

No. 871,228.

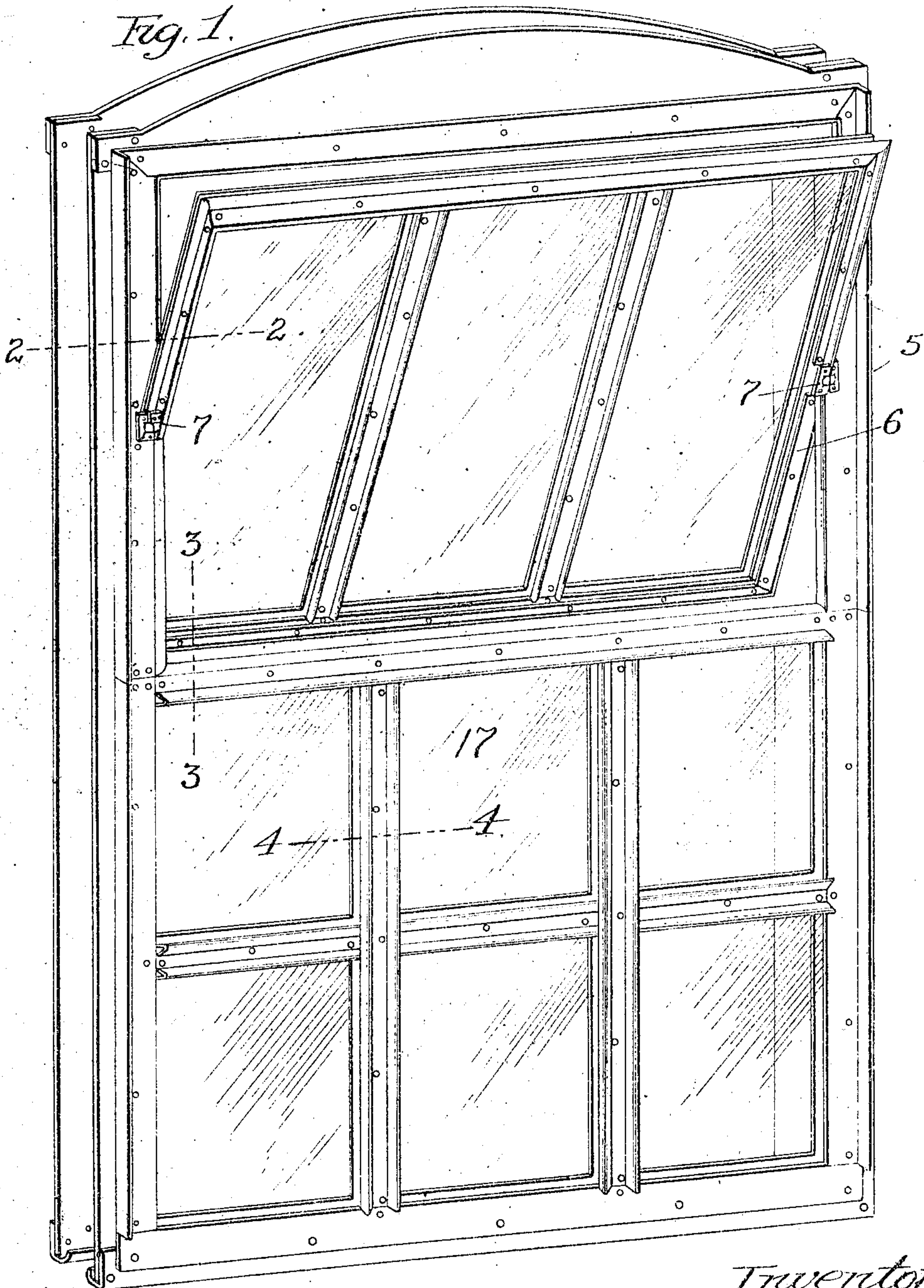
PATENTED NOV. 19, 1907.

