No. 724,136. PATENTED MAR. 31, 1903.

H. C. SMITH.

WINDOW.

APPLICATION FILED JUNE 21, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

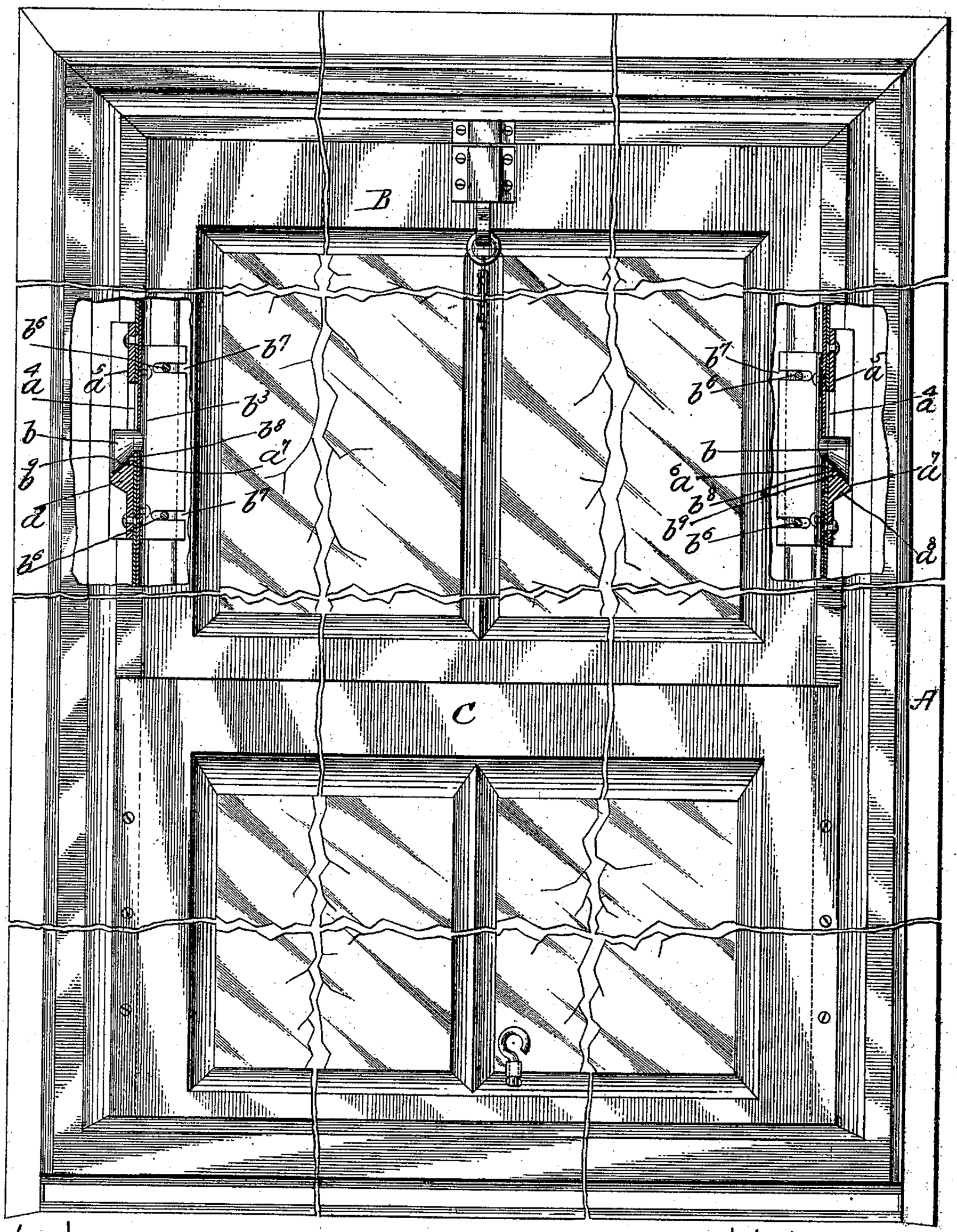

Fig. 1.

