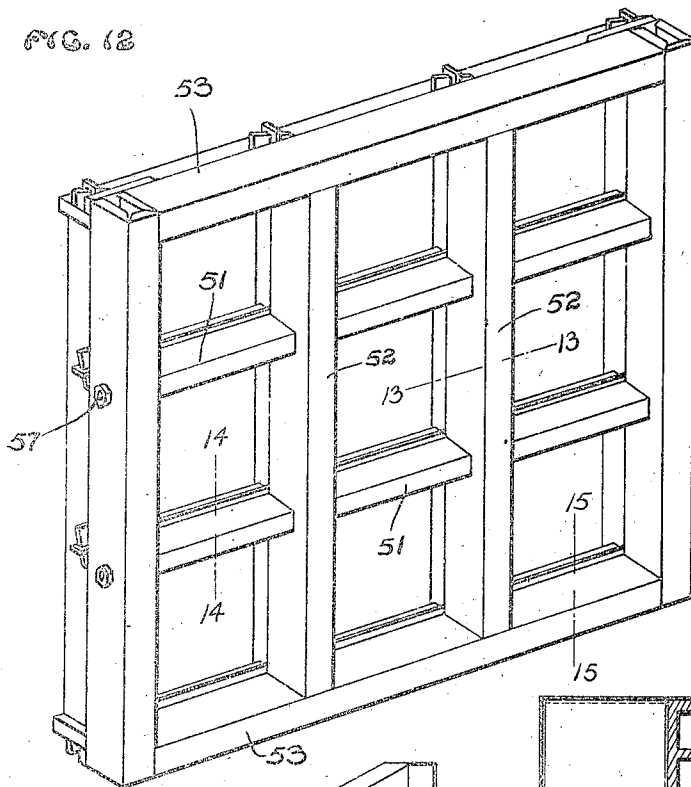


FIG. 13

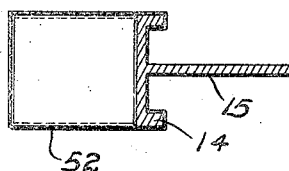


FIG. 16

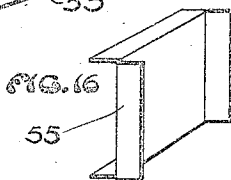


FIG. 14

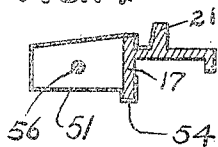
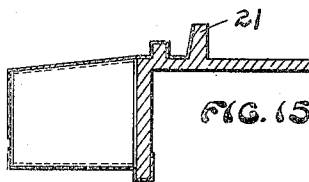


FIG. 15



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UNITED STATES PATENT OFFICE.

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METAL WINDOW-SASH.

1,101,745.

Specification of Letters Patent. Patented June 30, 1914.

Application filed January 23, 1911. Serial No. 604,057.

To all whom it may concern:

Be it known that I, JOHN A. JONES, a citizen of the United States of America, and resident of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Metal Window-Sash, of which the following is a specification.

This invention relates to window sash and has for an object to produce an improved metal window sash.

A further object is to produce a metal window sash provided with improved means for securing the panes of glass in place in the sash.

A further object is to produce a double sash for windows, in which one sash is easily removable from the other, for the purpose of obtaining access to the glass in each sash.

A further object is to produce a metal sash for windows, in which the separate parts forming the sash are separately formed and are capable of being easily assembled.

A further object of my invention is to provide means for protecting the metal members of the sash from extreme heat, which may be occasioned by fire, and to consequently prevent the window sash from warping and breaking out the fireproof glass, with which it may be provided.

These and other objects I attain by means of apparatus embodying the features herein described, and illustrated in the drawings accompanying this application and forming a part thereof.

In the drawings: Figure 1 is a perspective view of a sash embodying my invention, the interior face of the sash being shown. Fig. 2 is a perspective view of the sash shown in Fig. 1, and shows the exterior face of the sash. Fig. 3 is a perspective view of a portion of an upright member which forms a detail of my invention, and illustrates the arrangement of an aperture provided in the member for the reception of a transverse member. Fig. 4 is a perspective view of a transverse or horizontal member, which forms a part of my invention. Fig. 5 is a perspective view of a portion of a vertical and a horizontal member, and illustrates the means employed for securing the members together. Fig. 6 is a perspective view of a portion of an intermediate vertical member and the top horizontal member, and illustrates the means employed for connecting

