May 1, 1923.

1,453,822

M. ZEMAN

STEEL SASH CONNECTION

Filed July 23, 1921

Fig. 1.

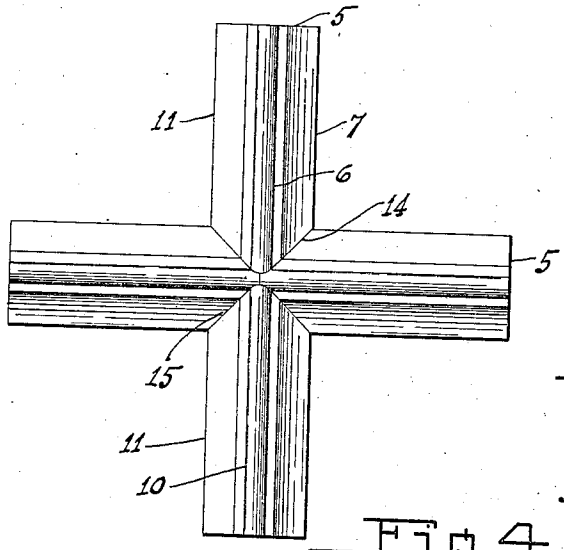


Fig. 2.

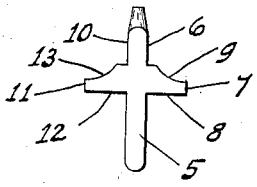


Fig. 3.

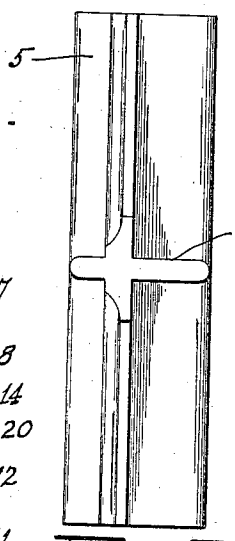


Fig. 4.

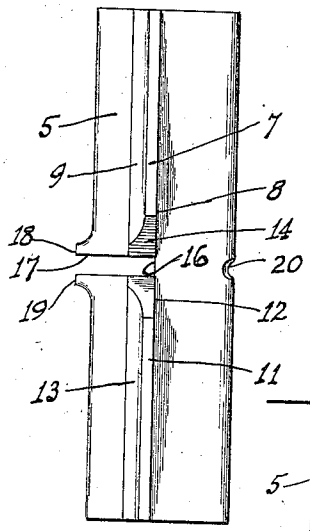


Fig. 5.

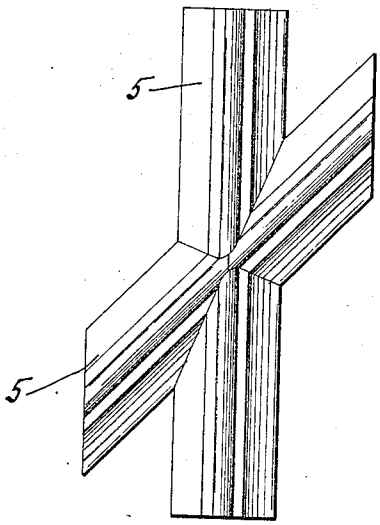
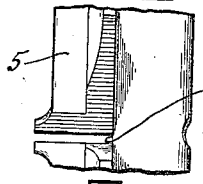


Fig. 6.



Inventor

Mathew Zeman

By Watson & Coleman Attorneys

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UNITED STATES PATENT OFFICE.

MATHEW ZEMAN, OF CLEVELAND, OHIO.

STEEL SASH CONNECTION.

Application filed July 23, 1921. Serial No. 487,047.

To all whom it may concern:

Be it known that I, MATHEW ZEMAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Steel Sash Connections, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to metallic sash connections and has for its object to provide a connection wherein the bars or rails of the sash may be firmly interlocked without requiring the connection to be welded or the sash to be cast in one piece.

