No. 816,241. PATENTED MAR. 27, 1906.

W. H. MILLER.

WINDOW CONSTRUCTION.

APPLICATION FILED SEPT. 20, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

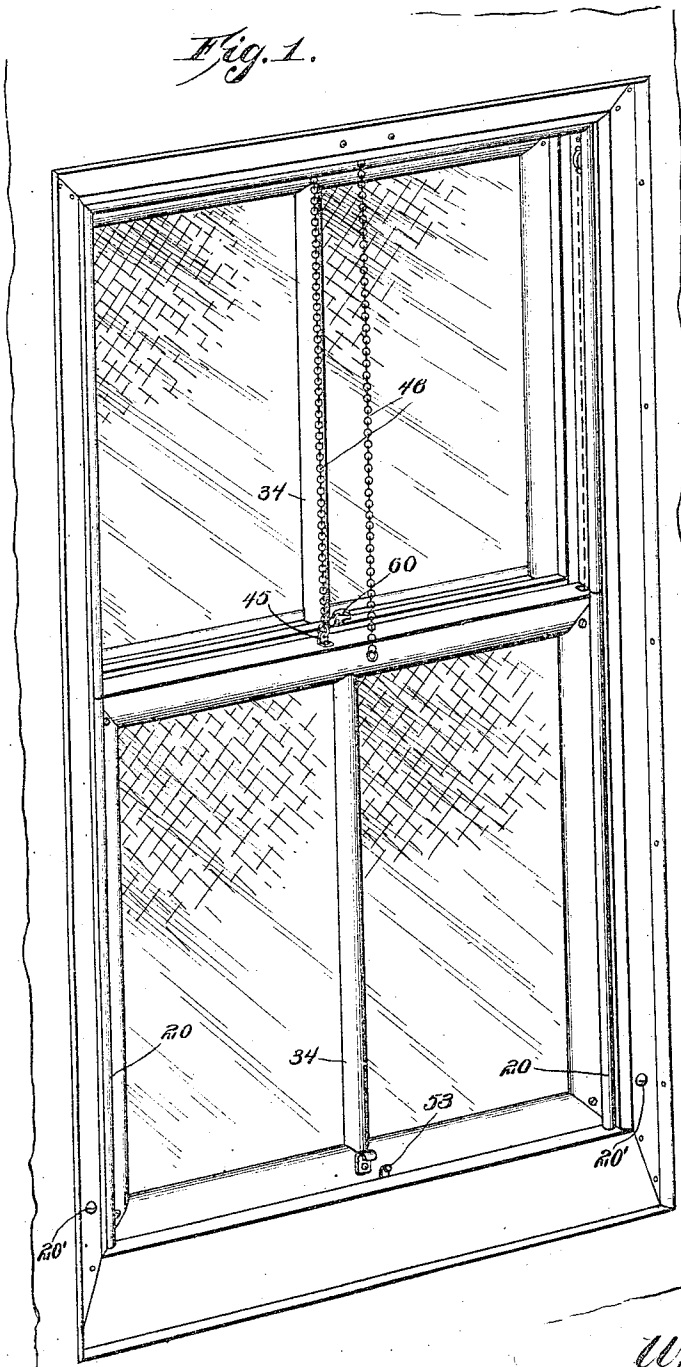
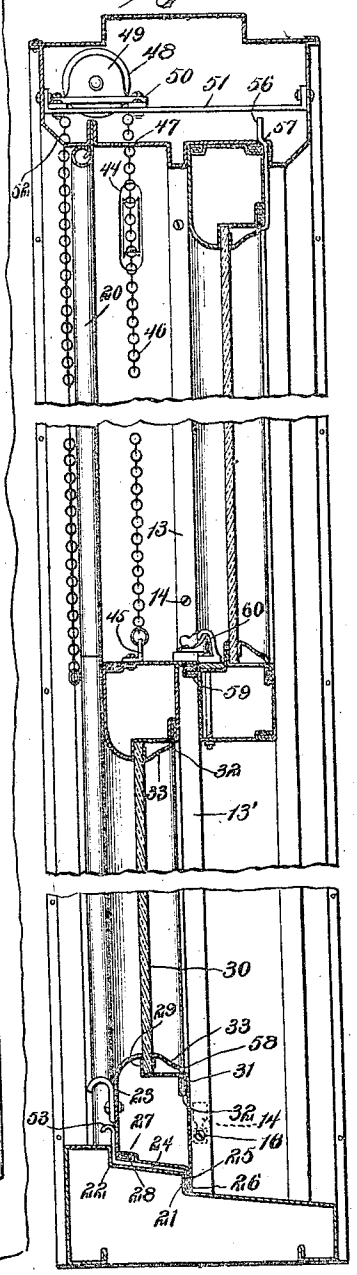


Fig. 2.