them together. Fig. 7 is a perspective view of a portion of a lateral vertical member and an intermediate horizontal member, and illustrates the means employed for securing the members together and also for securing a pane of glass to the sash. Fig. 8 is a perspective view of a portion of a top and a lateral member of the sash, and illustrates the means employed for securing them together and for securing a pane of glass to the sash. Fig. 9 is a partial sectional view of a sash embodying my invention, and is taken on the line 9—9 of Fig. 5. Fig. 10 is a fragmental sectional view of a sash embodying my invention, is taken on the line 10—10 of Fig. 5, and illustrates the means employed for securing two sashes together, for the purpose of forming a double sash. Fig. 11 is a perspective view of a clip which forms a detail of my invention. Fig. 12 is a perspective view of a window sash provided with a fireproof casing or frame, which forms a part of my invention. Fig. 13 is a partial sectional view along the line 13—13 of Fig. 12, and illustrates the method employed in securing the separate parts of the fireproof casing in place on the metal members of the window sash. Fig. 14 is a partial sectional view along the line 14—14 of Fig. 12. Fig. 15 is a partial sectional view along the line 15—15 of Fig. 12, and Fig. 16 is a perspective view of an intermediate spacer employed for holding the fireproof casing in place on its mounting member.

The sash illustrated as an embodiment of my invention includes horizontal and vertical members, which may be cut from rolled or stamped sections and are so formed that they may be fitted together in the assembling operation to form a rigid and strong metal sash.

The intermediate and vertical members are substantially T-shaped in cross section, and the flange 13 of each member is provided at each edge with a longitudinally extending flange 14, which projects at right angles to the flange 13 and parallel to the web 15 of the member. The web 15 is provided with apertures 16, located at the points of connection between the vertical members 12 and the horizontal intermediate members 17. The flanges 14 are provided with notches 18, which are located adjacent to and in line with the apertures 16. The apertures 16 are irregular in shape, their

perimeters corresponding in shape to the contour of the surface of the horizontal members 17.

The intermediate horizontal members 17, as illustrated, consist of a web 19, a base 20 extending at right angles to the web, an upwardly projecting flange 21 formed on the web adjacent to the base 20, and a downwardly projecting flange 22 formed on the free edge of the web. The base 20 projects considerably below the web 19, but only a short distance above it.

In assembling the intermediate horizontal and vertical members, the horizontal members are inserted into the apertures, 16 and are moved through the apertures, to the proper positions with reference to the vertical members. The apertures 16 are so located in the webs 15 of the vertical members, that the rear face of the base 20 of each horizontal member 17 contacts with the forward faces of the flanges 13 of the T-shaped vertical member, when the members are assembled. Each horizontal member is provided with locking lugs 23, which are located in pairs along the member, so that one lug of each pair is located on opposite sides of a vertical member, when the horizontal and vertical members are assembled. The lugs 23 are formed by partially severing longitudinally extending strips from the lower edge of the base portion 20 of the horizontal members, and then in bending the severed strips to abnormal positions, after the members are assembled, so that the severed ends of the strips engage the vertical members and prevent relative motion between the members. The vertical members 24, forming the lateral bounding members of the sash, are practically of the same construction as the intermediate members 12. The only differences are that the webs 15 of the members 24 are wider than the webs of the members 12, and the apertures, 25, which correspond to the apertures, 16, are rectangular instead of irregular. The top and bottom members 26 of each sash are somewhat different from the intermediate horizontal members 17, since they are substantially T-shaped in cross-section, the web 27 of the T-shaped member being the same width as the webs 15 of the members 24. The webs 27 of the top and bottom members 26 are provided with apertures, through which tongues 29, formed on the vertical members, project. The tongues 29 are provided with slots 30, in which wedges are located. The wedges 31 rigidly clamp the top and bottom members in place on the frame, when they are driven home. The horizontal members 17 are provided with tongues 22, which project through the apertures 25 in the lateral members 24, and are secured in place by means of the slot and wedge connection, illustrated. The top and bottom

members 26 are provided with lugs 33 and 34, which cooperate with the ends of the lateral members 24 and secure them in place.

