

(No Model.)

5 Sheets—Sheet 1.

F. W. STEVENS.
WINDOW.

No. 566,483.

Patented Aug. 25, 1896.

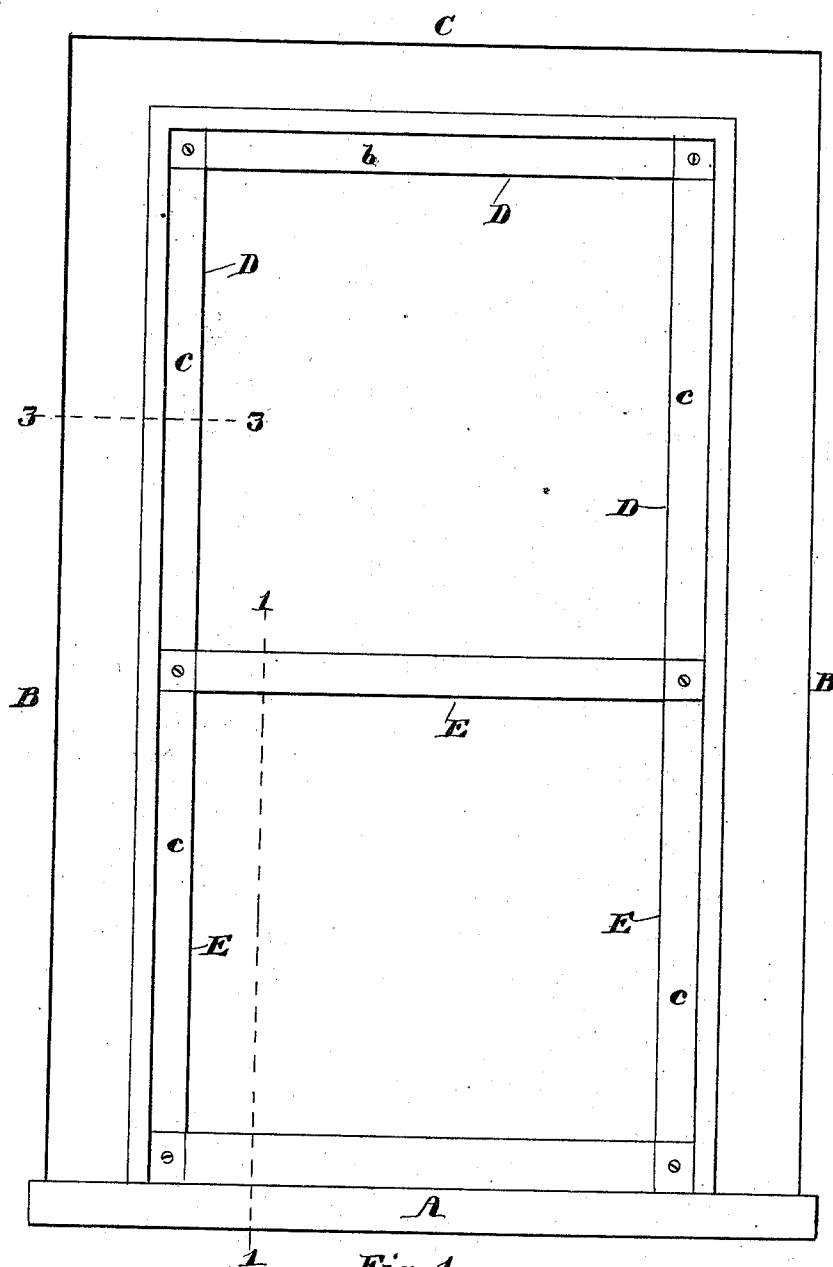


Fig. 1.

Witnesses:

Walter E. Lombard.
L. B. Greenleaf

Inventor:

Frank W. Stevens,
by N. C. Lombard
Att'y

(No Model.)

F. W. STEVENS.
WINDOW.

5 Sheets—Sheet 2.

No. 566,483.

Patented Aug. 25, 1896.