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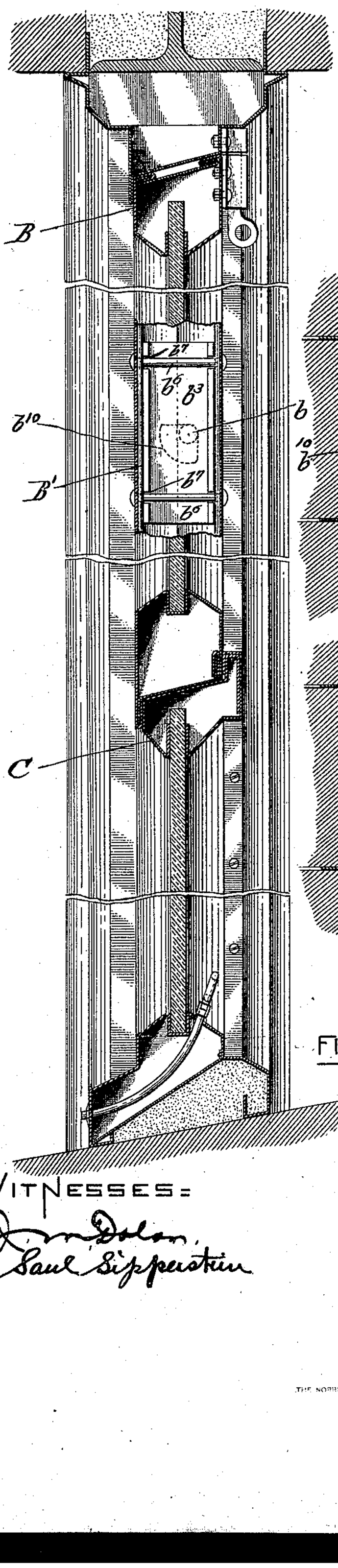

Fig. 2.