The window panes 35 are secured in place in the separate frames formed by the intersecting members of the sash, as follows: The lower end of each pane 35 is inserted into the channel formed by the upwardly projecting flange 21 and the upwardly projecting portion of the base 20 of the member 17, which forms the base of the inclosing frame of the pane; the pane is then moved about its lower and supported edge, so that its upper edge contacts with the downwardly projecting portion of the base 20 of the member 17, which forms the top of the inclosing frame. The top and lateral edges of each pane are secured in place by means of clips 37, which perform the function of glaziers' brads. A clip 37 is illustrated in Fig. 11, and consists of an L-shaped piece formed of sheet metal, preferably tin, with one leg 38 longer than the other leg 39. Slits 40 and 41 are cut in the opposite edges of the leg 38, so that the corners of the piece may be turned at right angles, for the purpose of forming lugs for securing the glass in place. The slit 40 is located at a greater distance from the angle of the clip, so that the lug formed by it can be employed in securing a greater thickness of glass in place on the sash than the lug formed by the slit 41. The leg 39 of each clip is of substantially the same length as the distance between the flanges 14 and the webs 15 on the vertical members; and the leg 38 is of substantially the same length as the distance between the base 20 and the flange 22 on the horizontal members 17. The clips are secured in place on the vertical members by inserting the legs 39 into the channels formed between the webs 15 and the flanges 14 and then forcing the leg 38 against the web 15. The clips are secured in place on the horizontal members 17 by inserting the leg 38 into the channel formed between the base 20 and the flange 22 on each member 17, and then forcing the leg 39 into contact with the web 19. The clips are secured in place on the members before the panes 35 are located in place, and the glass-holding lugs are then formed on the clips by bending one corner or the other at right angles, so that the severed portion contacts with the face of the glass at the edge of the pane. After each pane is secured in place by means of the clips, it may be puttied in the usual manner. I preferably insert putty into the channels formed between the upper edges of the base portions 20 and the flanges 21 of the horizontal members, prior to inserting the lower edges of the panes into the channels. By this means, I am able to obtain a water-tight joint between the lower edges of the glass and the sash. The puttying operation covers the

clips, and consequently holds them in place. In removing the glass from the sash, the putty is removed in the usual way and the distorted corners of the clips are bent to their normal positions, so as to free the edges of the glass, and each pane of glass is then removed. The clips are removable and consequently may be withdrawn from their mounting channels, without in any way damaging either the clips or the sash. Drainage notches 42 are provided in the upper edges of the base portions 20 of the horizontal members, so that water which lodges on the sash between the bases 20 and the glass will drain out.

In Fig. 10, I have shown a sectional view illustrating means for securing an auxiliary or inner sash 43 on to the outer sash. The inner sash 43 is composed of intersecting vertical and horizontal members 44 and 45. The horizontal members 44 are substantially the same as the horizontal members 17 of the outer sash, the only difference being in the width of the web 19. The vertical members 43 are substantially the same as the vertical members 12 of the outer sash, and each member is provided with a slot 46 formed in the rear face of its flange, for the purpose of receiving the edge of a web 15 of one of the vertical members 12 in the operation of locking the inner sash in place on the outer sash. Brackets 47 are shown as integrally formed with the vertical members 44, and are provided at their ends with downwardly projecting lugs 48, which are adapted to project into apertures 49 formed in the web portions of the horizontal members of the outer sash, and to secure the inner sash in place. With this construction, the inner sash can be easily secured to the outer sash and can also be easily removed from it. The upper ends of the vertical members 43 of the inner sash are notched, as shown, at 50, so that the lugs 48 can be introduced into the apertures 49. The vertical and horizontal members 44 and 45 are secured together in the same manner as the intersecting members of the outer sash.

In the drawings, I have illustrated a heat insulating or fireproof frame, which is adapted to protect the metal members of the sash from heat which may be occasioned by a fire on the exterior of a building equipped with metal window sash.

The fireproof casing or frame, illustrated in Figs. 12 to 16 inclusive as an embodiment of a feature of my invention, consists of short channel-shaped pieces 51, adapted to be mounted on the backs or bases of the horizontal members 17; channel-shaped pieces 52, adapted to be mounted on the backs or bases of the horizontal members 15; and channel-shaped pieces 53, which form the bounding members of the fireproof frame, and are adapted to be mounted on the outer

