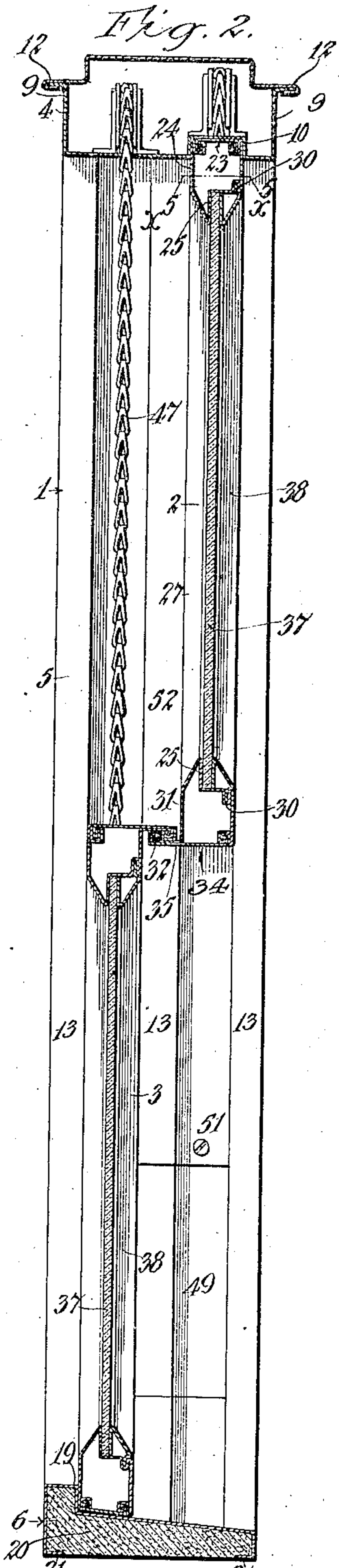
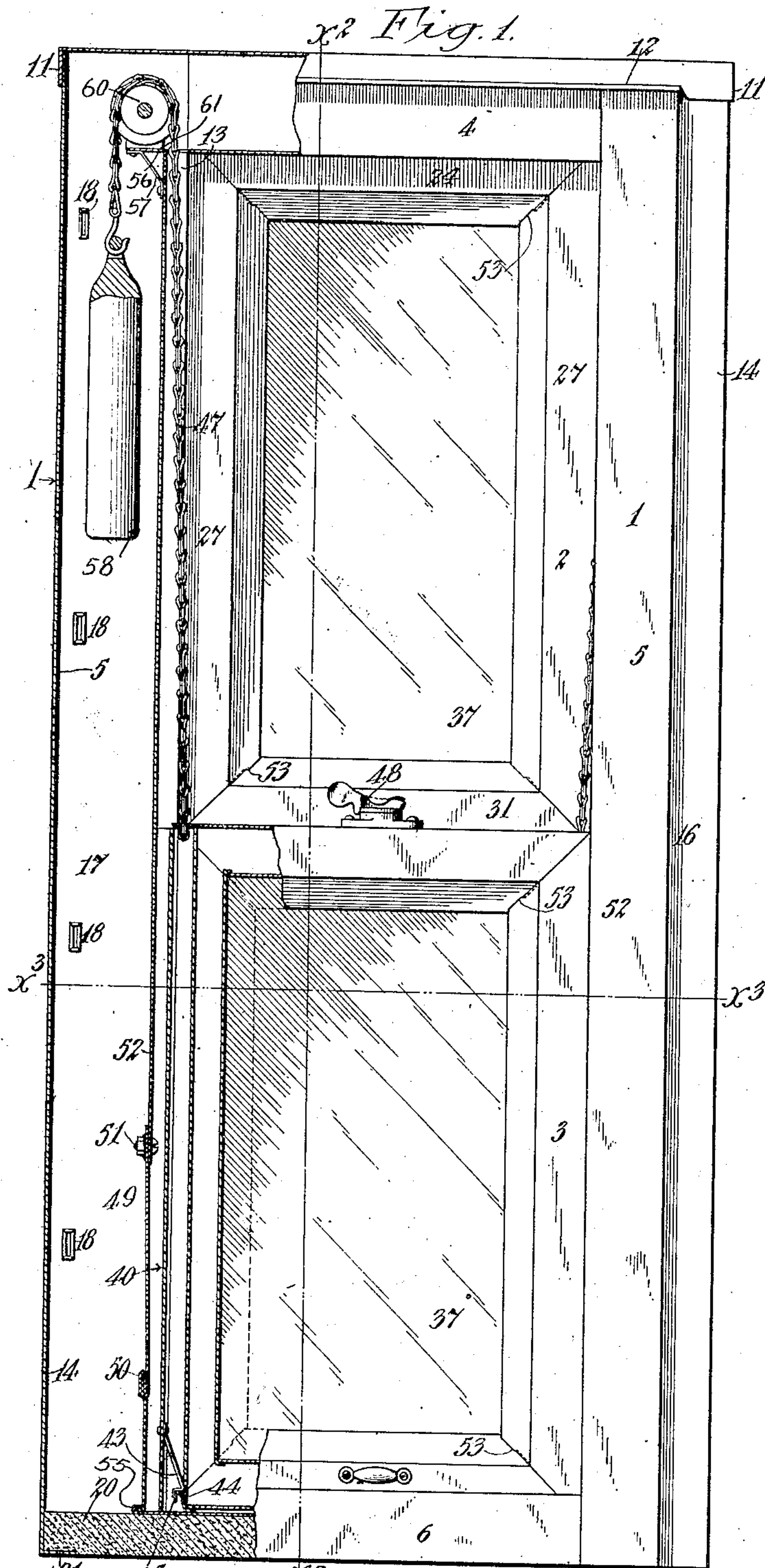


