

June 10, 1924.

1,497,516

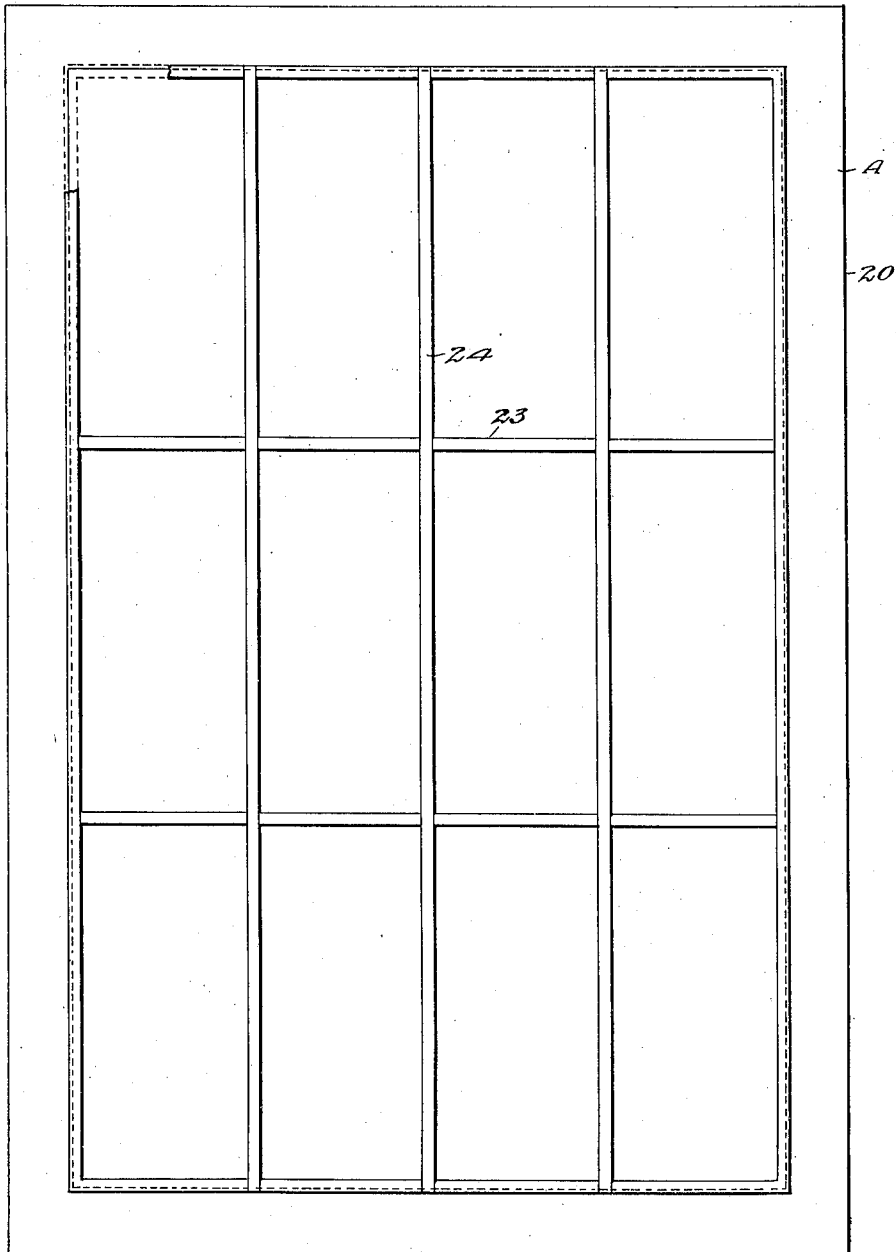
L. LANE

METAL SASH

Filed July 28, 1922

3 Sheets-Sheet 1

Fig. 1.



WITNESSES

William P. Goebel.
L. Macauliffe.

INVENTOR

Louis Lane

BY

Mumford

ATTORNEYS

June 10, 1924.