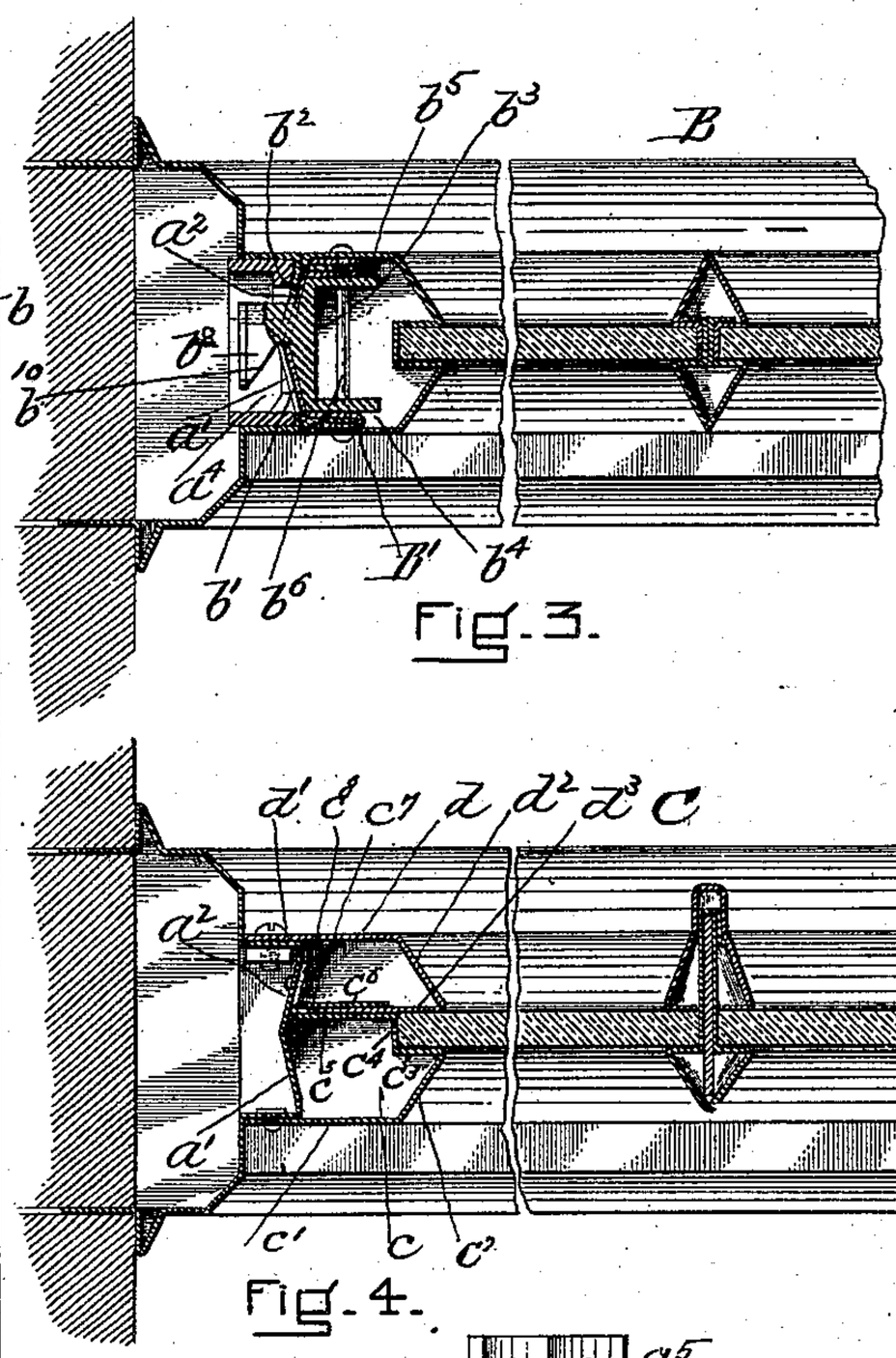

Fig. 3.

Fig. 4.

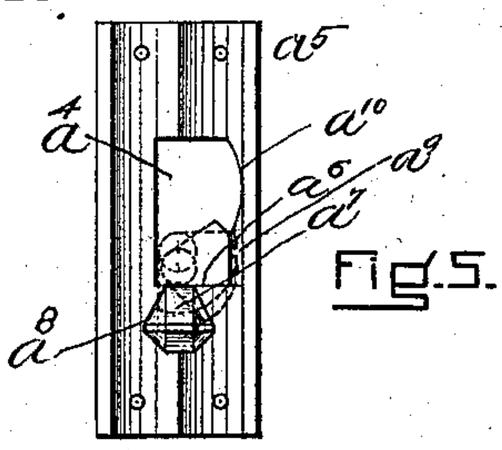

Fig. 5.

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UNITED STATES PATENT OFFICE.

HENRY C. SMITH, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO SMITH-WARREN COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WINDOW.

SPECIFICATION forming part of Letters Patent No. 724,136, dated March 31, 1903.

Application filed June 21, 1902. Serial No. 112,706. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SMITH, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Windows, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to an improvement in windows, and essentially to the means by which a sash of normally closed vertical extension having its sides sufficiently secured within the interior facing of the frame to provide a weather-proof joint may be revolved to any degree of opening crosswise the frame without the removal of any part and upon the return of the sash to its normally closed position the recessing of its edges within the sides of the frame may be automatically reobtained and their weather-proof joint therewith reëstablished. The means for obtaining this adjustment, together with other improvements in the combination and organization of parts, may best be seen by reference to the drawings, wherein—

Figure 1 shows the sashes in elevation and broken away in part to show the pivotal construction of the upper sash. Fig. 2 shows the sashes in vertical cross-section. Fig. 3 shows a horizontal section through the upper sash. Fig. 4 is a horizontal cross-section through the stationary lower sash. Fig. 5 shows in elevation a detail of construction of which mention will hereinafter be made.

Referring to the drawings, A is the window-frame. B, the upper sash, is represented in a vertically-extending closed position; but it is adapted to revolve to a more or less open position crosswise the frame, and C is the lower sash, which has a fixed relation to the frame.

In order not to anticipate a detailed description of the pivotal connection of the upper sash, it is sufficient to say at this point that the sides of the sash are provided with supporting-trunnions *b*, which have suitable bearings within the sides of the frame. Furthermore, the normal position of the sash is a closed one in vertical extension, which result is obtained by overbalancing or weighting its under side.

In order to appreciate the scope of my invention, it is to be noted that the sash B, although it is a pivoting sash, makes a weather-proof fastening along its edges within the interior facing of the frame. In other words, the edges of the sash extend into and along the frame, as though the sash was of vertical movement. It is therefore within the scope of my invention to provide means by which a sash thus extending and secured can be pivoted to an open position crosswise the frame, and not only this, but upon the closing of the sash the recessing of its edges within the sides of the frame may be automatically reobtained. Primarily this result is made possible by the construction of the interior side facings to the frame, which have a groove or recessing along their entire vertical extension. This is best seen in Fig. 3 and indicated by the obtuse angular relationship of the sides or walls a' a^2. In other respects the frame may be of any suitable construction. Extending into the grooves or recesses a are the movable sash extensions B′, which rest along their edges flush up against the sides a' a^2 with their corresponding sides b' b^2. These side extensions B′ are attached to the fixed body of the side rails to the sash, toward and from which they are movable telescopically, so that when extended out into the recessed interior of the frame the sash becomes locked against an outward or inward movement, but when withdrawn the sash may be taken out or reversed to a position crosswise the frame. It is also to be noted that the sides b' b^2 of the telescopic extension, beveling out, as they do, and resting at an inclined angle within the grooved wall of the frame, are drawn or rather wear against these inclined frame sides a' a^2 when the sash is wrenched at the top or bottom and the telescopic side extensions are forced back into the fixed body of the sash. This is especially true of the sash when pivoting. The trunnions *b*, which extend from the side extensions, not only act as a center upon which the sash may turn, but extending as they do from the sash at or near the center of its length

