

(No Model.)

3 Sheets—Sheet 1.

J. H. SHULL.
WINDOW SASH.

No. 573,545.

Patented Dec. 22, 1896.

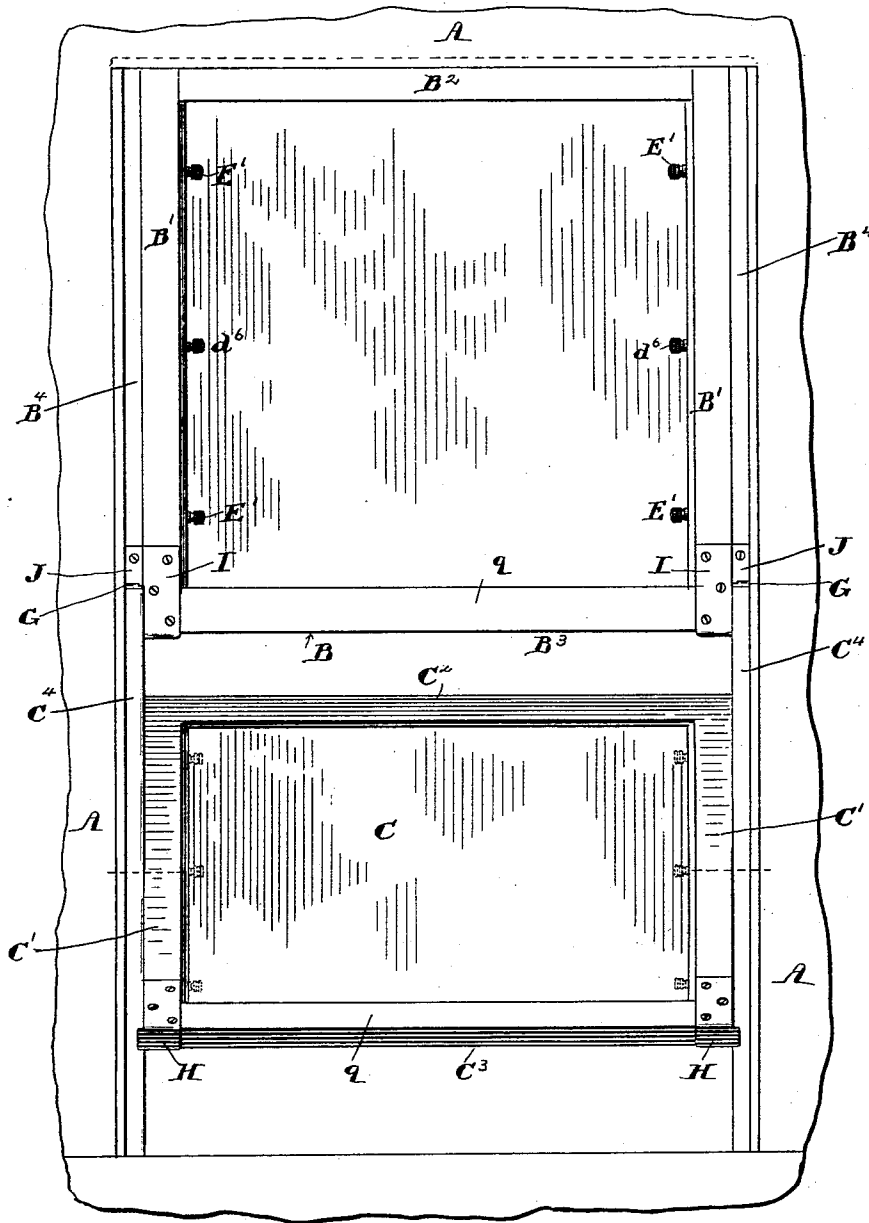


Fig. 1

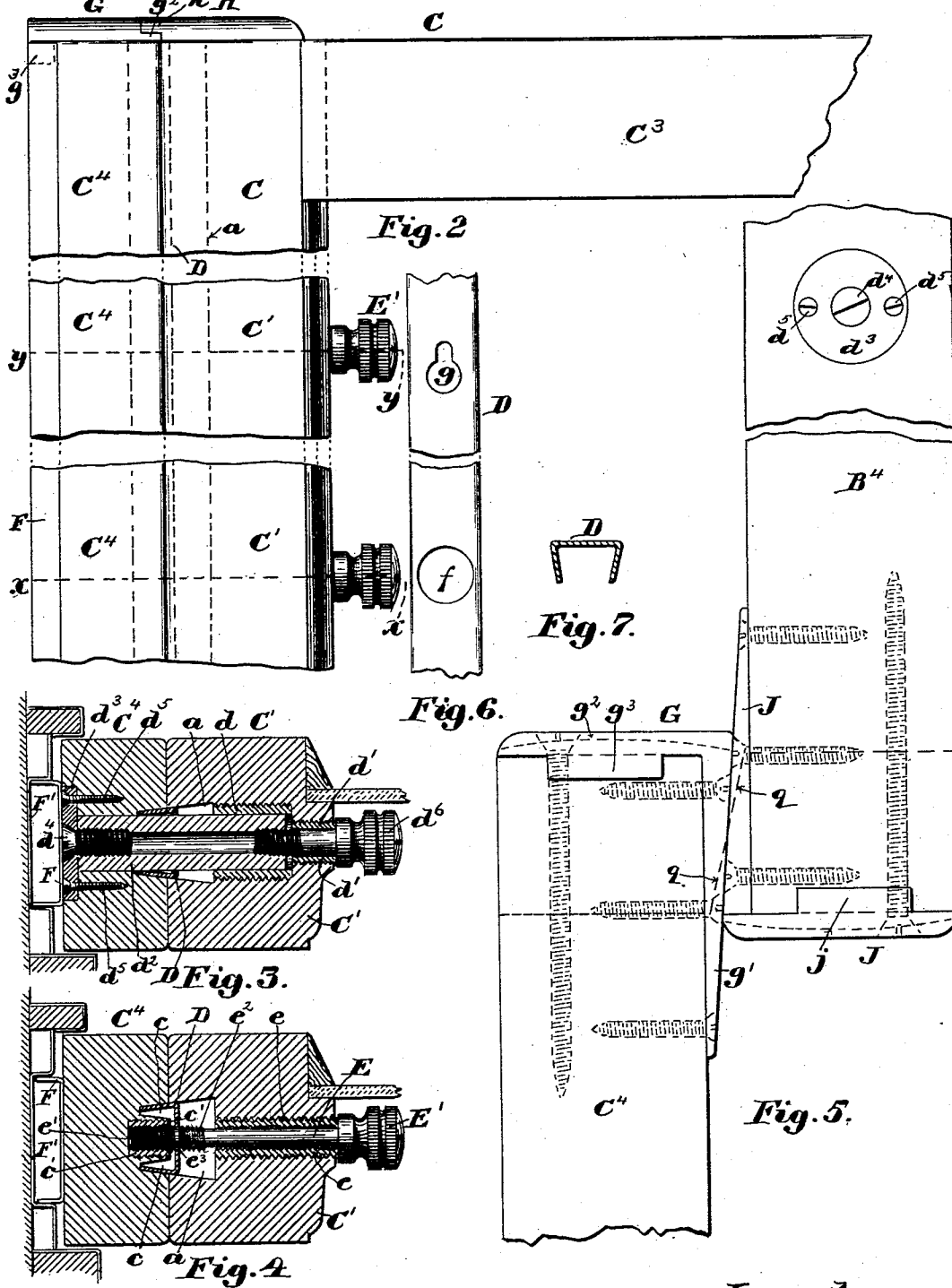
Witnesses:
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L. B. Greenleaf

Inventor:
John H. Shull,
by N. G. Lombard
Atty.

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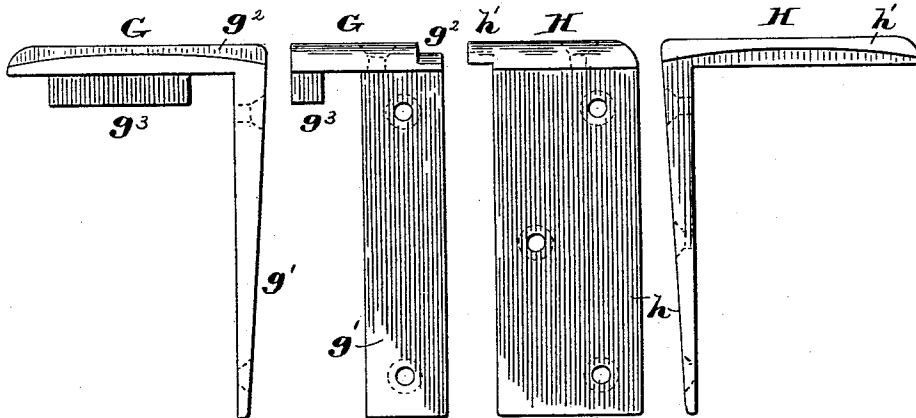


Fig. 11.

Fig. 10.

Fig. 8.

Fig. 9.