E. H. LUNKEN & C. M. CONKLIN.  
METALLIC WINDOW CONSTRUCTION.

APPLICATION FILED JAN. 25, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



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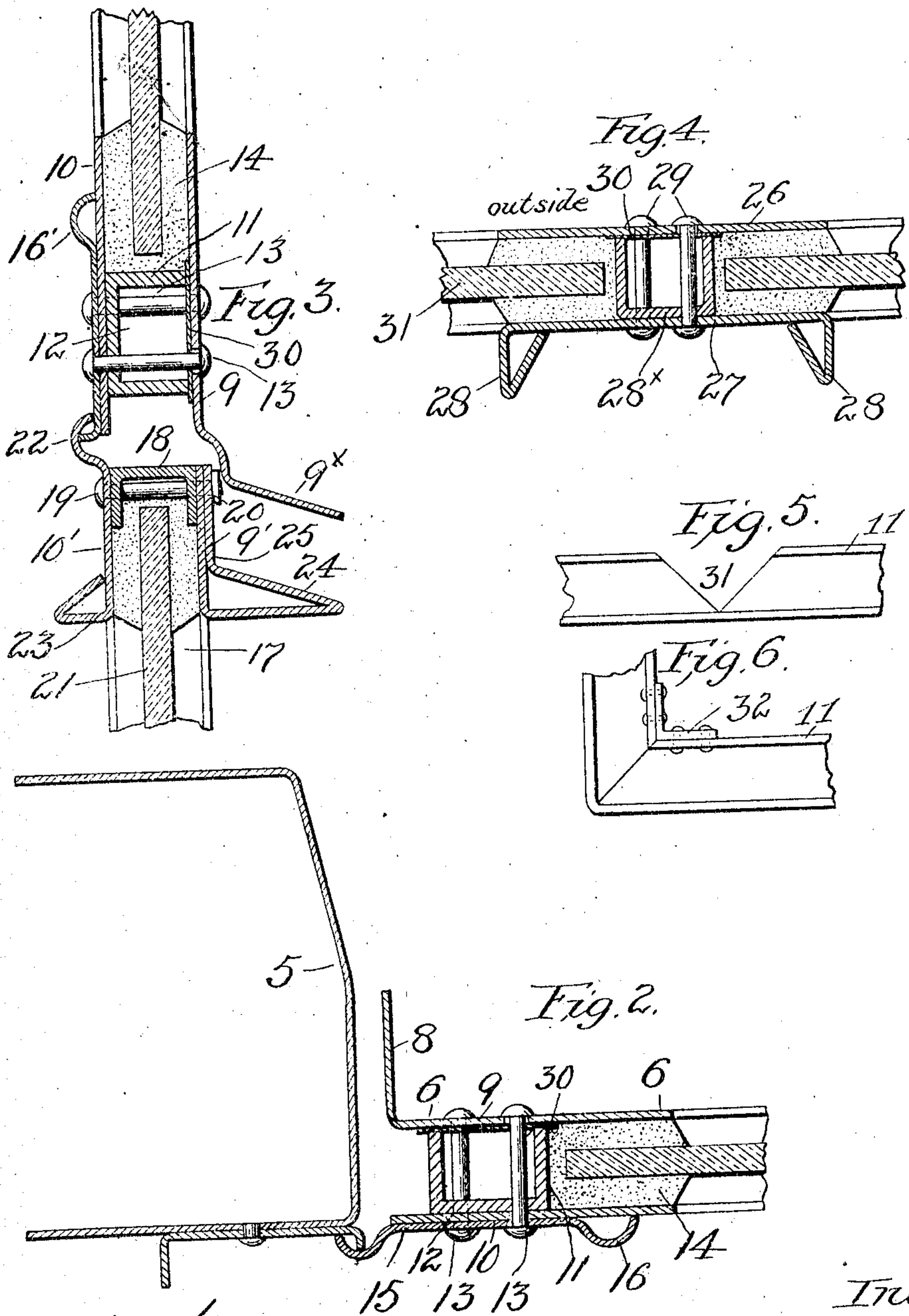
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# UNITED STATES PATENT OFFICE.