or bounding members of the window sash. The flanges of each short-piece 51 are so formed at their edges, that they will engage the base portion 20 of the members 17, and the pieces are located in place on the members 17, during the operation of assembling the window sash. The ends of the pieces abut against the flanges 14 of the members 15 and may be cut so that they fit over the flanges. The edge of the lower flange of each piece 51 is pressed, or otherwise formed, so that it provides a longitudinally extending recess 54, which is adapted to receive the lower edge of the base portion 20 of one of the members 17. The edge of the upper flange of each piece 51 is so bent, or formed, that it engages the upper edge of the base portion 20 and coöperates with the recess 54 in holding the piece 51 in place on the base portion 20 of the member 17. In addition to this, spacers 55, illustrated in Fig. 16, may be located in the channel-shaped pieces 51, and by bearing against the base portion and against the inner face of the channel-shaped pieces, hold the pieces in place. The spacers may be located at desired distances apart along the base portions 20. The upper flange of each piece 51 is extended, so that it fits snugly against the adjacent face of the member 17, and so that it extends along and contacts with the lateral face of the projecting flange 21 of the member 17. The purpose of this construction is to prevent water from collecting between the flange and the mounting member. The pieces 51 abut at each end against the sides of the vertical pieces 52. Each piece 52 is secured to its supporting member 15 by bending over the edges of its flanges, so that each flange engages one of the flanges 14 of the mounting member. The spacing pieces 55 are located between the base portion of each member 15 and the piece 52, and by holding the piece outwardly, draw the bent over flanges into engagement with the flanges 14, and thereby secure the pieces in place. One flange of each of the horizontal members 53 may be notched out for the purpose of receiving the ends of the vertical members 52. The edges of the flanges of the horizontal pieces 53 are arranged to engage the base portions of the members 26 of the window sash, the arrangement being similar to that illustrated in Fig. 13, in connection with piece 52. One flange of each vertical member 53 is notched out to receive the ends of the pieces 51 and the pieces 53 are secured in place on the mounting members in the same manner that the pieces 52 are secured in place. The tops and the bottoms of the vertical members 53 are bent inwardly, so as to strengthen the member, and also to partially close the channel. Rods 56 extend longitudinally through the members 51, and are adapted to secure the separate pieces of the fireproof frame

together. The rods are held in place by means of nuts 57, which are threaded on to the ends of the rods, and are seated upon the outer flanges of the vertical members 53. By tightening up the nuts, the members 51 and 53 are locked securely together, and the members 52 are consequently held in place.

It will be apparent that the frame when in place on the window sash incloses the exposed portion of each metal member of the sash, and incloses the exposed portion in an air chamber, and, consequently, insulates it from heat, which may be occasioned by fire on the outside of the building, in which the window sash is located. In addition to this, the operative casing protects the metal members of the sash from rapid variations in the temperature, which might be occasioned during a fire by exposing the metal members first to the heat of the fire, and then to the temperature of the water employed in fighting the fire. The casing, therefore, protects the metal members and prevents warping of the members, and a resultant breaking of the glass with which the sash may be provided.

What I claim is:—

1. A metal sash for windows provided with clip-receiving channels, and glass-holding clips removably mounted in said channels and comprising L-shaped pieces provided with partially severed corners adapted to be bent to form lugs.

2. A metal window sash, comprising an inner sash and an outer sash, both of said sashes consisting of horizontal and vertical members, the horizontal members of the outer sash having inwardly projecting horizontal flanges and a series of perforations in said flanges, and the vertical members of the inner sash having outwardly projecting brackets adapted to enter the aforesaid perforations.

3. A metal window sash provided with a lower horizontal member having two upwardly projecting flanges adapted to receive the lower edge of a window pane, the outer flange being notched to drain water from the pane.

4. In combination with a metal window sash, a heat insulating frame comprising separate channel-shaped pieces, with their edges formed to engage the horizontal and the vertical members of the sash and means extending through and inclosed by the pieces for securing them together.

5. In combination with a metal window sash, a heat insulating frame comprising separate channel-shaped pieces, with their edges formed to engage the horizontal and the vertical members of the sash, and rods extending transversely of said frame for securing said pieces together.

6. A metal sash for windows provided with clip-receiving channels and glass-holding clips, removably mounted in the channels, each clip comprising an L-shaped metal piece provided with slits in its opposite edges and located at different distances from the angle of the clip, and forming partially severed portions adapted to be bent to form glass-holding lugs.

7. A metal sash for windows comprising intersecting members provided with clip-receiving channels, clips provided with legs of different lengths for engaging the channels and slits located in opposite edges of one of the legs and at different distances from the angle of the clip for partially severing the corners of the clip and forming lugs adapted to be bent into holding engagement with the glass.

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