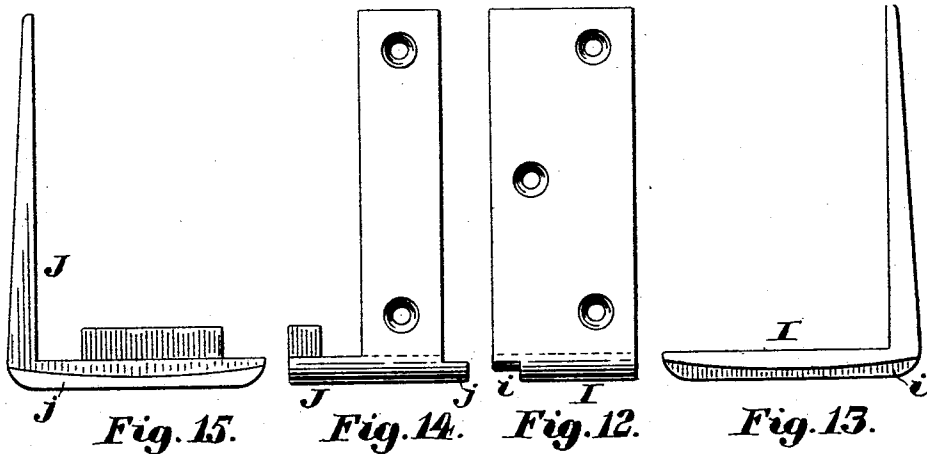


Fig. 15.

Fig. 14.

Fig. 12.

Fig. 13.

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UNITED STATES PATENT OFFICE.

JOHN H. SHULL, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
TO FRANK W. STEVENS, OF NEWTON, MASSACHUSETTS.

WINDOW-SASH.

SPECIFICATION forming part of Letters Patent No. 573,545, dated December 22, 1896.

Application filed April 1, 1896. Serial No. 585,731. (No model.)

To all whom it may concern.

Be it known that I, JOHN H. SHULL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and
5 useful Improvements in Window-Sashes, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to window-sashes; and
10 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, forming a part of this application, and to the claims hereto appended
15 and in which my invention is clearly pointed out.

Figure 1 of the drawings is an inside elevation of a window containing two vertically-
20 sliding sashes embodying my invention with the lower sash moved about its pivotal axis into a convenient position for washing the outer surface of the glass. Fig. 2 is an inside elevation of a portion of one upper corner
25 of the lower sash. Fig. 3 is a transverse section through one of the stiles of the sash on line *xx* on Fig. 2. Fig. 4 is a similar section on line *yy* on Fig. 2. Fig. 5 is an edge elevation of contiguous portions of the two
30 sashes. Figs. 6 and 7 are respectively a partial elevation and a transverse section of the locking and packing tongue for securing the sash-frame proper in a vertical position and preventing the passage of air between the
35 sash proper and the bar to which it is pivoted. Figs. 8 and 9 are respectively a front or inner elevation and an edge view of the metal reinforcing angle-plate for one of the upper corners of the lower sash. Figs. 10 and 11
40 are similar views of the cooperating angle-plate for the upper end of one of the bars to which the lower sash is pivoted. Figs. 12 and 13 are respectively a front elevation and an edge view of the reinforcing angle-plate
45 for one of the lower corners of the frame proper of the upper sash, and Figs. 14 and 15 are similar views of the angle-plate for the lower end of the bar to which the sash-frame proper is pivoted.

50 In the drawings, A represents portions of the inner casings of a window-frame provided

with suitable grooves to receive the upper and lower sashes in a well-known manner.

B is the upper sash, and C is the lower sash, the main bodies of which are of usual
55 construction, except as will be hereinafter described.

B¹ B² are the stiles, B³ the upper rail, and B³ the meeting-rail, of the upper sash. C¹ C²
60 are stiles, C² the lower rail, and C³ the meeting-rail, of the lower sash. Each of the stiles B¹ and C¹ has formed in its outer edge the longitudinal groove *a*, the side walls of which are inclined toward each other, as shown in
65 Figs. 3 and 4.

B⁴ and C⁴ are bars or strips of wood having a width corresponding to the thickness
70 of the sash and a length equal to the length of the sash, and each of said bars has formed in the side thereof that is in contact with the stile of the sash two parallel longitudinal
75 grooves *c c*, the walls of which diverge from each other, said grooves being so formed and arranged that the outer side wall of each groove shall coincide with and form an extension
80 of a side wall of the groove *a* when said bar is secured to the stile of the sash, as shown in Figs. 3 and 4.

