E. A. SANDERS.

METAL WINDOW SASH.

APPLICATION FILED OCT. 7, 1907.

1,004,545.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.

FIG. 1.

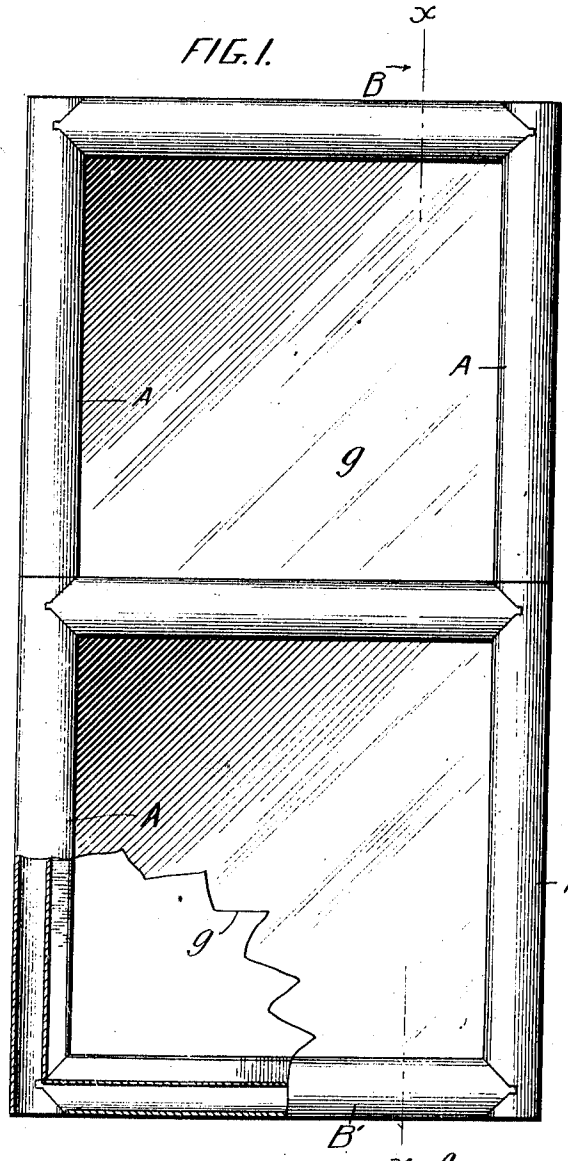
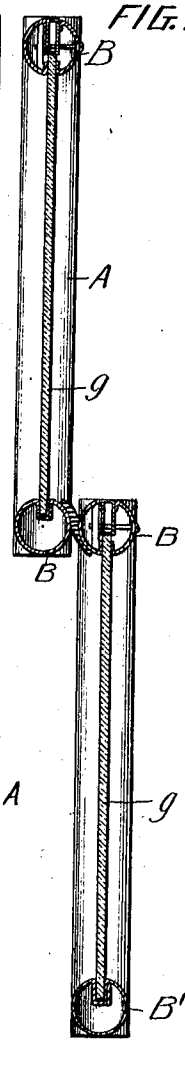


FIG. 2.



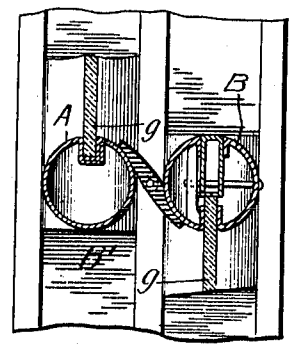


FIG. 3.

FIG. 4.

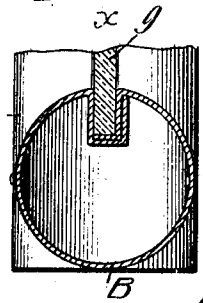
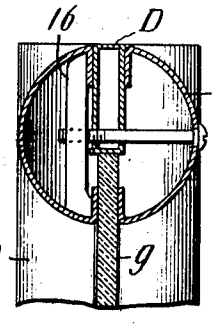


FIG. 5.



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2 SHEETS—SHEET 2.