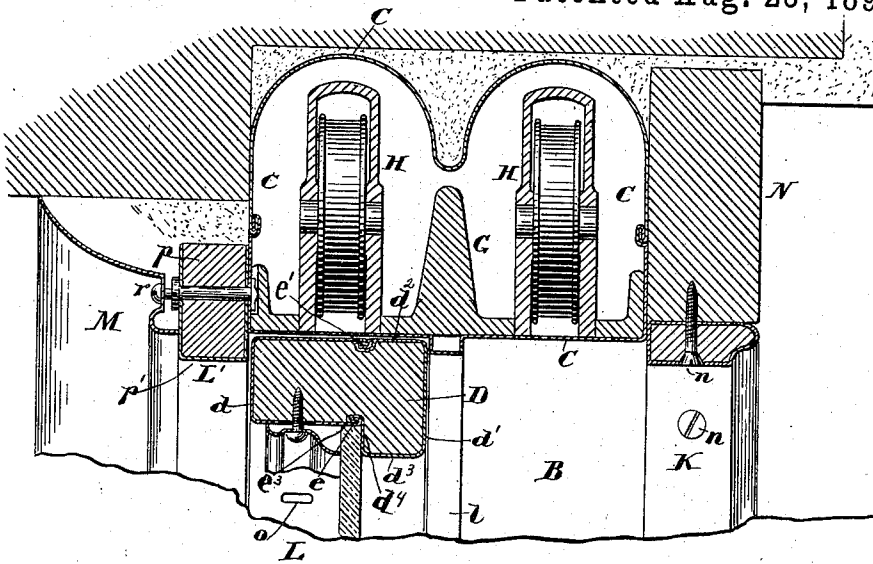


Fig. 3.

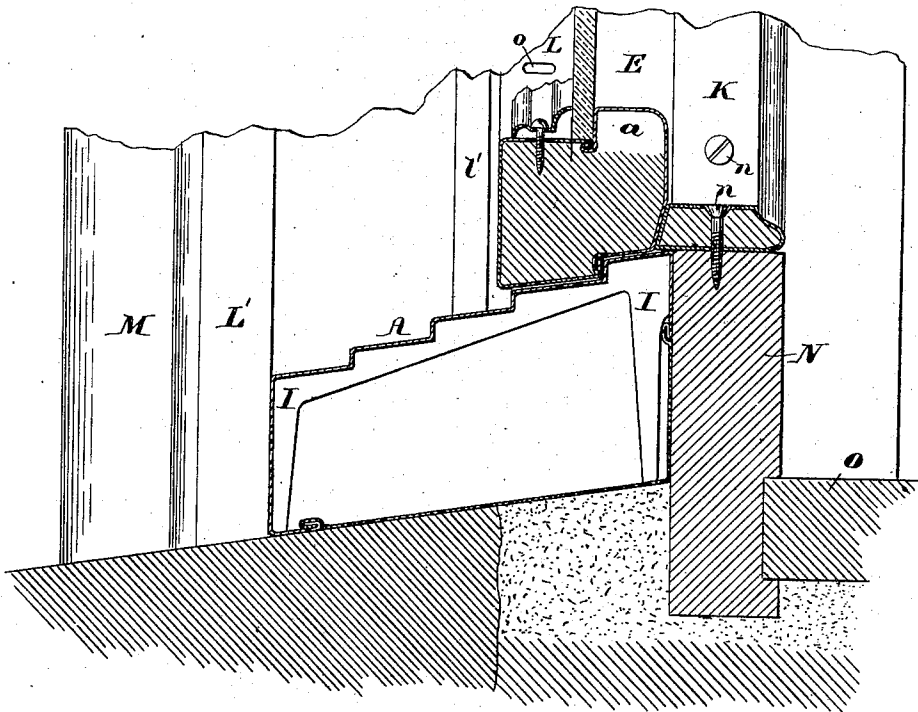


Fig. 2.

Witnesses:
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Inventor:
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(No Model.)