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FIREPROOF WINDOW CONSTRUCTION.  
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918,213.

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2 SHEETS—SHEET 1.



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# UNITED STATES PATENT OFFICE.

JOSEPH C. SPECHT, OF LOS ANGELES, CALIFORNIA.

## FIREPROOF WINDOW CONSTRUCTION.

No. 918,213.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed April 4, 1907. Serial No. 366,458.

*To all whom it may concern:*

Be it known that I, JOSEPH C. SPECHT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Fireproof Window Construction, of which the following is a specification.

This invention relates to the frame and sash of windows, and its object is to provide a construction for this purpose which will be absolutely fireproof.

A further object of the invention is to provide a window construction wholly of sheet metal, the various members of the sash and frame being of hollow metal construction, and an object of the invention in this connection is to provide such a construction which will obviate the use of soldered joints or rivets, or wood in any constructive part thereof.

Another object of the invention is to provide means for facilitating the assembling of the sashes in the frame.

Another object of the invention is to provide means for facilitating the assembling of weights in the frame.

In the accompanying drawings:—Figure 1 is an elevation, partly in section, of the frame and sashes. Fig. 2 is a vertical section thereof on the line  $x^2$  in Fig. 1. Fig. 3 is a horizontal section on the line  $x^3$  in Fig. 1. Fig. 4 is an enlarged horizontal section of one of the side members for the frame. Fig. 5 is a horizontal section of a sash on line  $x^5$  in Fig. 2. Fig. 6 is a horizontal section of the removable sash stop. Fig. 7 is an enlarged horizontal section of the various parts constituting one vertical side member of a sash in separate order, this figure also showing a portion of the glass plate for insertion in said side member. Fig. 8 is an enlarged vertical section of the upper portion of the frame and sash, the top of the frame being shown flat. Fig. 9 is a detail fragmentary section of the joint of the side member and top of the frame. Fig. 10 is an enlarged vertical section of the lower portion of the frame and sash. Fig. 11 is a detail section of the joint between the sashes.

1 designates the window frame, 2 the upper sash and 3 the lower sash. All of these parts are constructed of sheet metal, the principle of the construction being the same in each case, that is to say, each part or member of the frame or sash is formed of sheet

metal bent to proper shape and interlocked tightly with adjoining parts of the same member by seaming the edges of the metal together without the use of soldering or rivets, the seaming being, in general, effected in such manner as to give flush joints.