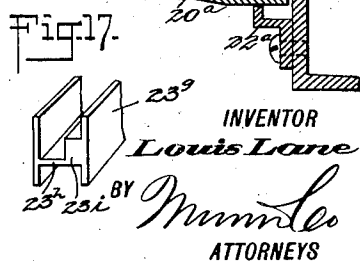
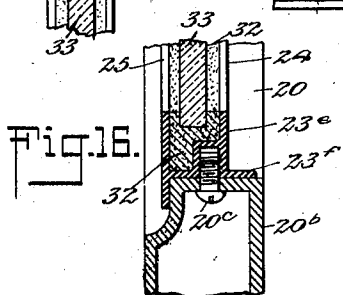
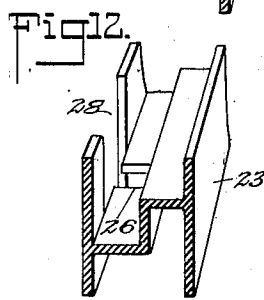
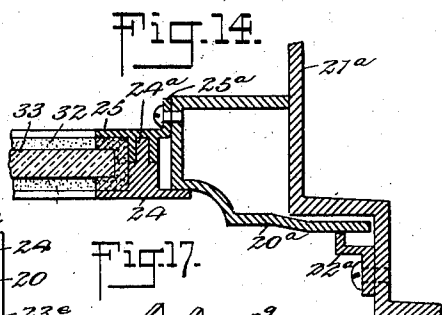
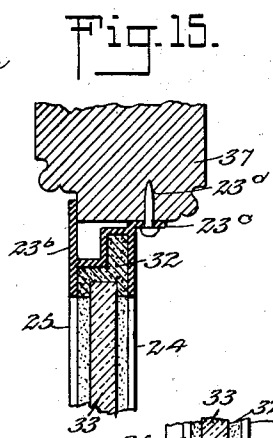
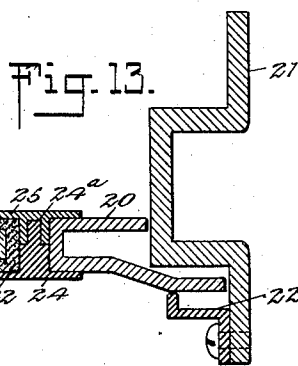
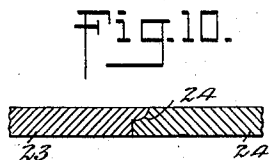
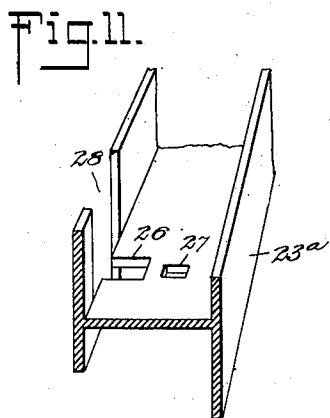
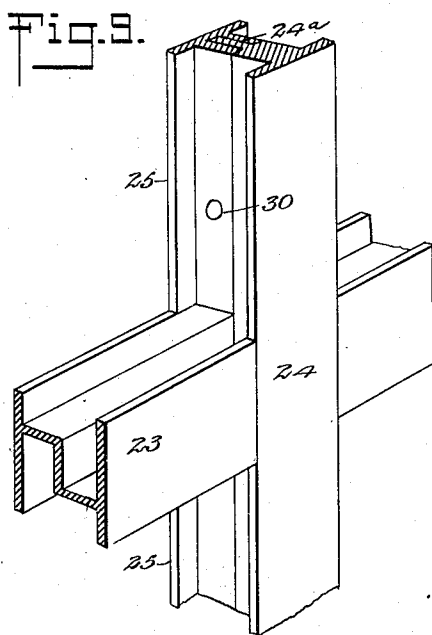
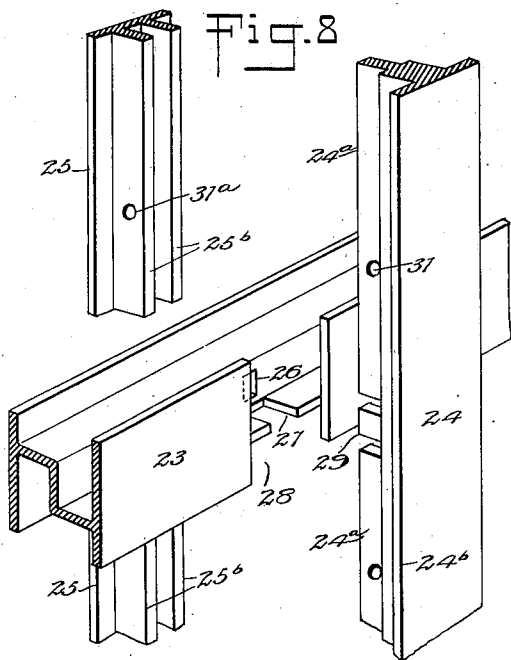
1,497,516

L. LANE

METAL SASH

Filed July 28, 1922

3 Sheets-Sheet 3



WITNESSES
William P. Goebel.
J. L. Meadiff.