5 Sheets—Sheet 3.

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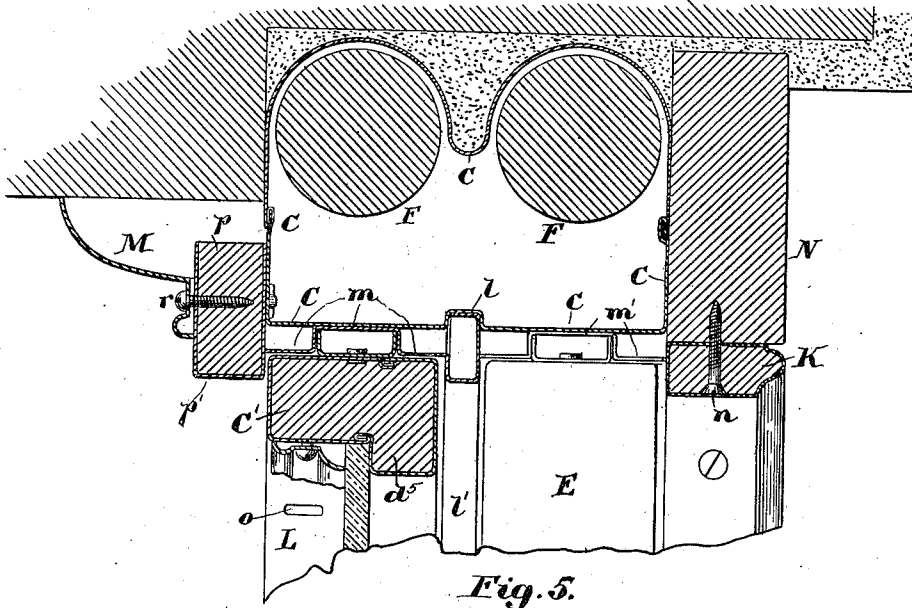


Fig. 5.

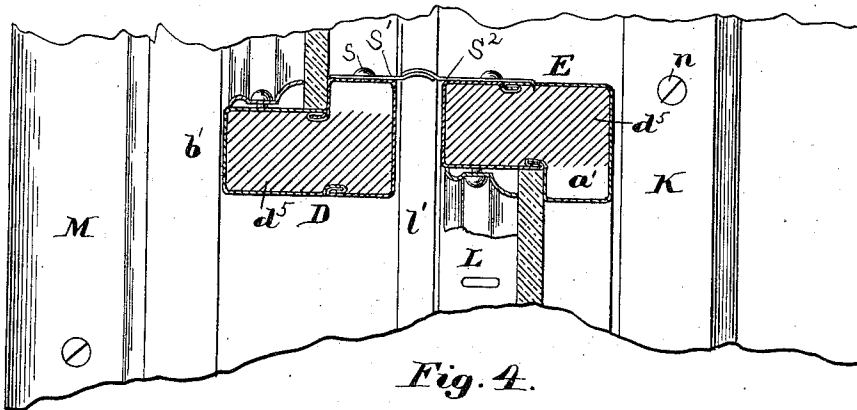


Fig. 4.

Witnesses.