Fig. 8

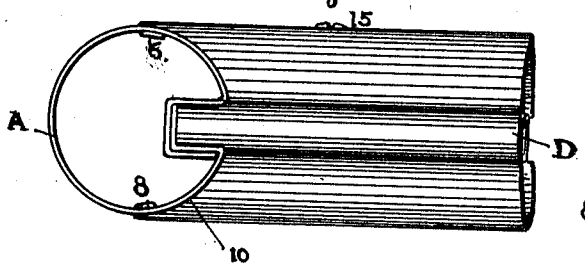


Fig. 12

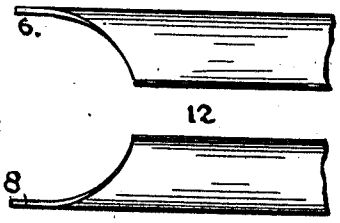


Fig. 6

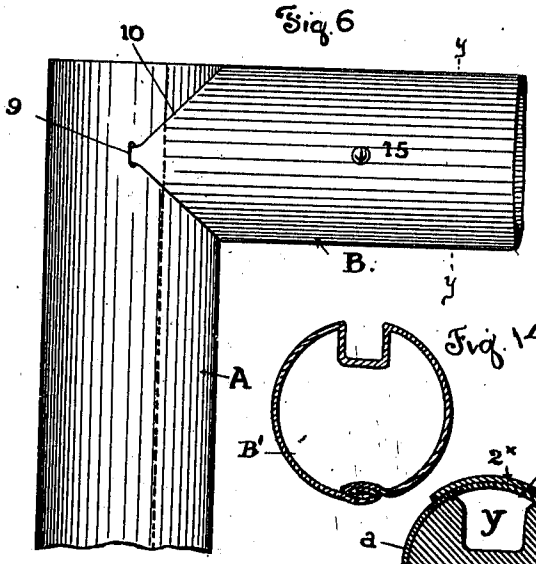


Fig. 9b Fig. 9 Fig. 9a

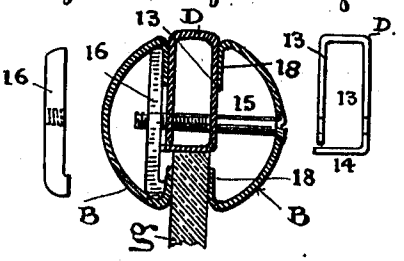


Fig. 14.

Fig. 11

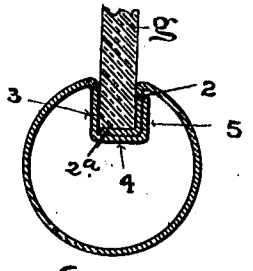


Fig. 10

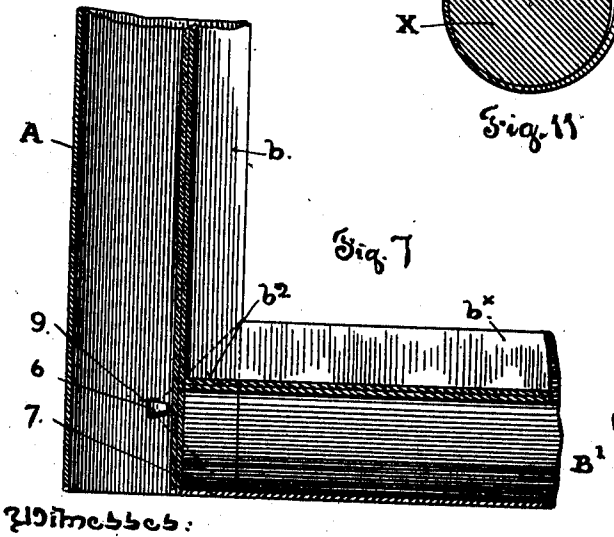
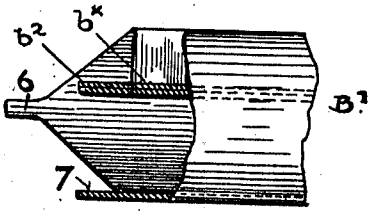


Fig. 7

Fig. 13



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UNITED STATES PATENT OFFICE.

EDWARD A. SANDERS, OF SAN FRANCISCO, CALIFORNIA.

METAL WINDOW-SASH.

1,004,545. Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed October 7, 1907. Serial No. 396,201.

To all whom it may concern:

Be it known that I, EDWARD A. SANDERS, a citizen of the United States of America, resident of the city and county of San Francisco and State of California, have invented new and useful Improvements in Metal Window-Sash, of which the following is a specification.

This invention relates to improvements made in rails and stiles for the construction of sheet-metal window-sashes.