The frame 1 comprises top member 4, side members 5 and sills 6. The top 4 is composed of a sheet metal top plate 7 having its edges bent in along the forward and rear edges as shown at 12, and of a channel shaped lower plate 9 having its forward and rear edges bent out to enter and be seamed or locked within the bent-over portions of the top member, the lower part of this lower plate having, where it takes the upper sash, an inset or groove 10 formed by bending the same. At its ends the top plate extending over the side members is bent down as shown at 11 (Fig. 1) to extend outside of the side member.

Each side member 5 consists of an inner plate or strip of metal 52 bent to form the stops 13 between which extend the two vertical grooves or guides for the sashes, and an outer sheet metal plate 14 having its ends seamed or interlocked as at 15 with the ends of the inner plate, and being bent to form a reentrant angle 16 forming a brick-stop, then extending inwardly at each side and being bent or doubled on itself to form a web or partition 17 of double thickness extending inwardly to abut against the inside wall of the inner member. This double partition 17 is clenched by driving or punching the sheet metal of one part through the other and clenching it as shown at 18.

The bottom member or sill 6 consists of a single plate of metal whose upper face is inclined and interiorly from the said inclined portion is bent upwardly to form a shoulder or stop 19, the said sill member being bent inwardly at the forward and rear edges to retain a filling 20, for example, of cement, which is molded thereinto. The bottom of the side members are also bent in as shown at 21 to engage under such cement filling.

The side members are secured to the top member and the sill by bending and folding together the edges at the front and rear thereof so as to form an interlocked seam-joint, the walls of the side members being thus seamed to the sides of the channel shaped bottom plate of the top member, as shown in Fig. 9. The joint at the bottom



of the frame at the front and rear is identical with that shown in Fig. 9, and the inside wall of each side member is secured to the top of the sill member by seam-jointing to form the angle joint, as shown at 55 in Fig. 1. The bottom plate of the top member extends, as shown at 56, over the top of the inside wall of each side member so as to rest thereon, this extended portion serving as a means for supporting the hanger or bracket 61 for the supporting wheel 60 for the sash weight 58. This extended portion is secured to the side member by a brace 57 which may be riveted to the two members which it connects, but said rivets form no essential part of the structure and they are not in position to interfere with the efficiency of the frame construction in cutting off transmission of heat between the front and rear of the frame. The construction of the window frame in this manner is facilitated by the formation of the top member of the frame in two parts, the upper part 7 being left off until the channel shaped lower part 9 is connected to the side members, as above described, and the upper part 7 being thereafter seamed to the lower part 9 of the top member.

Each sash 2 or 3 comprises top, bottom and side members, each formed of sheet metal bent to form a hollow member, the ends of said members being interlocked or seamed together to form rectangular frames. The top bar or member of the upper sash is formed with a top plate 23 bent down at each edge to engage and be seamed within the bent-over edge portions of the lower plate 24 formed of sheet metal bent in trough shape with a reëntrant rectangular stop, shoulder or rabbet 25 and with a groove 30, near the edge of the plate, to receive the glass stop. The side members of the top sash are formed of sheet metal, the outer plate 26 having its edges bent over and seamed within the bent-over ends of the inner plate 27, which is also of sheet metal and is trough shaped and formed with a rabbet or shoulder 25. The side walls of this inner plate are extended outwardly beyond the outer plate and then bent inwardly forming fins or flanges 29 of double thickness, the space between said flanges serving to receive the stop for guiding the sash as hereinafter described. The inner face or shoulder of the inner plate 27 has adjacent to the side wall a groove or depression 30 formed by bending the metal to engage and lock the glass fastener or stop as hereinafter set forth. The bottom bar is constructed of an upper member 31 (Fig. 2) having a rabbet or shoulder 25 and a groove 30, similar to the corresponding parts of the top bar or member above described, the inside wall of the said upper member being extended laterally and then upwardly to engage and be seamed or interlocked with the

lower member 34 forming a lateral flange 35 with an upwardly extended rib or flange 32. The said lower member is interlocked at its other edge with the other wall of the upper member.