Witnesses

Louis R. Hinrichs

Herbert D. Lawson.

Inventor

William H. Miller

By W. J. FitzGerald & Co

Attorneys

No. 816,241. PATENTED MAR. 27, 1906.

W. H. MILLER.

WINDOW CONSTRUCTION.

APPLICATION FILED SEPT. 20, 1905.

3 SHEETS—SHEET 2.

Fig. 3.

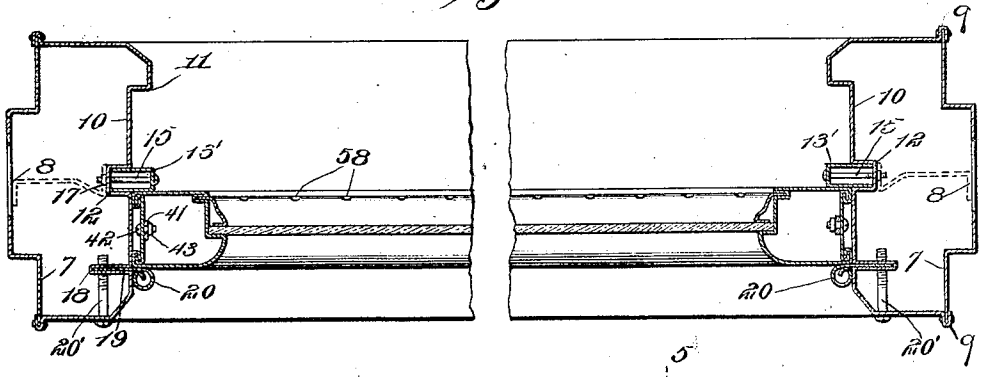


Fig. 4.

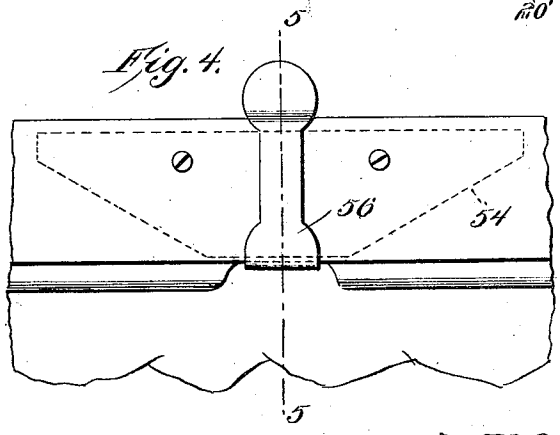


Fig. 5.

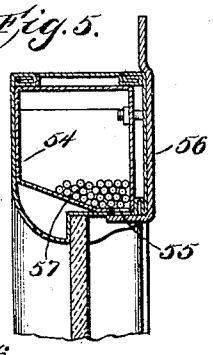


Fig. 6.

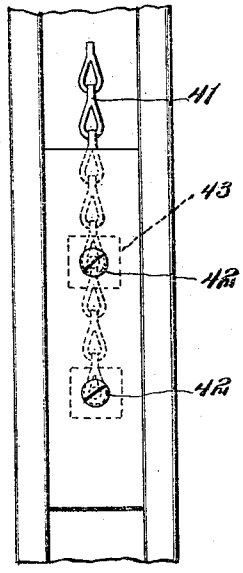
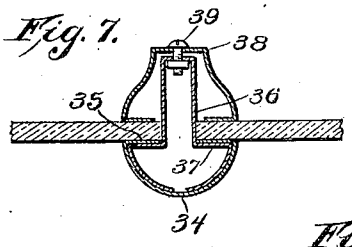


Fig. 7.



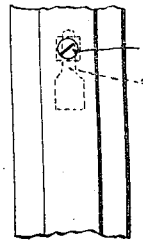
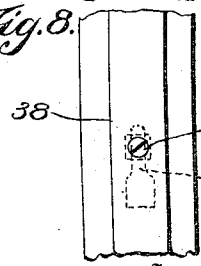


Fig. 8.