The invention consists, chiefly, of a sheet-metal sash-stile in which the edges of the sheet-metal strip are united by an interlocking joint of novel construction, and having a groove to receive the sash so formed as to confine the glass on both sides of the pane. This feature of the invention is applicable, also, to the construction of the bottom-rail and the top-rail of the sash.

The invention consists further in a tubular sheet-metal sash of novel construction having a top-rail with a slot extending vertically and longitudinally through it, for inserting the glass-pane from above, and a removable closing-strip having the two-fold function of confining the glass in place and of closing the slot in the rail.

The invention consists further in a novel manner of uniting the stiles and rails together at the corners without the use of corner-posts, or blocks. In this feature of the invention, the parts or members are so arranged that they serve to hold and retain the glass-pane in place without other fastening means than the usual putty or cement; and the parts composing the joint are in turn held in together by the glass and are prevented from springing apart or becoming separated after the glass is set.

The nature of these improvements and the manner in which I proceed to produce, apply and carry out the same in the construction of a sheet-metal window-sash, are explained at length in the following description in which reference is had to the accompanying drawings forming part of this specification.

Figure 1 of the drawings represents in front-elevation a metal-window sash in which the stiles and rails are formed or constructed and joined together according to my invention. Fig. 2 is a longitudinal sectional view, on the line x—x, Fig. 1. Fig. 3 is a transverse section, on an enlarged scale, of the bottom-rail of the top-sash and the top-rail of the bottom-sash in their relative position when the sashes are closed; showing a closing-strip of novel form placed between the adjacent rails for closing the opening between them. Fig. 4 is a transverse section through the bottom-rail, and Fig. 5 a similar section through the top-rail, both on an enlarged scale. Fig. 6 is a front-elevation, also on an enlarged scale, of a portion of the left stile and the top-rail joined to it. Fig. 7 is a longitudinal section through the lower portion of the left stile, and the bottom-rail joined to it. Fig. 8 is a top-view of Fig. 6. Fig. 9 is a transverse section taken diametrically through the top-rail on the line y—y, Fig. 6. Fig. 9^a is an end view of the closing-strip in the top-rail. Fig. 9^b is a detail of the bridge-piece for the screw-bolt by which the parts of the top-rail are drawn together and fastened. Fig. 10 is a cross-section taken diametrically through the stile or the bottom-rail, showing the glass set in the groove. Fig. 11 illustrates one way in which the joint is made, and the groove for the glass formed in the stile and the bottom-rail. Fig. 12 is a top-view in detail of the parts composing the top-rail before they are joined to the stile. Fig. 13 is a side-view of the bottom-rail before it is united to the stile. Fig. 14 illustrates another way in which the edges of the sheet-metal are joined together and the groove for the glass is formed.

The tubular rail or stile of my invention is produced by bending a strip of sheet-metal a, into a cylindrical shape around a former X (see Fig. 11) and in or by the same operation uniting the edges of the strip by overlapping and bending them at right angles in such manner as to interlock the two edges and also form a groove or channel of rectangular shape in cross-section from end to end of the tube. This operation is best carried out or performed by bending the strip a around the former X in which is a channel y, and lapping the edges 2^x—3^x one upon the other, so that they will lie over the channel y, and then forcing the said overlapping edges of the metal strip into the channel thereby forming the groove b^x in which the edge of the window-glass is set. The edges of the metal strip are thus bent into angular shape and these parts are interlocked by virtue of the members 4—5 of one of the angularly bent edges over lapping and extending around the members 2—2^a of the other angularly bent edge so that it be-

comes impossible for the joint to spread or to be sprung apart when the glass is introduced and forced in place in the groove, even under conditions where the glass may vary in thickness. Another advantage attained by this construction of joint is that the interlocking members are pressed tightly together, and are also so covered by the glass that the putty or cement which is ordinarily used to fix the glass in the sash may in most cases be dispensed with when a thoroughly water-tight joint is desired. The small quantity of cement that will be required for that purpose can readily be applied between the glass and one side of the groove to fill the crevice. Another advantage in this joint is that it will take glass panes of different dimensions in thickness, and will accommodate itself to slight variations in the thickness of the glass, without affecting the strength or the tight character of the joint; as the greater the pressure of the glass against the sides or the bottom of the groove, the closer will the members 2^a—4 or 2—5 be pressed together.