The several sash members or bars above described are interlocked or seamed together as indicated at 33 in Fig. 5, the joint being diagonal or mitered, as shown in Fig. 1. This forms a rectangular frame having a continuous rectangular rabbet or shoulder 25 to receive and support the glass indicated at 37. To hold the glass in place, glass stops 38 are provided, each consisting of sheet metal bent to form a trough of triangular section bent and extended at one edge to form a fin 39 to engage or snap in the groove 30 aforesaid in the sash frame so that after the glass is put in place these glass stops can be snapped into place over the same and hold the glass firmly in position. Said glass stops are mitered at their ends and interlocked as shown at 53 at such mitered portions so that they mutually support one another at the joints.

It will be noted that in the above window frame the stops 13 which guide the sashes are fixed parts of the frame. In order to enable insertion of the sashes a removable extension strip 40 is provided at each side of each sash, said strip being of a double channel strip or H-strip of sheet metal, each edge of said web being bent on itself to one side and then to the other side of said web to form double flanges, the flanges 41 on one side of the web being adapted to engage within the flanges 29 on the sash and the flanges 42 on the other side of said web projecting from the channel between flanges 29 and being adapted to run within the stops 13 on the side members of the frame 1. Said strip 40 is secured in position on the sash by means of a spring catch 43 engaging in detent means 44 (Fig. 1) on the sash and released by manual operating means 45. As the lower end of the channel between flanges 29 on the sash is open, the strip can be pushed up from the lower end until the catch 45 passes said detent means, whereupon the said strip is retained between said detent means and the top plate of the sash, which plate extends over this channel to form a fixed projecting means at the top of the channel for holding the strip from upward movement in the channel. The said strip is thus a floating strip, being unattached to the sash but confined thereon between the sash body, the flanges 29, the top plate of the sash, the catch 43 and the wall of the side member of frame 1. The strip 40 therefore moves up and down with the sash, and by engaging between the stops 13 on the frame 1, it holds the sash from coming out. When it is desired to remove the strip, to take out the sash, the sash is raised, a finger inserted up through the open bottom of the



channel between flanges 29 and by pressing on finger piece 45, the catch 43 is disengaged from detent means 44, and the strip 40 allowed to drop and is then taken out.

5 The construction of the lower sash is similar to that above described with the parts inverted and the bottom face of the lower bar inclined to fit the sill, and with its top bar having a lateral extension 35 and a vertical  
10 rib or flange 36 formed by extending and interlocking its upper and lower members.

The lateral extension 35 of the upper sash extends sufficiently far toward the lower sash to project beneath the reversely extending lateral flange 35 on the top member  
15 of the lower sash, so that when the sashes are in closed position these lateral extensions will abut and close the space between the sashes. The seamed portions or flanges 32,  
20 36 on the respective lateral extensions extend reversely in a vertical direction or parallel to the sash to abut and fit on one another, giving a tight joint.

The sash may be suspended by chains 47 passing through the top plate of the sash and engaging or extending under said top plate, in Fig. 1, and the sash is locked by means 48. The partition 17 divides the space within the side members into ways for the respective  
30 weights. To facilitate insertion of the weights in their ways, openings are formed in the inner plates 52 of the side members, with a removable closure 49, held by a bend 50 in its lower end engaging the edge of the  
35 metal at the bottom of the opening and by screws 51 at the upper end.

By the above described construction, the window frame and the sash frames are each formed as a unitary structure, all joints being seamed joints, and there being no rivets or brazed joints. It has been found that in case of fire a rivet joint is objectionable in that the rivet carries the heat more readily than the sheet metal structure, both by reason of the continuous conductive path afforded by the rivet, and by reason of the imperfect closure of the rivet hole by the rivet, and this reduces the fire protection afforded by the window. With a seamed joint the  
50 overlapping and folded parts present a succession of alternate air spaces and metallic walls constituting barriers to the heat. The folding of the edges in an interlocked seam also forms a continuous reinforcement at the joint, which braces and strengthens the window frame at that part, this reinforcement being of uniform thickness, greater than the thickness of the sheet metal.