INVENTOR
Louis Lane
BY Munnico
ATTORNEYS

UNITED STATES PATENT OFFICE.

LOUIS LANE, OF HABANA, CUBA.

METAL SASH.

Application filed July 28, 1922. Serial No. 578,097.

To all whom it may concern:

Be it known that I, LOUIS LANE, a citizen of the United States of America, and a resident of Habana, Cuba, have invented a new and Improved Metal Sash, of which the following is a description.

My present invention relates to an improved construction of metal sash for the type of windows wherein solid metal shapes produced by stamping, drawing, rolling, casting, or extruding, are employed.

The general object of the invention is to produce at low cost a durable solid sash of steel or other metal and of neat and agreeable appearance and of the maximum strength while using a minimum of metal so that such metal sash may by reason of the stated advantages come to be more generally employed than at present because of the rather crude, heavy and unpleasant features, or the very considerable cost of present forms.

A further important object of the invention is to provide a metal sash having cross bars and vertical bars or muntins so formed and arranged as to present rabbets of a character that when the sash is closed no putty will show on either sash face.

The means by which the above objects and others as will appear are attained will be readily understood from the following description.

Reference is to be had to the accompanying drawings forming a part of this specification, it being understood that the drawings are merely illustrative of one example of the invention.

Figure 1 is a front view of a metal sash embodying my invention;

Figure 2 is a fragment of the sash on an enlarged scale with parts broken away and in section;

Figure 3 is a horizontal section on the line 3—3, Figure 2;

Figure 4 is a horizontal section on the line 4—4, Figure 2;

Figure 5 is a transverse vertical section on the line 5—5, Figure 2;

Figure 6 is a vertical section on the line 6—6, Figure 4;

Figure 7 is a partly sectional front view showing the corner assemblage of the metal sash;

Figure 8 is a perspective view showing a fragment of a horizontal bar and the vertical elements showing the parts separated;

Figure 9 shows the parts illustrated in Figure 8 after assemblage;

Figure 10 is a detail in horizontal section given to show the joint between the front member of a vertical bar and adjacent vertical edge of a cross bar;

Figure 11 is a perspective view of the metal element employed for the formation of the cross bars in my improved structure showing said element before being bent to present a Z-shaped web;

Figure 12 is a perspective view of the element shown in Figure 11 in its final form with the web of the element of Z-shape;

Figure 13 is a fragmentary horizontal section taken through a side of the sash and sash frame and through the jamb of the window frame;

Figure 14 is a view similar to Figure 13 but showing the adaptation of my improved metal sash to a different form of sash frame and window frame;

Figure 15 is a detail in vertical section showing the form that may be given my improved horizontal sash bar at the head of the sash and also at the meeting rail;

Figure 16 is a detail in vertical section showing the connection of the bottom horizontal sash bar with the bottom rail of the sash frame;

Figure 17 is a perspective view of a modified form of cross bar.

In the illustrated example of my invention the sash is provided with a sash frame 20 extending about the same. The vertical side members of said frame 20 as shown in Figure 13 are generally of U-shape with one leg of the U extending beyond the other and adapted to lie at a side of the jamb 21 of a window frame within a stop 22 as fully set forth in an application filed by me August 23, 1922, Serial No. 583,750. Said vertical side member of the sash frame 20 is adapted to be received between the outer member 24 and the inner member 25 of the sectional vertical bars entering into my invention. In the form shown in Figure 14 the vertical side member 20^a of the sash frame has one side extended to lie at a side of a jamb 21 of a window frame with-

in a stop 22^a on said member 20^a instead of being received between the flanges presented by the outer and inner vertical members 24, 25 of the vertical sash bars and is formed to lie against the inner surface of the flange of the T-shaped outer member 24 and to be secured to a right angle flange 25^a on the inner sections 25 of the adjacent vertical sash bar.