It is another object of the invention to provide a connection of this character wherein the means for locking the bars or rails of the sash in engagement with each other is formed integral with or carried by each rail.

It is another object of the invention to provide a connection of this character wherein each strip or bar is provided with oppositely extending right angular flanges, the flanges of each bar being adapted to engage the flanges of the adjacent bar whereby oscillating movement of the bars in their connected positions is prevented.

It is also an object of the invention to provide a connection of this character comprising bars having slots, the end walls of said slots being adapted to engage each other to hold the bars in interlocking relation, each bar adjacent the open ends of the slots being provided with means adapted to lock said bars in their interlocking relation by closing the ends of the slots.

It is a further object of the invention to provide a sash connection of this character wherein the means for locking the bars in interlocking relation serves to form a continuation of each bar, and to eliminate the trace of a connection and to give the appearance of a cast connection.

It is still a further object of the invention to provide a connection of this character wherein the connection may be constructed to lock the bars at various angles with respect to each other to permit the formation of various designs in sash construction.

With these and other objects in view the invention consists in the improved construction and arrangement of parts to be hereinafter more particularly described, fully claimed and illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a window sash connection constructed in accordance with an embodiment of the invention,

Figure 2 is an end view of the bar used in the construction of the sash,

Figure 3 is an end elevation of the structure shown in Figure 1,

Figure 4 is a side elevation of one of the bars,

Figure 5 is another form of the invention showing the connection made at a different angle, and

Figure 6 is a fragmentary detailed view of one of the bars disclosed in the structure of Figure 5.

Referring to the drawings, 5 designates a bar used in sash construction, said bar being relatively broad and made in various lengths, according to the size and design of window sash desired. As all of the bars of the sash are similar in construction, the description of one will suffice for all.

Each bar has projecting from its face 6 a flange 7, said flange having a flat face 8 and a substantially concave and beveled face 9. Projecting from the opposite face 10 of the bar, is a flange 11 having a flat face 12 and a substantially beveled and concave face 13. Each of the flanges 11 and 7 are disposed at right angles to the faces 6 and 10 and also to one side of the longitudinal center of the bar 5. These flanges cooperate with the bar to form a frame for the reception of window glass. At spaced intervals, longitudinally of the bar 5, the flange 7 is cut away to provide substantially V-shaped recesses 14, which terminate at the face 6 of the bar. The flange 11 is likewise cut away to provide a substantially V-shaped recess 15, said recess terminating at the face 10 of the bar. By means of the V-shaped recesses, the confronting ends of the flange 6 at said recesses are beveled so as to cooperate with the other bars of the sash to form the mitered corners of the sash.

The bar 5 is provided with a plurality of slots 16, said slots corresponding in thickness to the thickness of the bars and extending from one longitudinal edge of the bar to a point beyond the intermediate center, or in other words, terminating at the faces 8 and 12 of the flanges 7 and 11 so that a rela-

tively long slot is formed, the slot being open at its end 17. Projecting from the bar 5 at the open end 17 of the slot are extensions 18 and 19, said extensions being disposed in the plane of the side or longitudinal walls of the slot and are also disposed at right angles to the longitudinal edge of the bar. In the construction of the sash, the slots 16 are disposed in alternate relation, or in other words, every other slot is disposed in the opposite longitudinal edge of the bar so as to render the bar substantial.