Each sash has secured to each vertical edge thereof one of the bars B⁴ or C⁴ in the following
85 manner: Each stile of the sash has set therein at the center of its height an exteriorly-threaded bushing *d*, extending from the bottom or inner wall of the groove *a* about
90 two-thirds of the distance to the inner or molded face of the stile, and a second bushing *d'*, screwed into the stile in axial line with the bushing *d* and extending from the inner
95 end of said bushing *d* to and slightly beyond said molded face of the stile. Each stile of the sash also has two other metal bushings
100 *e e* set therein, one above and one below the center of the height of the sash, said bushings being threaded exteriorly and interiorly and extending from the bottom or inner wall of the groove *a* to and slightly beyond the molded inner face of the stile.

The stile extension-bars B⁴ and C⁴ each has firmly secured therein at the middle of its
length the tubular pivot-pin *d*², having the
105 flange *d*³ formed thereon or secured thereto by the screw *d*⁴, which engages a female screw-

thread formed in one end of said pivot-pin d^2 , said flange d^3 being secured to the said bar by screws d^5 .

The pivot-pin d^2 projects beyond the inner face of the stile extension-bar through a hole f in the locking and packing tongue D and into the bushing d and is secured therein by the screw d^6 , which engages a female thread in the inner end of the pin d^2 , as shown in Fig. 3. The stile extension-bar also has set in its inner face, between the grooves $c c$, two exteriorly and interiorly threaded bushings c' , one above and one below the pivot-pin d^2 and in axial line with the bushings $e e$, set in the sash-stile, as shown in Fig. 4.

E is a locking-screw provided with a milled and slotted head E' and having a portion of its opposite end threaded in two short sections e' and e^2 , said thread-sections being separated by a circumferential groove e^3 to receive and engage the packing-tongue D in such a manner that an endwise movement of said screw E will cause a corresponding lateral movement of said tongue.

When the screws E E are in the positions shown in Figs. 2 and 4, the tongue D will be forced into the grooves $c c$, so as to bear close against the outer inclined walls of said grooves and against the outer portion of the side walls of the groove a , and thus effectually prevent any passage of air through the joint between the stile proper and its extension-bar, and at the same time the bar is drawn into close contact with the stile of the sash.

The tongue D has formed therein at the proper distance above and below the opening f two pear-shaped openings $g g$, the larger parts of which are of sufficient size to permit the passage of the threaded portion of the screw E, while the upper or narrower portions are of suitable widths to fit the necks of said screws, formed by the circumferential grooves e^3 , and the centers of the narrower portions of the openings $g g$ are located at the same distances above and below the center of the hole f as the centers of the screws E E are above and below the axis of the pivot-pin d^2 .

In applying the extension-bar to the stile the sheet-metal tongue having the cross-section shown in Fig. 7 is placed in the groove a by sliding it endwise therein until the larger parts of the openings $g g$ are opposite the bushings $e e$, when the screws E E are screwed through said bushings until the web of said tongue is in the same plane as the groove or neck e^3 , when the tongue D is moved endwise until the narrower parts of the openings $g g$ engage said neck, when the hole f is in proper position for the pin d^2 to be passed through it and into the bushing d , when the screw d^6 is screwed into said pin, as shown in Fig. 3. Now if the screws E E be screwed in still farther the tongue D will be moved partially out of the groove a and into the grooves $c c$ until its two outer inclined surfaces are forced into contact with the outer inclined walls of the grooves $c c$ and the outer

portion of the inclined side walls of the groove a , at which time the thread-section e^2 will have been turned entirely out of the thread of the bushing e , as shown in Fig. 4, and the bar B^4 or C^4 will have been drawn into firm contact with the edge of the stile by the head of the screws E E coming in contact with the end of the bushings $e e$, as shown.

The bars B^4 and C^4 are fitted to the usual guideways in the window-frame and may or not be provided with the metal guides F to fit the tapered guideways F', attached to the window-frame, which are no part of my present invention, and said bars are connected in any suitable manner to counterbalance-weights, which support the sashes in any desired position in a well-known manner.

The meeting-rails of the upper and lower sashes, instead of being provided with the usual overlapping lips, have their contiguous faces beveled, as indicated by the dotted line q in Fig. 5.

The upper ends of the stile extension-bars of the lower sash have secured thereto metal angle-plates G, covering the tops of said bars and extending down the outer edges of said bars in the form of wedges g' and having portions of their top plates toward the main sash-stiles rabbeted, as at g^2 , with the upper surfaces of said rabbets curved to an arc of a circle concentric with the axis of the pin d^2 , and may or not be provided with the lug g^3 , according as the said bars are provided with the tapered metal guides F or not.

The upper ends of the stiles of the lower sash have secured thereto similar metal angle-plates H, having corresponding downwardly-projecting wedges h and provided with overhanging lips h' , the under surfaces of which are curved to an arc of a circle to fit the upper surfaces of the rabbets g^2 of the angle-plates G.