The horizontal sash bars 23 are made from structural elements 23^a of approximately H-shape in cross section as shown in Figure 11, one flange of the structure elements extending farther from the web at one side than at the other and the opposite flange is reversely disposed, that member of the flange extending the shorter distance from the web being at the opposite side of the web from the short member of the first flange so that the longitudinal side edges of the respective flanges are out of alignment for the purpose of bringing the side flanges of the bar 23 into alinement as in Figure 12 by bending the web so that its opposite side edge portions are in different planes and connected by an intermediate member at approximately right angles, the result being a web of approximately Z-shape, the web being hereinafter referred to as of general Z-shape.

Each horizontal bar 23 has a cut-out 28 in the outer flange, said cut-outs 28 accommodating the front of the vertical members 24 so that the front surface of the vertical bar and the front surface of the horizontal bar 23 will be in the same plane. In addition to the main cut-outs 28 in the horizontal bars 23 there is a cut-out 26 in the web at the cut-out 28 and there is a hole 27 preferably rectangular in the intermediate member of the Z-shaped web. The outer members 24 of the vertical bars are T-shape in cross section as stated, the stem of the T presenting a terminal 24^a of reduced thickness so as to be received between spaced vertical flanges 25^b on the inner side of each inner bar section 25 of the vertical sash bars or muntins, said sections 25 thus being of double T-form in cross section. The sections 25 abut against the top and bottom edges of the horizontal bars 23 when the members 24, 25 are brought together and inter-engaged with the horizontal bars 23. The reduced edge terminal 24^a of the vertical bar members 24 are slotted to produce rectangular studs 29 each adapted to enter a hole 26 in the horizontal bar 23, the end of each stud lying against the outer flange of the horizontal bar 23 and in practice welded or otherwise fastened to said horizontal bar.

In practice the members 24 are placed in position in association with the horizontal bars 23 while the glass panes 33 are being placed and the members 25 are put in posi-

tion after the glazing operation. Without the members 25 the members 24, it will be observed, present a double rabbet for the reception of the glass. An important advantage of the Z-shaped web 35 is that a channel is formed at the top and bottom of the space for each window pane. The channel at the bottom has a width to accommodate the lower edge of the glass 33 temporarily so that the glass may be placed by dropping it into the bottom channel of the horizontal bar and after the glass has been brought into the plane of the sash frame the glass may be lifted into the channel of the top horizontal bar after which the elements 34 are placed in position to center the glass.

With the outer and inner members 24, 25 of the vertical sash bars assembled in association with a horizontal bar 23, said front and back members will lie in the front and rear planes of the horizontal bar and will be positively secured to the horizontal bar through the medium of the studs 29. With the terminal edge 24^a between the flanges 25^b of the inner sections 25, pins 30 are passed through registering holes 31, 31^a in the reduced part 24^a and in the flanges 25^b.

The vertical bars as described when assembled present vertical side channels. The channels accommodate the side edges of the glass 33 and said side edges are embedded in putty as indicated at 32 in the channels presented by the vertical sash bars. The arrangement is such that the putty 32 does not present a front surface nor a rear surface and is not apparent. The top and bottom edges of the glass 33 are accommodated in the channels of the horizontal bars 23 as shown in Figure 5. Said channels of the horizontal bars 23 may have clips, one of which is shown at 34 in Figure 5, the clips being generally of V-shape to present a vertical member lying along one vertical surface of the channel and the other extending obliquely inward beneath the glass 33. Both legs of the V-shaped clip are directed laterally inward on approximately horizontal lines, the one terminal, 35, lying beneath the glass 33 and the other terminal, 36, presenting its end to a side surface of the glass so that the clip centers the glass in the channel of the horizontal bar 23, the putty 32 completing the securing of the glass. In Figure 17 the web 23^b of cross bar element 23^a, the equivalent of element 23, is thickened at 23ⁱ instead of being bent bodily to Z-form. The element 23^a is produced by extrusion.

As shown in Figure 10 the vertical side edges 24^b of the outer members 24 of the vertical sash bars overlap the opposed side edges of the horizontal bars 23 at the cut-outs 28 in the preferred construction and practical carrying out of the invention and

the overlapping portions have opposed curved surfaces, all as will clearly appear from Figure 10.