Sufficient metal being provided for the lap, the two thicknesses that lie over the channel are pressed down into it by any proper means, such as a plunger or bar of the required rectangular shape in cross-section, and of proper length to fill the channel from end to end, with the result to bend the portion 3^x at right angles and form the three members 3—4—5, and at the same time bend the overlapping portion 2^x twice at right angles, and thereby form the two membered hook or angularly bent edges of the strip 2—2^a. The hooks thus form the sides and the bottom of the channel or groove b^x.

The stile A and the top-rail B and bottom-rail B^1 are joined together according to the manner of forming and uniting the ends illustrated in Figs. 6, 7, 8, 9, 10, 12 and 13. The end of the rail is cut on a bevel on the top and bottom sides at equal angles leaving the tangs or narrow strips 6—8 on the ends, and the lip 7 on the bottom. Slits 9 are cut in the stile on diametrically opposite sides to admit the tangs 6—8, and the last named parts being inserted from the outside are clenched on the inside, as seen in Figs. 7 and 8—after which the joint is finished by soldering or brazing the parts along the seams 10 where the beveled edges meet the sides of the stile.

The lip 7 on the bottom of the rail should fit the groove in the stile, so as to close the groove at the end, and a tight joint is produced at that point by soldering the lip in place.

This construction gives a strong and a stiff joint without the use of separate corner-posts or angle-pieces.

As the parts are put together in a permanent manner and the sash is finished before the glass is set, the form of the groove obviously requires some provision for inserting the glass from above through the top-rail, so that it can be entered and pressed down into place in the grooves of the stiles and the bottom-rail. For that purpose the top-rail is formed according to the manner illustrated in Figs. 9–9^a–9^b, in which the top-rail is composed of two separate curved halves or segments joined together by bridge-pieces 16 on the inside of one segment, and screws 15 which are inserted from the outside through the opposite segment and the bridge-piece opposite; that part being threaded to take the ends of the screws or bolts. The edges of each segment are turned inwardly, and the segments are held by the screws at proper distance apart to admit the glass between them.

When the glass is inserted and pressed down in the sash, the closing-strip D filling the opening above the glass is secured in place between the members of the rail by the screws 15, which fasten the two members together. The closing-strip D is best formed by bending a strip of sheet-metal in the shape of a rectangular tube, with the parallel sides 13 placed at proper distance apart to fit closely against the inwardly-turned ends along the top sides of the rail-members, and being of such length also that the bottom 14 of the closing-strip will rest on the top of the glass.

This construction has the effect to unite the members of the top-rail rigidly and hold the glass in place.

The modification illustrated in Fig. 14 in which the groove to admit the glass pane is formed in the rail at a point diametrically opposite the joint 20 which united the edges of the tube, is adapted more particularly for a heavy rail or stile of relatively large diameter, where the curvature of the tube will permit the forming of a flat joint on the external face of the tube. The construction illustrated in Figs. 10 and 11 is better adapted for a rail or a stile of relatively small diameter, for the reason that it enables the joint to be situated wholly within the groove, thereby leaving the external surface of the tube smooth or unbroken particularly along the portion which fits and travels in the window-frame.

I do not in this case claim a window sash having a stile or rail formed of a strip of sheet metal having inturned portions extending longitudially of the strip, and the opposite edge portions thereof overlapping, and being disposed at right angles to one of the inturned portions, whereby there is formed a groove or recess for the glass such as illustrated in Figs. 4, 8 and 10 of this case, as such subject-matter is claimed in my application, Patent No. 897,414 dated September 1, 1908.

Having thus described my invention, what I claim is:—

1. In a metal window-sash, a top-rail comprising two separate segments having inwardly-turned edges, a removable closing-strip between said segments adapted to maintain the segments at uniform distance apart and to close the opening along the top after the glass is inserted, a bridge piece mounted within one segment and means engaging with the said bridge-piece and with the other segment for drawing the segments together against the sides of the glass.

2. In a metal window-sash, a top-rail comprising two separate segments having inwardly-turned edges, a removable strip between said segments adapted to maintain the segments at proper distance apart to permit the insertion of the glass-pane between them, said strip also closing the space between the rail members along the top, a bridge-piece arranged behind the inturned edges of one segment and means engaging with the said bridge-piece and with the other segment for drawing the segments together and securing the said closing-strip in place.

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