The lower end of the stiles and stile extension-bars of the upper sash have similar angle-plates I and J secured thereto, but the rabbets i in this case are formed on the plates I, that cover the ends of the stiles, and the projecting lips j are formed on the angle-plates J, that cover the ends of the bars.

The object of the lips on said angle-plates overlapping the rabbets on their companion plates is to assist in holding the weight of the sash proper and relieve the strain upon the pivot-pins.

The wedges or inclined surfaces on the angle-plates G, H, I, and J and the inclined surfaces of the meeting-rails cooperate when the sashes are closed to press the sashes apart and hard against the outer wall of one groove and the inner wall of the other groove of the frame in which they are fitted to slide, but as soon as either sash is moved from a closed position they are relieved from lateral pressure and can be easily moved in either direction.

When the stile extension-bars are secured to the sash as above described, the sash may be used as any vertically-movable sliding

sash, but whenever desired either sash may be rotated about its pivotal connection to its stile extension-bars into a horizontal or inclined position by simply slackening the screws d^b and turning the screws E E outward to withdraw the tongue D from the grooves c and disengage said screws from the bushings c' , when the sash may be revolved into any desired position for washing the inner or outer surfaces of the glass, and said sash may be secured in said desired position by tightening the screw d^b .

In withdrawing the screws E from the bushings c' the section e^2 of the thread thereon will engage the female thread of the bushing e before the section e' of said thread leaves the thread in the bushing c' , and in screwing said screws E in again the thread-section e' will engage the thread of the bushing c' before the thread-section e^2 leaves the thread of the bushing e .

Portions of my invention are equally applicable to "French casements," so called, which revolve about vertical axes for the purpose of making said casements more effectually exclude the passage of air, water, and dust.

The bars to which the sash is pivoted are drawn into firm contact with the stiles of the sash, when parallel thereto, by the screws d^b and E E, and when the sash is rotated about its pivot it is secured in the desired positions by the screws d^c .

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

1. A window-sash each stile proper of which has formed, in its outer edge, a dovetailed groove extending longitudinally thereof; in combination with a stile extension-bar, pivoted to the outer face of each stile proper, at or near the middle of its length, and provided upon its face next to said stile with two longitudinal grooves having diverging side walls; a locking and packing tongue having two opposing inclined sides, mounted in and extending longitudinally of the groove in said stile and adapted to be moved into the grooves in the stile extension-bar; and means for moving said tongue toward and from said bar.

2. A window-sash each stile proper of which has formed in its outer edge a dovetailed groove extending longitudinally thereof; in combination with a stile extension-bar pivoted to the outer edge of each stile and having in its face next to said stile two longitudinal grooves having diverging side walls; a packing-tongue of sheet metal having an

[-shaped cross-section with two opposing sides inclined toward each other and provided with the openings f and g mounted in the groove in each of said stiles, and movable laterally toward and from the grooves in said bar; the exteriorly and interiorly threaded metal bushings e and c' set, respectively, in the stile and the stile extension-bar; the screw E provided with the two threaded sections e' and e^2 , and with the circumferential groove or neck e^3 separating said threaded sections and adapted to engage the narrower part of the opening g in the packing-tongue.

3. A window-sash having a dovetailed longitudinal groove formed in the outer edge of each stile; suitable metal bushings set in said stile between the bottom or inner wall of said groove and the inner or molded edge of each stile and at or near the center of the height of said stiles; two stile extension-bars each having two longitudinal grooves formed in its face contiguous to the stile; a pivot-pin set in a fixed position in said bar, and fitted to a bearing in one of said bushings; a clamping-screw fitted to the other of said bushings and screwed into said pivot-pin; the metal packing-tongue D provided with the opening f to receive said pivot-pin; and means for moving said tongue laterally toward and from said bar, to pack the joint between said bar and the stile of the sash.

4. The combination in a window of a pair of vertically-sliding bars fitted to the guide-ways of a window-frame; a sash pivoted to said bars at or near the middle of the height of said sash; a pair of metal angle-plates secured to the meeting-rail end of said sash contiguous to said bars; similar angle-plates secured to the ends of said bars contiguous to the meeting-rail ends of said sash, the angle-plate on the end of a bar and the angle-plate contiguous thereto upon the sash being provided, one with a projecting lip, and the other with a rabbet to receive said lip the contact-surfaces between said lip and rabbet being arcs of circles concentric with the axis of the pivot-pin about which the sash may be revolved.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 31st day of March, A. D. 1896.

JOHN H. SHULL.

Witnesses:

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