In Figure 15 the horizontal member 37 may be taken as representing either the top rail of an upper sash having a wood sash frame or may represent the meeting rail of the lower sash. To secure the top horizontal bar 23^b to the element 37, one flange member 23^c of the bar 23^b is directed horizontally to receive nails or other fasteners indicated at 23^a and entering the element 37.

As shown in Figure 16 the bottom horizontal bar 23^c is secured to the bottom bar 20^b of the sash frame by screws 20^c entering threaded sockets in the under side of the bar 23^c. Said bottom sash bar 23^c has one of its flanges directed horizontally in the form of a foot 23^d to lie on top of the sash frame bar 20^b.

I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention, I do not limit myself strictly to the exact details herein illustrated, since, manifestly, the same can be considerably varied without departure from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. A metal sash including cross bars and vertical bars, the cross bars having inner and outer vertical flanges, and a connecting web, the opposite side portions of which web are offset from each other in different planes and united by an intermediate member at approximately right angles thereto, giving the web approximately a Z-shape in cross section, said vertical bars being composed of outer members extending continuously through the several cross bars and the inner members of said vertical bars being composed of separate sections, adjacent sections being separated by said cross bars; together with studs on the vertical bars extending through the intermediate portions of the webs of the cross bars and having the ends of said studs secured to the cross bars.

2. A metal sash including cross bars having side flanges disposed in vertical planes and an approximately Z-shaped web connecting said flanges, and vertical bars having studs thereon extending laterally through said webs and having their terminals fixedly secured to the adjacent flanges of the cross bars.

3. In a metal sash, cross bars presenting flanges at the front and back disposed in vertical planes, the flanges at one side having cut-outs, and vertical I bars, formed of separate inner and outer vertical face members, said members formed with overlapping shanks, one outer surface of which is

in the plane of adjacent flanges of the cross bars, said cross bars at the cut-outs and the adjacent side edges of the vertical bars overlapping.

4. In a metal sash, horizontal bars presenting flanges, one of the flanges on the top cross bar of the sash being directed laterally approximately at right angles and beyond the general plane of the adjacent face of said top cross bar and affording means to secure said bar to the horizontal top member of a sash frame.

5. In a metal sash, cross bars presenting side flanges disposed in vertical planes, and a connecting web presenting an approximately central vertical portion, said vertical portion having transverse holes therein, one of the flanges of each cross bar having cut-outs therein and there being smaller registering cut-outs in the adjacent edge of the web at said flange cut-outs, vertical bars composed of separate inner and outer members, one of which is T-shaped in cross section, the stem of which presents a terminal edge portion of reduced thickness, said stem having portions thereof in the form of studs adapted to enter said transverse holes in the web, the front of said T-shaped vertical member being accommodated in the flange cut-outs of the cross bars and the adjacent portions of the stem being accommodated in the web cut-outs.

6. In the method of forming the cross bars for metal sashes, producing a structural element comprising side flanges and a web connecting the flanges and disposed in a single plane and presenting an opening to receive a member on a vertical bar, then bending the web of said element to displace the flanges by a parallel movement and dispose the portion of said web having the said holes in a plane at approximately right angles to the original plane of said web.

7. A metal sash including channeled cross bars and vertical bars presenting channels affording accommodation for the edge portions of the window glass, said channels also affording space for putty at both sides of the glass and within the planes of the open sides of the channels; together with centering devices in said channel for the glass, said devices being disposed at a side of the channel and presenting lateral members one of which lies between the channel and the edges of the glass, and the other of which lateral members lies with its end against the glass.

8. A metal sash having cross bars and having vertical bars formed of inner and outer attachable members the one of which members of the vertical bars is T-shaped in cross section to present rabbets for the reception of glass prior to the placing of the other members of the vertical bars.

9. In a metal sash, horizontal bars comprising flanges at the front and back, and a connecting web, the webs of said bars presenting a channel adjacent to a flange of the bars into which channel an edge portion of a pane of glass may be temporarily accommodated.

10. In a metal sash, horizontal bars comprising front and back flanges, and an ap-

proximately Z-shaped web connecting said flanges between the edges of the latter, said webs presenting channels adjacent to one flange, the channels being of a width to temporarily accommodate an edge portion of a pane of glass for facilitating the placing of the glass in a frame.

LOUIS LANE.