Walter E. Lombard.
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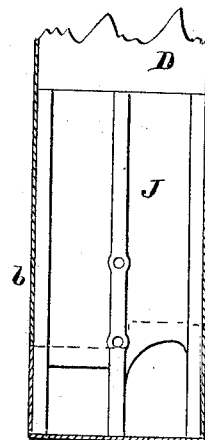
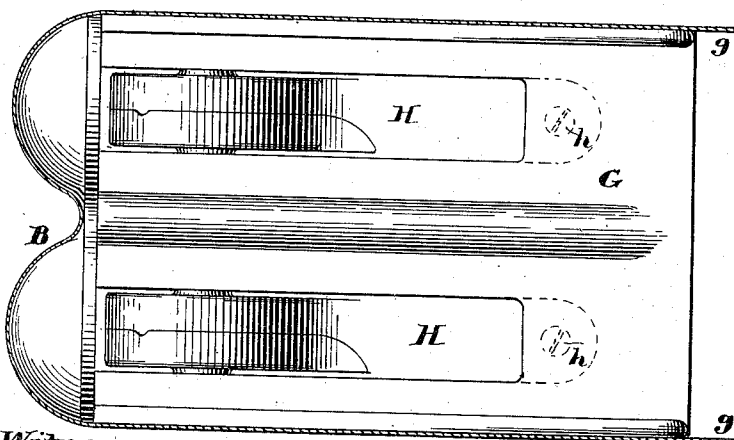
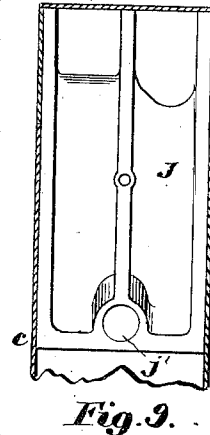
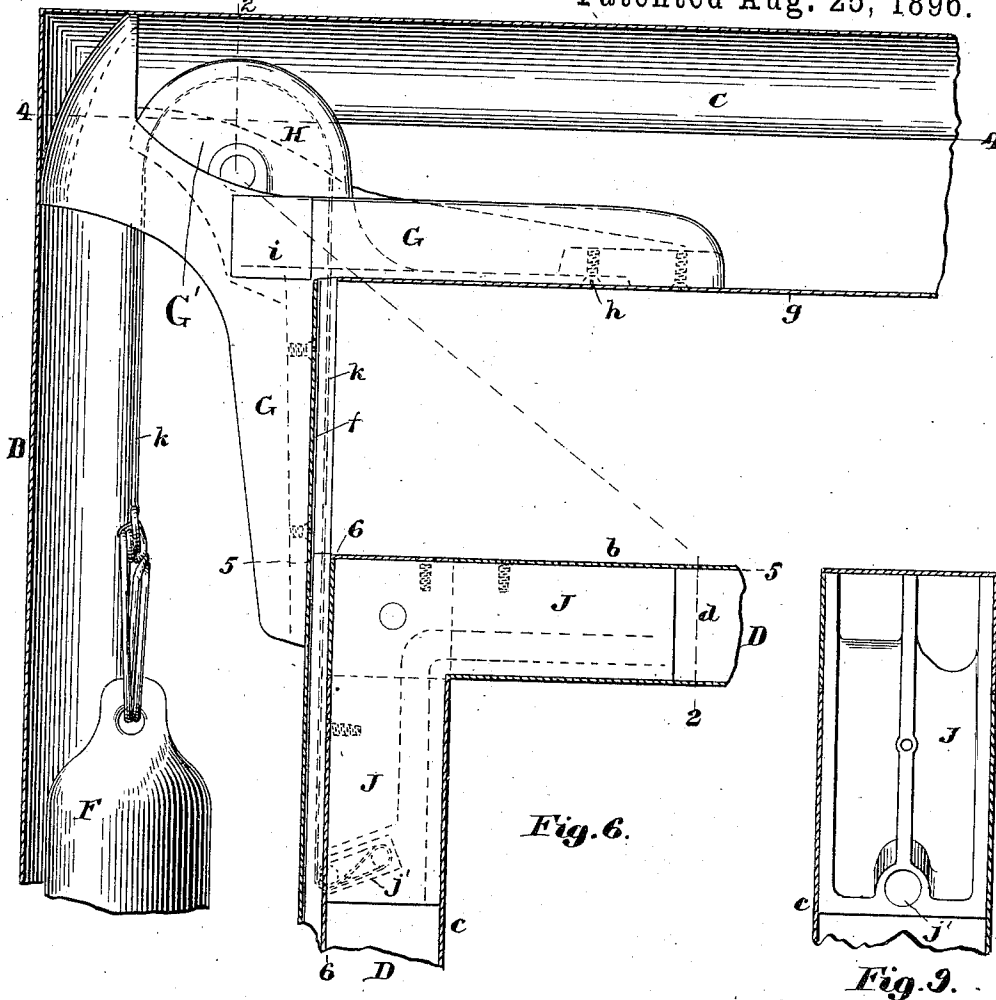
(No Model.)

F. W. STEVENS.
WINDOW.

5 Sheets—Sheet 4.

No. 566,483.

Patented Aug. 25, 1896.



Witnesses:
Halter & Lombard
L. Greenleaf

Inventor: *Fig. 8.*
Frank W. Stevens,
by N. C. Lombard Atty.

(No Model.)

F. W. STEVENS.
WINDOW.

5 Sheets—Sheet 5.

No. 566,483.

Patented Aug. 25, 1896.