In assembling the sash, the bars are so positioned that the slots are disposed in confronting relation. The slotted portions of the bars are then moved toward each other so that the portions of the bars adjacent the end walls of the slots are received into the slots, movement of the bars laterally of each other being limited by contact of the end walls of the slots with each other. By this means, one of the bars is disposed at right angles to the adjacent bar by means of which the window pane frames are formed. It will be noted that the end walls of the slots are disposed substantially in the plane of the faces 8 and 12 of the flanges 7 and 11 so that when the end walls come in contact with each other the V-shaped recesses will receive the beveled ends of the flanges 7 and 11. By this means, the beveled and concave faces 9 and 13 of the flanges substantially register so that an unbroken channel or design is provided in the window pane frame. Furthermore, the beveled ends of the flanges formed by the V-shaped recesses are adapted to engage the beveled ends of the adjacent flanges and in this way serve as braces to prevent oscillating movement of the bars. The edge of each bar remote from the extensions 18 and 19 and immediately beneath the end walls of the slots is provided with a pair of concave recesses 20. These recesses are adapted to be disposed immediately beneath the extensions when the bars 5 are disposed in interlocking relation. After the bars have been positioned as above described, the fingers or extensions 18 and 19 are forced toward each other and into the recesses 20, considerable pressure or force being applied to said extensions so that they are forced into frictional engagement with each other and substantially form a continuation of the broken edge of the bar caused by the slots so that the connection is not visible. Furthermore, the extensions also serve to close the open ends of the slots so that movement in either direction of either bar is impossible, and oscillating movement is prevented by the flanges 7 and 11.

As disclosed in Figures 5 and 6, the bars may be disposed in interlocking relation at various angles. This is possible by providing a slot 16[a] which extends obliquely of the bar. In this event, the V-shaped recess is omitted and one end of the flange 11 disposed flush with the adjacent inner face of the slot. The confronting or opposite edge of the flange 11 is inclined outwardly a slight degree and in divergent relation to the opposite inner face of the slot. The bars are thereby made to interlock at various angles, or at any angle up to 45°. In this way various designs may be formed without destroying the usefulness of the connection. Regardless of the angle of the slots and flanges, each bar is provided with the usual extensions for locking the bars in interlocking relation.

From the foregoing it will be readily seen that this invention provides a novel connection particularly adapted for steel sash construction, wherein the bars of the sash may be connected without casting or without requiring screws or separate fastening means. Another important feature is that the means for holding the bars locked in their interlocking relation is carried by each bar and cannot be unlocked unless the bar is mutilated. Furthermore, the construction of all the bars is exactly the same, regardless of the fact that they are intended to interlock and one bar is disposed at right angles to the other.

What is claimed is:—

1. A joint of the character described comprising a pair of strips, one of said strips having a slot extending inwardly from its front longitudinal edge, another of said strips having a slot extending inwardly from its rear longitudinal edge, the rear longitudinal edge of the first mentioned strip and the front longitudinal edge of the second mentioned strip having small recesses, the front longitudinal edge of the first mentioned strip and the rear longitudinal edge of the second mentioned strip having extensions extending therefrom adjacent the slot of each strip, said slots permitting interengagement of the strips with each other whereby the extensions project respectively beyond the front longitudinal edge of the second mentioned strip and the rear longitudinal edge of the first mentioned strip, the extensions being adapted to be forced into the recess of the adjacent strip.

2. A joint of the character described comprising a plurality of strips, one of said strips having a slot extending inwardly from its front longitudinal edge, another of said strips having a slot extending inwardly from its rear longitudinal edge, the rear longitudinal edge of the first mentioned strip and the front longitudinal edge of the second mentioned strip having small recesses disposed substantially in alignment with the inner walls of the slots of the strips, the front longitudinal edge of the first mentioned strip and rear longitudinal edge of

the second mentioned strip having extensions extending therefrom on each side of the slot of the strip, each extension having one face thereof disposed flush with the adjacent inner wall of the slot and substantially forming a continuation of the side walls of the slot, said slot being adapted to permit interengagement of the strips with each other whereby the extensions of the first mentioned strip project beyond the front longitudinal edge of the second mentioned strip, and the extensions of the second mentioned strip project beyond the rear longitudinal edge of the first mentioned strip, the extensions of each strip being adapted to extend toward each other and into the recess of the adjacent strip whereby the extensions of each strip substantially coact with the slot to provide a socket for the adjacent strip.

In testimony whereof I hereunto affix my signature.

MATHEW ZEMAN.