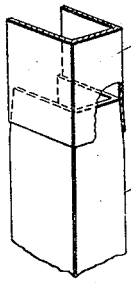


Fig. 8a.

Witnesses

Louis R. Heinrichs

Herbert D. Lawson.

Inventor

William H. Miller

By W. J. Fitz Gerald & Co

Attorneys

No. 816,241. PATENTED MAR. 27, 1906.

W. H. MILLER.

WINDOW CONSTRUCTION.

APPLICATION FILED SEPT. 20, 1905.

3 SHEETS—SHEET 3.

Fig. 9.

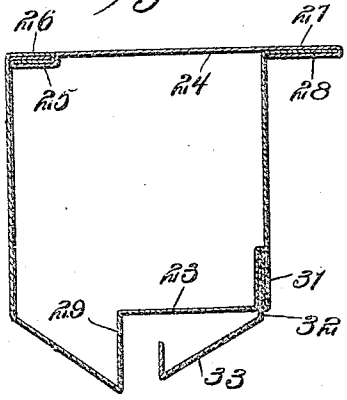


Fig. 11.

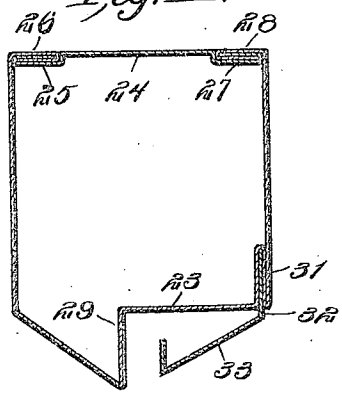


Fig. 10.

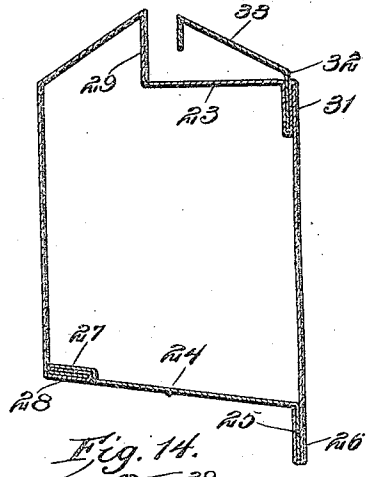


Fig. 12.

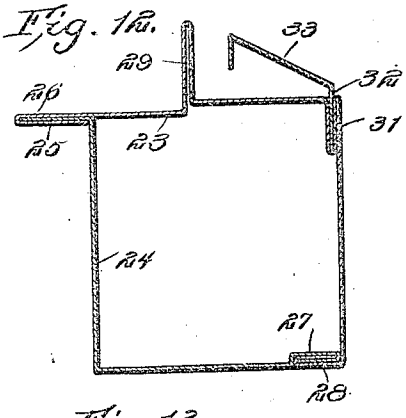


Fig. 13.

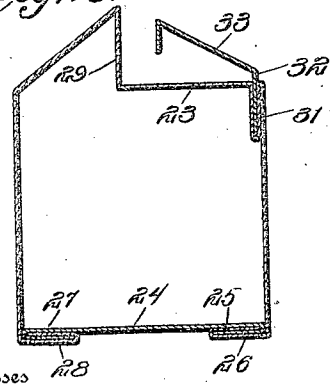
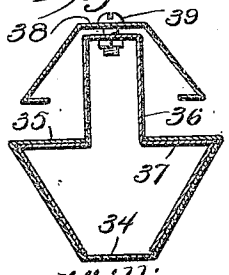


Fig. 14.



Witnesses

Louis R. Heinrichs

Herbert D. Lawson.

Inventor

William H. Miller

By W. J. FitzGerald & Co

Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM HENRY MILLER, OF GALVESTON, TEXAS.

WINDOW CONSTRUCTION.

No. 816,241. Specification of Letters Patent. Patented March 27, 1906.

Application filed September 20, 1905. Serial No. 279,317.

To all whom it may concern:

Be it known that I, WILLIAM HENRY MILLER, a citizen of the United States, residing at Galveston, in the county of Galveston and State of Texas, have invented certain new and useful Improvements in Window Construction; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in window construction.

The object of the invention is to provide a fireproof structure of this character which is of simple and durable construction, formed of but few parts and which has sashes, also fireproof, which can be readily removed for the purpose of repairing or replacing them.