EDMUND H. LUNKEN AND CHARLES M. CONKLIN, OF CINCINNATI, OHIO, ASSIGNORS, BY  
DIRECT AND MESNE ASSIGNMENTS, TO THE LUNKEN STEEL WINDOW CO., A CORPO-  
RATION OF OHIO.

## METALLIC WINDOW CONSTRUCTION.

No. 871,228.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed January 25, 1907. Serial No. 354,030.

*To all whom it may concern:*

Be it known that we, EDMUND H. LUNKEN and CHARLES M. CONKLIN, citizens of the United States, residing at Cincinnati, Ohio, have invented certain new and useful Improvements in Metallic Window Construction, of which the following is a specification.

Our invention is an improvement in metallic and mineral composition windows of the general class disclosed in an application for Letters Patent of the United States filed by us October 30, 1906.

Our present improvements relate, in the main, to spacing means between the inner and outer members, of which the glass carrying frame is composed; to means for reinforcing the glass holding means at the point of juncture between the said holding means and the glass; to an arrangement of muntin and frame members whereby protection from the action of heat is afforded and the parts are strengthened to resist distortion; and to features of construction and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of a window embodying our invention. Fig. 2 is a detail sectional view on the line 2—2 of Fig. 1, with the swinging frame closed. Fig. 3 is a sectional view on the line 3—3 of Fig. 1, and Fig. 4 is a detail sectional view on the line 4—4 of Fig. 1. Figs. 5 and 6 are detail views of the spacing members.

Referring to Figs. 1 and 2, the main frame of the window is shown at 5 and the glass carrying frame at 6. This glass carrying frame is pivoted to the main frame at 7 in a manner similar to that disclosed in the application referred to. The swinging frame, like that shown and described in said application, is composed mainly of three parts, the outer pressed steel or mineral composition member having a flange 8 and the rim 9, the inner member composed of flat bars 10 forming a rectangular frame and between these inner and outer members is the spacing and glass holding means. In our present construction this spacing means comprises the channel member 11 formed of fire proof material, said member fitting between the inner

and outer members where it is held by the rivets or bolts 13 arranged near opposite edges of the said member and in staggered relation. This channel member is substantially U shape in cross sections, having its open or channel side directed towards the outside of the window with its edges resting upon the lining 30 of asbestos or other non-conducting material. The limbs of the U shaped member provide transversely extending parts at different distances from the edges of said frame members. A dead air space is provided by this construction at 12. The important features and advantages of this construction and arrangement of the spacing member will be referred to more at length hereinafter in connection with the description of the muntins at which a similar spacing member is employed and in substantially the same relation.

We have extended the stop strip 15 of the swinging frame to make it reach over that portion of the inside member 10 of the swinging frame which furnishes the means for holding the putty and glass, and this overlying part of the stop strip extension is pressed or rolled into a bead or channeled portion 16. It thus provides a strong reinforcement or backing for the edge of the glass and will sustain the edge of the glass against lateral pressure and thus resist the force of a stream of water turned upon it from a hose to a sufficient degree to meet the fire-underwriters requirements. This rolled or pressed edge of the stop or reinforcing strip will present an ornamental appearance at the interior face of the swinging frame.

Referring to Fig. 3, we illustrate here the upper portion of the lower stationary panel or frame 17 and the lower portion of the upper swinging frame 6. It will be observed that the stop strip on the lower portion of the swinging frame is provided like that above described with a reinforcing or channeled portion 16' to sustain the inner plate or member 10 of the swinging frame against force applied to the outside of the window, and particularly to force applied to the glass. The stationary panel 17 is composed of the inner and outer frame members 10' and 9' with the removable bar 18 secured between the upper edges thereof by means of the bolt 19 and nut 20; this part being removable so that the