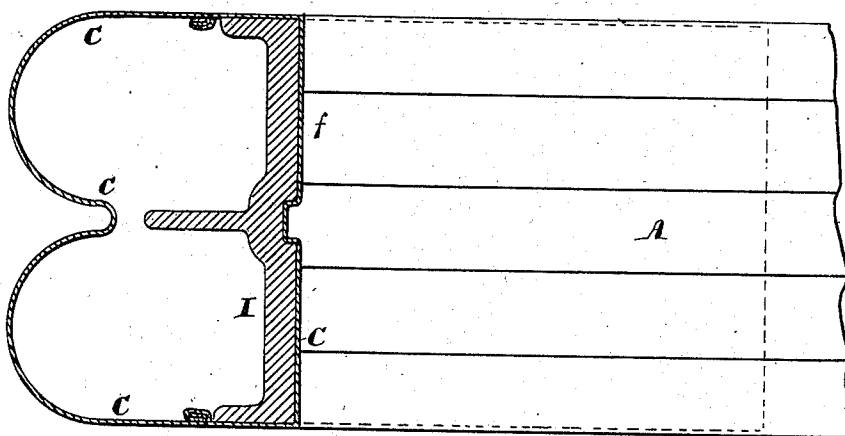


Fig. 11.

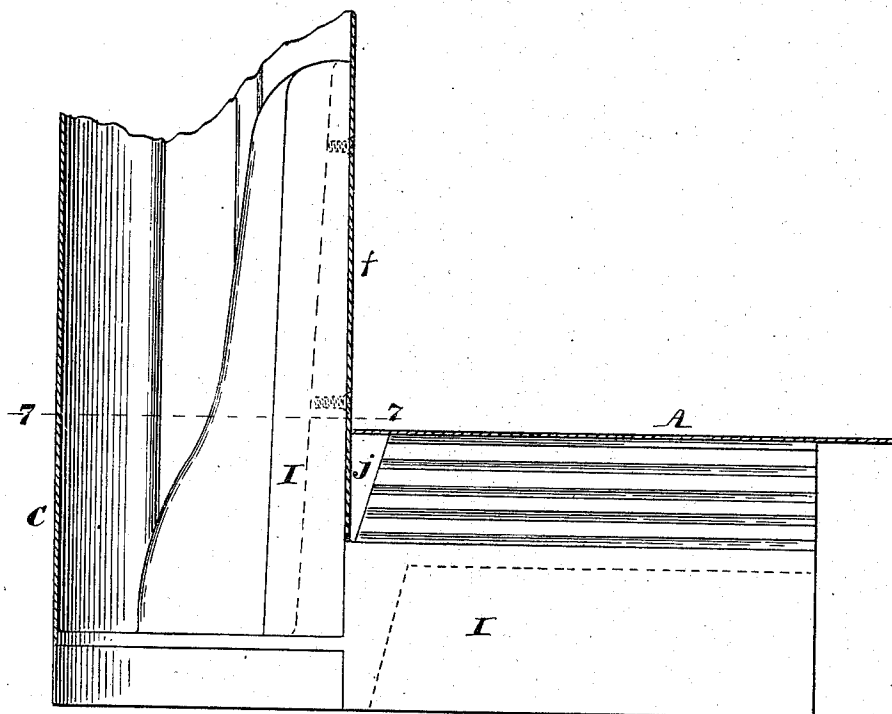


Fig. 10.

Witnesses:

Walter E. Lombard
L. B. Greenleaf

Inventor:

Frank W. Stevens,
by N. C. Lombard
Atty.

UNITED STATES PATENT OFFICE.

FRANK W. STEVENS, OF NEWTON, MASSACHUSETTS.

WINDOW.

SPECIFICATION forming part of Letters Patent No. 566,483, dated August 25, 1896.

Application filed January 2, 1896. Serial No. 574,027. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. STEVENS, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Windows, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to windows, and especially to the construction of the frame and sash of the window, and has for its object the rendering of said frame and sash fire-proof; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings, and to the claims hereto appended, and in which my invention is clearly pointed out.

Figure 1 of the drawings represents an inside elevation of a window frame and sash illustrating my invention. Fig. 2 is a vertical section through the sill of the frame and the lower rail of the lower sash on line 1 1 on Fig. 1, drawn to an enlarged scale. Fig. 3 is a vertical section through the cap of the frame and the upper rail of the upper sash on line 2 2 on Fig. 6. Fig. 4 is a similar section through the meeting-rails of both sashes on line 1 1 on Fig. 1. Fig. 5 is a horizontal section through one of the jambs of the window-frame and one of the stiles of the upper sash on line 3 3 on Fig. 1. Fig. 6 is a sectional elevation of an upper corner of the frame and sash and illustrating the manner of constructing said corners and securing the sash-supporting pulleys to the frame. Fig. 7 is a sectional plan of the frame, the upper wall of the cap-tube being cut away on line 4 4 on Fig. 6. Fig. 8 is a sectional plan of a portion of the sash, the cutting-plane being on line 5 5 on Fig. 6. Fig. 9 is a sectional elevation of the upper portion of the edge of the sash, the cutting-plane being on line 6 6 on Fig. 6. Fig. 10 is a sectional elevation of one of the lower corners of the frame, showing the junction of the sill and jamb; and Fig. 11 is a section on line 7 7 on Fig. 10.