A still further object is to employ means whereby glass can be secured within the sashes without the use of putty, said means being removable should it be desired to replace the glass held thereby.

A further object is to provide metallic sashes having balances of the ordinary construction, said sashes being so mounted as to automatically close should they be subjected to an unusually high temperature.

With the above and other objects in view the invention consists of a window-frame the sides, top, and bottom of which are each formed of sheet metal peculiarly shaped so that the parting-strips and the bead-strips can be readily connected thereto for the purpose of retaining the sashes in proper position. These sashes have their side, top, and bottom rails, as well as their mullion-bars, formed of sheet-metal strips which interlock, and glass-retaining caps are removably mounted within the rails and bars, and by their use putty and the ordinary means for retaining glass are dispensed with. Each sash has weights connected to it and suspended within the frame, and the weights of the lower sash are slightly lighter than said sash, so that the sash will remain normally closed. Means are provided, however, for supporting the sash in open position; but said means is formed of fusible material, whereby when unusual heat is applied to the sash it will be released and drop to closed position. The upper sash is about balanced by its weights and normally contains a weight which is adapted to be released when said sash is subjected to unusual heat, so that the sash will be overbalanced and raised to a closed position.

The invention also consists of certain other novel features of construction and combination of parts, which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings I have shown the preferred form of my invention.

In said drawings, Figure 1 is a perspective view of my improved fireproof window. Fig. 2 is a vertical section therethrough. Fig. 3 is a horizontal section through the lower sash and the adjoining portion of the frame. Fig. 4 is an enlarged elevation of the central portion of the upper rail of the upper sash. Fig. 5 is a section on line 5 5, Fig. 4. Fig. 6 is an enlarged side elevation of a portion of a sash, showing the manner of securing the balances thereto. Fig. 7 is an enlarged section through a mullion-bar, and Fig. 8 is an elevation of a portion of the mullion-bar. Fig. 8^a is a detail view of the adjoining end of the parting-strip. Figs. 9 and 10 are sections through modified forms of top and bottom rails of the bottom sash. Figs. 11 and 12 are similar views through modified forms of top and bottom rails of the top sash. Fig. 13 is a section through a modified form of side rail for both sashes, and Fig. 14 is a section through a modified form of mullion-bar.

Referring to the figures by numerals of reference, 7 represents the outer face-plates of the sides of the window-frame, and these plates have apertures 8, through which access may be had to the interior of the frame. The edges of each plate 7 project into channeled flanges or beads 9, formed at the edges of the inner face-plate 10, and are preferably permanently connected by rivets. This face-plate is so shaped as to form a longitudinally-extending shoulder 11, which constitutes the outer retaining-bead of the frame and has a channel 12 extending longitudinally therein at a distance from the shoulder 11 equal to the thickness of the upper sash. This channel receives a parting-strip 13 13′, formed of channeled sheet metal, which is secured within channel 12. This parting-strip is formed of an upper and lower section 13 and 13′, respectively. The upper section 13 is fixedly secured in place by means of bolts 14, which extend through the strips 13 and the inner wall of the channel 12. The lower section 13′ of the parting-strip, however, is detachably held in place by means of a bolt 15, which extends through

the section 13′ and through a keyhole-slot 16, formed in the inner wall of channel 12. The inner end of this bolt is provided with a head or nut 17, which is adapted to engage the contracted portion of slot 16, but which is removable by pressing it into the upper or enlarged portion of the slot. Each section 13′ has its upper end slightly reduced, and this end fits into the lower end of the adjoining section 13, so that a limited longitudinal movement of section 13′ is permitted for the purpose of detaching said section from the casing. Another longitudinally-extending groove or channel 18 is formed in each face-plate 10 at a distance from channel 12 equal to the thickness of the lower sash, and this channel is adapted to receive a flange 19, formed upon a bead-strip 20, which preferably consists of a rolled strip of metal, which bears upon face-plate 10 and overlaps the sash a sufficient distance to prevent its displacement. Flange 19 fits snugly within its channel 18, but may be further secured in place by means of solder, which can be placed thereon at intervals where the flange enters the channel. This solder can, however, be easily broken from the inside of the window-frame, so as to enable the bead to be removed. Said bead is formed of two similar sections disposed one above the other, and it is only necessary to remove the lower section when it is desired to take either of the sashes from the frame.