glass shown at 21 may be removed and replaced. The inner member or plate 10' is continued to form the stop strip at 22 and it is bent at 23 to provide a hollow bead or rim  
 5 surrounding the opening of the glass carrying frame. The outer member or plate 9' is likewise continued and bent back upon itself so as to provide a rim 24 extending outwardly some distance, the said rim being triangular  
 10 in cross section and being hollow and having its flange 25 fitting against the outer face of the outer rim member 9' where it is secured by bolts 19. These hollow rims 23—24 provide dead air spaces which like the dead air  
 15 space 12 prevent conduction of heat. The hollow rim 24 presents an inclined upper side to shed the water and direct it outwardly from the window and the swinging frame at its lower edge is provided with a continuation  
 20 of the outer plate or member 9, as shown at 9<sup>x</sup>, which inclining downwardly also serves to direct the water from the window.

Referring now to Fig. 4, which shows the construction of the muntins, it will be seen  
 25 that we employ an outside member 26 consisting of a flat bar or sheet of metal and an inner member consisting of a sheet or bar of metal 27, the edges of which are bent to form the hollow angular beads or rims 28;  
 30 which serve to stiffen the muntin on the inner side and provide dead air spaces at these points. The inner and outer plates or members 26—27 are spaced apart and are connected by the channel members 28<sup>x</sup> and the staggered bolts or rivets 29. The channel member  
 35 28<sup>x</sup> is of U shape in cross section and its edges rest upon the lining 30 of non-conducting material, such as asbestos. This spacing member 28<sup>x</sup> provides a dead air space and  
 40 the asbestos lining prevents the conduction of heat to this space; and also prevents the conduction of heat between the members 26 and 27. The glass is shown at 31 extending with its edges between the members 26 and  
 45 27. The rivets or bolts 29 pass through openings in the member 26 of slightly larger diameter than the rivets. This will allow the plate or member 26 to expand in all directions without affecting the connecting rivets.  
 50 The plate or member 26 serves as a protection to the parts of the muntin on the inner side thereof and this plate under the action of heat will buckle or become distorted only to a minimum extent, because of the fact that it  
 55 is formed plain throughout and is free from ribs or projections. The stiffer a metal plate is when cold the greater its tendency is to buckle under the action of heat, and therefore this plate 26 is made plain so that while affording an efficient means of holding in the  
 60 glass, it will not buckle to such an extent as to disrupt the joints and expose the inner parts. The protection afforded by this plate will enable the inner parts to remain comparatively cool, and they being stiffened by

the channel form and the beads or rims will maintain the structure in its original shape.

It will be noticed that the channel of the member 28<sup>x</sup> is directed outwardly. This is of special importance as the amount of surface in contact with the outer portion of the muntin is thereby limited to merely the width of the edges of the U-shaped member and by reason of this and the dead air space formed by the outwardly facing channel  
 75 member the main portion or bottom of the channel will be kept cool and will not be liable to distortion from heat and in this respect the arrangement shown is of special advantage over an arrangement in which the channel member at its main portion or bottom is directed outwardly and its channel facing inwardly.  
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As above stated, the spacing member 11 of the swinging frame presents the same advantages at said frame as do the spacing members of the muntins, that is provides a dead air space; it has a limited bearing at its edges against the outer frame member; it bears on the asbestos, and its general arrangement  
 85 is to prevent the conduction of heat and the distortion of itself or the frame member. In Fig. 5 we show a part of one of these spacing members looking at the channel side thereof. It is cut away at 31 to provide an angular  
 90 notch, after which it is bent as shown in Fig. 6, to form the spacing frame which, as a whole, is U-shape. It is strengthened at its corners by the angle pieces 32 riveted in place.  
 100

In one aspect our spacing member of channel form provides by its flanges, in effect, a pair of spacing members arranged at a distance apart with a dead air space in between.

Where in the appended claims we employ  
 105 the term "face" we refer to either the inner or the outer face of the glass carrying sash or frame.