In the drawings, A is the sill of the window-frame; B, the jamb; C, the cap or head of the frame; D, the upper sash, and E the lower sash, said sashes being arranged to slide vertically in the frame and are supported in any

desired position therein by counterbalance-weights F F, as shown.

The sill A, jambs B, cap C, and the rails $a a' b b'$ and stiles $c c$ of the sashes D and E are each composed of a sheet-metal tube molded to the desired cross-section, and, except in the case of the jambs B, may be filled with a core of wood or any other suitable material.

The metallic tubes which form the exterior surfaces of the several members referred to above are each made in two parts connected together by lock-joints, which extend longitudinally thereof, and wherever possible said joints are arranged upon unexposed sides of said members.

As the construction of the several tubes for forming the different members of which the window is composed is substantially the same, except that they vary in cross-section, a description of any one will answer for all so far as relates to the formation of the longitudinal joints by which the two parts of a tube are secured together.

For the purpose of such description the upper rail b of the upper sash D is selected, the outer shell of which is composed of two strips of sheet metal d and d' , the former of which is bent into a channel-iron shape with right-angle corners, and then has each edge turned inward into a position parallel to and removed from the horizontal arms of the channel-iron a distance just equal to the thickness of the sheet metal, thus forming on the edge of each arm of the channel-iron the lip e , as shown. The strip d' is also bent along longitudinal and parallel lines, so as to bring two portions d^2 and d^3 of different widths parallel to each other and at right angles to an intervening portion of said strip, and then said parallel portions are again bent inward at about equal distances from the previous bends.

The narrower inwardly-bent portion is then bent outward again into a position parallel to the plane of the inner surface of the part d^2 from which it was bent inward, and at a distance from said plane equal to twice the thickness of the sheet metal used is again bent outward at right angles to the plane of the part d^2 , and then toward the part d^2 to form the hook-like lip e' , with its outer face

in the same plane as the inner face of the part d^2 .

The wider inwardly-bent portion has a portion thereof bent outward into a position parallel to the plane of the inner face of the part d^3 at a distance from said plane equal to the required depth of rabbet for the glass plus three times the thickness of the sheet metal used. It is then bent outward and then toward the inwardly-turned portion d^4 into a position parallel to the plane of the inner face of the part d^3 and at a distance from said plane equal to the depth of the rabbet for the glass plus the thickness of the sheet metal used to form the hook-like longitudinal lip e^3 . The parts d and d' of the rail b are then united by sliding one part endwise into or upon the other, and then a core d^5 , of wood or other suitable material, is driven endwise into said tube, so as to fill the same to within about two and one-half or three inches of each end of said tube.

Each rail and stile of the sash, the sill, jambs, and cap of the window-frame are made up in substantially the same manner, except that the parts of the tubes of metal vary in shape and size in order to adapt them to the varying cross-sections of the different members, and the jambs of the frame will have no filling or core.

The wall of the jamb-tube B next to the wall of the building is corrugated or curved transversely, so as to form two longitudinal grooves upon its inner face to serve as guideways for the counterbalance-weights F and at the same time stiffen said tube, so that it may the better resist any exterior pressure, and provide for packing with mortar or cement upon its outer surface to hold said jamb firmly in place. The upper wall of the cap-tube C is in like manner and for like purposes curved transversely, and may be filled with a core of wood or other material to within about five inches of each end thereof, or the filling may be omitted.