It will be understood that both sides of the window-frame are constructed in exactly the same manner, and the head and sill of said frame are also similar in construction thereto, except that the sill is not provided with a bead 20 and the parting-strip 13 and the top or head of the frame does not have its parting-strip or bead formed in sections, as are the strips 13′. As shown particularly in Fig. 2, the upper face of the sill is stepped, so that shoulders 21 and 22 are formed for overlapping the lower portions of the lower sash.

The two sashes used in this window are of practically identical construction, and therefore for the most part the description of one applies to both. The lower sash has each of its side, top, and bottom rails formed in two pieces of sheet metal—to-wit, an inner strip 23 and an outer strip 24. Said outer strip has one edge bent at an angle to constitute a flange 25, which is adapted to project into a channel 26, formed at one edge of the inner strip 23. The other edge of the strip 24 is channeled, as shown at 27, so as to interlock with a channel 28, formed at the other edge of strip 23. This outer strip 24 extends throughout the thickness of the sash, whereas the inner strip 23 constitutes the inside and outside faces of the sash and is adapted to form a shoulder 29, against which a glass 30 is adapted to abut. Formed within this strip 23, adjacent the shoulder, is a channel 31, and detachably seated within this channel is a flange 32, formed along one edge of a retaining-cap 33, which is adapted to abut against the glass 30 and hold it against the shoulder 29. Flange 32 may be secured within its channel by "tacking" it with solder, and these retaining-caps 33 can be readily removed should it be desired to replace any of the glass held thereby. It will be understood that the entire sash, excepting the mullion-bar, is constructed in the manner herein described, and the various strips are riveted at the corners of the sash, so as to produce a rigid structure. The mullion-bar, as shown particularly in Figs. 7 and 8, is formed of three portions—to wit, a channeled strip 34, having inwardly-extending flanges 35, and a bead-strip 36, which extends through and beyond the flanges 35, and is held in place by extensions 37, which extend under the flanges 35 and bear upon the intermediate portion of strip 34. The retaining-cap located on the bead 36 is so shaped as to extend in opposite directions from said bead to hold two lights of glass in place. This cap is detachably connected to the bead 36 by means of bolts which fit in keyhole-slots 40, formed within the bead 36. Chains 41 extend into the side rails of the sash and are fastened thereto by means of bolts 42, which extend through the chains and have nuts 43 therein for binding the chains against the walls of the side rails. These chains are located the same as are the cords of the ordinary sash and pass over pulleys 44, which are located in the inner face-plates 10 of the sides of the window-frame. The weights (not shown) are connected to these chains, and the weights of the lower sash are slightly lighter than said sash, while the weights of the upper sash are equal in weight to the normal weight of said sash.

As the lower sash is heavier than its weights, it is obvious that unless the same is provided with some kind of support it will not remain in opened position. I have therefore mounted a bracket 45 upon the top rail of the lower sash at the center thereof, and to this bracket is secured one end of a chain 46, which extends up through an aperture 47 in the head of the window-frame, then over a pulley 48. This pulley is journaled between ears 49, mounted on strips 50, which are suitably supported, as by means of cross-strips 51, within the head of the window-frame. The chain after leaving the pulley 48 hangs down through an aperture 52 in the head of the window-frame and in front of the bead-strip 20. When the lower sash has been raised, this chain is adapted to be placed in engagement with a hook 53, which is secured to the sash and is formed of fusible metal. By releasing the chain from the hook the sash will lower of its own accord; but the weights will serve to retard its down-

ward movement sufficiently to prevent it from falling so rapidly as to injure it.

As the weights of the upper sash normally balance said sash, it is not necessary, of course, to utilize any other means for holding it in raised or lowered position. This upper sash is constructed exactly the same as is the lower sash, excepting a receptacle 54, which is formed within the top rail of the sash and has the bottom thereof inclined downward toward the center of said rail, where an opening 55 is formed. This opening is normally covered by a closure 56, which is formed of fusible metal and which is connected by fusible solder with the upper rail of the sash and extends a short distance thereabove. Receptacle 55 normally contains shot 57, which adds materially to the weight of the sash.