What we claim as our invention is:—

1. In combination in a fire-proof window, inner and outer frame members, spacing means comprising the transversely extending parts arranged at different distances from the edges of said frame members and between the same, and the glass held between the frame members, substantially as described.  
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2. In combination in a fire-proof window, a frame made up of inner and outer frame members in rigid relation to each other, spacing members comprising transversely extending parts arranged therebetween, and at a distance apart with a dead air space between the said spacing parts, and the glass carried by the frame, substantially as described.  
 120

3. In combination in fire-proof windows, the inner and outer frame members, adapted to carry the glass therebetween, and spacing means between the said members comprising a channeled bar at or near each edge of the frame to which the inner and outer frame  
 125 130



Members are secured, the interior of said channel members being free, substantially as described.

4. In combination, in a fire-proof window, the inner and outer members of the frame, spacing members therebetween comprising a U shaped frame composed of a channeled member and the glass carried by the frame, substantially as described.

5. In combination in fire-proof windows, the inner and outer frame members, the glass held thereby and arranged with its edge therebetween, and a reinforcing or backing member overlying the frame member adjacent the edge of the glass, substantially as described.

6. In combination in fire-proof windows, a glass holding frame, a stop strip, said stop strip being extended over the frame to a point opposite the edge of the glass to form a reinforcing or backing member at this point, substantially as described.

7. A fire-proof window comprising a glass holding frame having a channeled or beaded portion adjacent the edge of the glass to sustain the same against lateral pressure, substantially as described.

8. In combination in fire-proof windows, the inner and outer members with the glass arranged with its edges therebetween and a channeled or beaded reinforcing member extending over the frame member adjacent the edge of the glass to sustain the same against lateral pressure, substantially as described.

9. In combination in fire proof windows, a frame carrying the glass, a stop strip having its inner edge channeled or turned to form a strengthening portion overlying the frame adjacent the edge of the glass, substantially as described.

10. In combination in fire proof window constructions, the inner and outer frame members having the glass therebetween, said outer member having a bead or rim at its upper portion with an inclined upper side to direct the water outwardly, substantially as described.

11. A fire proof window frame carrying the glass and having a hollow bead or rim extending along one face of the same to form a dead air space, substantially as described.

12. In a fire proof window construction, a frame having a muntin comprising the inner and outer members, a channeled spacing member therebetween, and means for holding the said members together, substantially as described.

13. In combination in fire proof windows

constructions, a muntin composed of the inner and outer members, the said inner member having stiffening beads or rims and the outer member being plain, and means for holding the said members together, substantially as described.

14. In fire proof window constructions, a muntin or frame comprised of inner and outer members, a spacing member therebetween, and an asbestos lining between the spacing member and the outer member, substantially as described.

15. In fire proof window constructions, a muntin or frame comprising inner and outer members, a spacing member therebetween, and rivets for holding the members together passing through openings in the outer member of larger diameter than the rivets, substantially as described.

16. In fire proof window constructions, a muntin or frame composed of inner and outer members with a channeled member between them and the asbestos or non-conducting lining between the edges of the channel member and the outer member, substantially as described.

17. In a fire proof window construction, a frame or muntin comprising the inner and outer members, a channeled spacing member therebetween and bearing thereagainst, having its channel or open side directed outwardly, and means for holding the said members together, substantially as described.

18. In combination in a fire-proof window, inner and outer frame members, spacing means comprising the transversely extending parts arranged at different distances from the edges of said frame members and between the same, and the glass held between the frame members, and between the spacing means arranged at one point and the spacing means arranged at another point, substantially as described.

19. In a fire-proof window construction, a frame or muntin comprising the inner and outer members, a channeled spacing member therebetween and having its open side directed against one of the said members with the edges of the portions forming the channel bearing against the said member, substantially as described.

In testimony whereof, we affix our signatures in presence of two witnesses.

EDMUND H. LUNKEN.

CHARLES M. CONKLIN.

Witnesses:

ALBERT F. KLAYER,

EDWIN E. KAISER.