The jamb B and cap C are connected together at their junctions by means of the angular ribbed casting G, fitted to the inner faces of the walls f of the jamb and g of the cap and secured thereto by screws, the upper portion of said casting having two slots cut through it for the passage through the same of the pulley-stands H H, the inner or lower plate of the cap-tube C having corresponding slots, so that said pulley-stands may be placed in position through said slots and secured to the casting G by a single screw h in each stand, said stands being supported near the pulleys G' by a bearing at i upon the vertical portion of the casting G, all as shown in Fig. 6.

The tubular metal covering of the sill A is made of the desired cross-section and is secured to the jamb B by means of the angular ribbed casting I, secured to the upper wall of the sill and the wall f of the jamb by screws passing through said walls and screwed

into said casting, the wall f of the jamb B extending downward below the upper surface of the horizontal portion of the casting I into the notch j , and the upper wall of the sill-covering extending over said notch and abutting against the wall f , as shown in Fig. 10.

The rails and stiles of the sash are secured together by angular ribbed castings J, extending into the metal tubes of said rails and stiles and secured thereto by screws, as shown in Figs. 6, 8, and 9.

The castings J, which join the upper corners of the sashes, have formed in each of the arms thereof, which are fitted to the stiles of said sashes, an upwardly-inclined circular recess j' to receive the fastening for the weight-supporting ribbon k , the outer wall of the tube of said stile having a corresponding hole registering with the recess in said casting.

The inner face of the jamb B has formed therein a longitudinal rectangular groove l , and has firmly secured thereto upon each side of said groove a sheet-metal guide-plate m and m' , the former extending from the top of the frame to the lower edge of the upper sash when raised and the latter extending upward from the sill to the top of the lower sash when closed, each of said guide-plates having formed on one edge thereof a section of the parting-bead l' .

The guideways in the plates m and m' are made longitudinally tapering from the center of the frame toward the top and bottom of said frame, respectively, and each of the stiles of each sash has secured to its outer edge a sheet-metal guide bent into a channel-iron form and tapered to fit its guideway. These guides and guideways form no part of my invention, as they form the subject-matter of J. H. Shull's application for a patent for improved window appliances, filed December 18, 1895, and serially numbered 572,585.

The stop-beads K are composed of wooden cores and sheet-metal coverings, which cover three sides thereof and a large part of the fourth side, and are secured in position by the screws n , as shown in Figs. 2, 3, and 5.

The glass is secured in position in the sashes by means of putty bedding and tins or tacks, as usual, and a clamping metal molding L, secured in position by wood-screws screwed into the wood filling d^5 through slots o , cut through the metal covering of the stiles and rails, as shown in Figs. 2 and 3.

The staff-bead is composed of a rectangular member L' and the metal molding M, the former of which is composed of the wooden core p and the sheet-metal covering p' , inclosing three sides thereof and secured to the jamb and cap by means of bolts having slotted conical heads at their outer ends and a bar or T-head riveted upon its inner end and adapted to pass through slots cut in the wall of the jamb B, and by turning said bolts one-quarter of a revolution about their axes said member L will be firmly secured in position.

The molding M is secured to the member

L' by means of screws *r*, which pass through holes or slots in the covering of the member L' and screw into the wooden core *p*, as shown in Fig. 5.

5 N N are inside casings of marble or other fireproof material, and O is a portion of the window-stool, also of marble or other suitable fireproof material.

The meeting-rail *b'* of the upper sash has
10 secured to its upper side, by screws *s*, the metal plate *s'*, which extends beyond the front edge of said rail nearly to the front side of the parting-bead *l'* and has said projecting
15 portion curved so as to form a rounded upper surface extending from one parting-bead to the other, and the meeting-rail *a'* of the lower sash has a similar plate *s''*, secured to its upper surface and projecting beyond the outer
20 edge of said rail and curved to fit to and bear upon the curved upper surface of the plate *s'* when both sashes are closed.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A window the main vertical and horizontal members of which have their outer 25 surfaces composed of sheet-metal tubes arranged at right angles to each other and connected together at their junctions by angle-irons within said tubes.

2. A window-frame the jambs and cap of 30 which are composed of sheet-metal tubes which are connected together at the angles of said frame by angle-irons located within said tubes and each provided with slots to receive the pulley-frames; in combination with pul- 35 ley-frames fitted to said slots and secured to said angle-irons.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 28th day 40 of December, A. D. 1895.

FRANK W. STEVENS.

Witnesses:

N. C. LOMBARD,
L. C. GREENLEAF.