From the foregoing description it will be understood that should the lower sash be supported in raised position by the chain 46 engaging the fusible hook 53 the same would promptly close automatically should said hook be subjected to more than ordinary heat, because the hook will fuse at a predetermined temperature, and the chain will be released. Should the upper sash be lowered, any unusual heat will cause the closure 56 to fuse, and the opening 55 will therefore be uncovered, and the shot will be free to drop therethrough. The weight of the sash will therefore be diminished, and the balances will promptly raise said sash into closed position. By extending the closure 56 above the sash the same will be quickly acted upon by flames or heat coming from the inside of the window, and the metal will therefore be more quickly fused than if said projection were not employed. It is of course necessary to form an opening 57 in the head of the frame for the reception of this fusible closure 56, as shown in Fig. 2.

The retaining-caps 33 may be provided with apertures 58 near their lower edges to allow water which may accumulate between said caps and the glass to flow therefrom. It will be understood that the glass employed may be of any form; but I preferably utilize glass in which metal is embedded, as in the form of netting.

While the windows are preferably provided with the means herein described for automatically closing them in the event of a fire, it will be obvious that, if desired, said means can be dispensed with.

I attach considerable importance to the simplicity of construction of the window sashes and frame. All of the parts are rigidly assembled, so as to produce a durable structure, and there is absolutely nothing used in the construction of the window but what is fireproof. It will be noted that the meeting-rails of the sashes are formed with flanges 59, which overlap, so as to form a tight joint when the sashes are closed. Any suitable form of sash-lock 60 may be connected to these meeting-rails.

In Figs. 9 to 14 I have shown sections of modified forms of sash rails and bars, which may be much more cheaply constructed than those shown in the other figures. These modified forms are the same as those hereinbefore described, with the exception that all curves are eliminated from the faces thereof, so that the same can be much more cheaply constructed.

The bead-strips 20 may be held against accidental displacement by means of screws 20′, which extend into the sides of the window-frame and through the channels 18, where they engage flanges 19 therein. This construction is shown particularly in Fig. 3.

Any desired form of chain 46 may be employed, and I do not, therefore, limit myself to the particular form shown.

While I have shown the lower sections 13′ of the parting-strips secured at their lower ends by bolts fitted in keyhole-slots, it will be understood that these slots may be dispensed with, if preferred, and any other means of securing said lower ends may be utilized.

Should an accident happen to one of the balance-chains, it can be very easily reached by cutting an opening in the jamb at any desired point between the parting and bead strips.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A window-sash formed of sheet metal, each rail consisting of two interlocking strips of sheet metal, one of said strips having shoulders for glass to abut thereagainst and a channel adjacent and parallel with the shoulder, a retaining-cap detachably mounted within the channel of each rail and extending adjacent the shoulder, a mullion-bar interposed between the rails of the sash and comprising a channeled strip, a bead projecting into and engaging said strip, a double retaining-cap extending from opposite faces of the bead and adjacent the channeled strip, and means for detachably securing said cap to the bead.

2. A mullion-bar for metallic window-sashes comprising a channeled strip, a bead projecting into and engaging said strip, a double retaining-cap extending from opposite faces of the bead and adjacent the channeled strip, and means for detachably securing said cap to the bead.

3. The combination with a metallic sash; of a sheet-metal frame therefor comprising a sill, and a head and sides mounted on the sill, said sides being each formed of an outer and an inner face-plate interlocking and secured at their edges, the inner face-plate having a sash-retaining shoulder and parallel channels, a parting-strip formed of two sections

mounted within one of the channels, means for detachably securing one of said sections within the channel, and a sectional bead-strip mounted within the other channel and the sections of the said strip being removable.

4. A sash comprising top, bottom and side rails and a glass-retaining cap detachably mounted within each of said rails and formed of sheet metal, said cap having an aperture therein constituting a drain.

5. The combination with a frame, of a lower sash having a balance-weight permanently connected thereto, a longitudinally-movable flexible device connected to the sash and supported by the frame, and fusible means upon the sash adapted when the sash is raised to engage the flexible device to support the sash.

6. The combination with a window-frame, of an upper and lower sash mounted therein, weights permanently connected to the sashes, weighting means inclosed within the upper sash, thermally-operated means for automatically releasing said weighting means, a flexible device supported by the frame and secured to the lower sash, and fusible means upon said lower sash adapted to engage the flexible device and support the lower sash in raised position.

7. The combination with a sheet-metal sash having a receptacle therein provided with an outlet; of weighted devices mounted within the receptacle, and a fusible closure for the outlet extending into contact with the sash and projecting thereabove.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HENRY MILLER.

Witnesses:
C. V. HERVEY,
THEO. A. JAEGER.