What I claim is:—

60 1. A window construction consisting of a frame having top, bottom and side members, each side member being of sheet metal bent and seamed to form a tubular structure, and the top member being formed of sheet metal  
65 bent and seamed to form a tubular struc-

ture and having its edges at each end, at the front and rear faces of the frame, bent and folded on the adjoining edges of the side member to form a seam joint of uniform thickness greater than the thickness of the  
70 sheet metal.

2. A window construction consisting of a frame having top, bottom and side members, each side member being of sheet metal bent and seamed to form a tubular construction  
75 and the top member being formed of lower and upper sheet metal parts seamed together, the lower part of the top member having its edges at each end, at the front and rear faces of the frame, bent and folded on  
80 the adjoining edges of the adjacent side member to form a seam joint providing a plurality of thicknesses of metal at the joint.

3. A window frame construction comprising three adjacent members, two of  
85 which are each formed of sheet metal bent and seamed to form a tubular structure, and the other member comprising a sheet metal portion bent in channel shape and having its edges at each end at the front and rear  
90 faces of the frame bent and folded on the edges of the said other two members to form a seam joint of uniform thickness greater than the thickness of the sheet metal.

4. A window sash construction consisting  
95 of a plurality of members each member formed of two plates of sheet metal seam-jointed by bending and folding on each other to form a tubular structure, and the edges of each member being bent and folded on  
100 the edges of the adjacent members to form a continuous seam joint of uniform thickness, greater than the thickness of the sheet metal.

5. A side member for window frames,  
105 consisting of sheet metal bent to form a tubular structure, with a portion of the metal bent inwardly and doubled on itself to form a partition extending to the opposite wall of the structure, the doubled parts  
110 of said partition being clenched on each other.

6. A window frame comprising side members each consisting of an inner plate bent to form sash stops and an outer plate  
115 seamed and inter-locking at its edges with the inner plate, and having a portion bent toward and extending to the inner plate to form a partition, said partition having its parts clenched on one another, in combination with a window frame sill consisting of sheet metal bent upwardly to form a bottom  
120 sash stop and having its lower edges bent inwardly, and cement filling within said sill.

7. A window frame construction comprising side members of sheet metal formed in tubular shape, and a top member consisting of a sheet metal top plate and a channel shaped bottom plate, seamed to the top plate, the sides of the bottom plate of  
130



the top member having its edges bent and folded on the edges of the walls of the side members, and the top plate of the top member extending over the side members and bent to extend down outside the side members.

8. The combination with a sash frame having flanges forming a channel closed at top and open at bottom, of a removable strip extending between said flanges, a spring catch on said strip, and a fixed detent on the sash extending beneath said catch.

9. In a window construction, two sashes, the frame of each being formed of sheet metal members bent in tubular shape and joined at their ends by seam-jointing, each sash having the member at one end formed with a lateral sheet metal flange bent over and folded on itself to form a rib, said ribs extending reversely in the two sashes to fit on one another when the sashes are closed.

10. A window frame comprising side members, each consisting of inner and outer sheet metal plates, formed in channel shape and seam jointed together to form a tubular structure, a sill member formed in channel shape and seam jointed at its ends to the side members, and a top member comprising

a channel shaped lower plate seam jointed at its ends to the side members, and a top plate seam jointed to the lower plate.

11. A window frame comprising side members, each consisting of inner and outer sheet metal plates formed in channel shape and seam jointed together to form a tubular structure, a sill member formed in channel shape and seam jointed at its ends to the side members, a filling of cement in the channel of the sill member, and a top member comprising a channel shaped lower plate seam jointed at its ends to the side members, and a top plate seam jointed to the lower plate.

12. A window frame comprising two side members, each formed of sheet metal bent in tubular shape, and a member connecting said side members and formed of sheet metal bent in channel shape and seam jointed to the side members, at its front and rear, and at the angle joint between the members.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 28th day of March 1907.

JOSEPH C. SPECHT.

In presence of—

ARTHUR P. KNIGHT,  
FRANK L. A. GRAHAM.