they facilitate the forcing of the side extensions against the edge of the frame in the fact that upon wrenching the top and bottom of the sash move in reverse directions and the cramping of the side extensions is primarily obtained at both ends. The trunnions are drawn in by the cramping back of the side extensions, which movement is taken advantage of, as will be described later. It is sufficient to say at this point that the trunnions upon their withdrawal do not lose their bearings within the sides of the frame.

The trunnions *b*, while they extend from and are movable with the side extensions, in point of fact extend through them from the castings b^3, contained within their hollow shells and of which the trunnions form an integral part. The shape of their castings b^3 is preferably as represented. They are made of considerable body in order that they may amply support the trunnions and also of some length in order that they may reinforce the shells of the extension-pieces, and especially their beveled facings, as much as may be necessary. They comprise also the side plates b^4 b^5, which reinforce the sides of the extension-pieces.

The extension sides are retained in position so as to telescope in and out of the fixed body of the sash by means of the pins b^6. The pins or bolts extend crosswise the fixed sash side and pin through the sides of the extension-pieces and also the reinforcing side plates b^4 b^5. In order that a lateral movement of the side extensions may be obtained, slots b^7 are cut in their sides and also through their reinforcements at the points where the pins b^6 are inserted, so that practically the pins b^6 not only support the extending sides, but serve also as guides upon which they may be laterally projected, the slots b^7 being commensurate with the extent of their lateral movement.

Thus far I have described the means by which the extension sides may be forced back into the fixed body of the sash upon its pivoting and the sash revolved to an open position crosswise the frame. I have also arranged that the side pieces may be automatically drawn back into the grooved recessing of the frame side when the sash becomes closed in vertical extension and a weatherproof joint established.

The trunnions *b*, it is to be observed, are contained within the sides of the frame by extending through the openings a^4. These openings are also cut through plates a^5, which reinforce the interior of the frame in order that secure bearing for the trunnions may be obtained. The trunnions *b* would naturally rest upon the undercut edges a^6 of the openings a^4, and being of sufficient extension would be drawn in by the side extensions as they were pressed back by the contact of their beveled edges with the side of the frame upon wrenching open the sash. In order, however, that these trunnions may be automatically drawn out when the sash becomes closed, and being drawn out may also draw out the edges of the side extensions into the recessed sides of the frame, I have extended from the ends of the respective trunnions heads b^8, which have drawing edges b^9. When the sash is in a closed vertical position, as is best shown in Fig. 1, these edges b^9 are adapted to ride up and rest upon the beveled edges a^7 of the studs a^8, extending from the reinforcing-plates a^5, and the relation of these parts is such that when this adjustment is obtained the sash is lifted and the necks of the trunnions no longer bear upon the cut edges a^6 of the frame and its reinforcing-plates, but at their headed ends they rest obliquely along their drawing edges b^9 upon the studs a^8. The result is therefore obtained that the extension side pieces of the sash are drawn out when they come in alinement with the grooved interior facing of the frame side, for the weight of the sash bearing down obliquely along the beveled edges b^9 of the trunnions upon the correspondingly-beveled edges of the studs will be sufficient to draw them out. In other words, the studs a^8 form wedges, which spread or press out the trunnions as their obliquely-beveled edges are forced down upon them by the weight of the sash and they in turn being connected with the telescopic side pieces draw them out into the frame sides. It is to be observed that the headed ends of the trunnions do not ride up upon the beveled edges of the studs until the window is closed or nearly closed. This is in order that no binding stress may be exerted upon the side pieces during the pivoting of the sash, but only upon its becoming approximately closed. Until then after the side extension-pieces have been telescoped in by their cramping against the sides of the frame, as before described, the trunnions rest upon the edges a^6 of the frame, and the sash is free to pivot or revolve to any position crosswise the frame and without binding against its sides. This is best seen and the varying positions of the trunnions in their bearings may be better understood, perhaps, by reference to Fig. 5, where I have shown in dotted lines the relative positions of their headed ends, one corresponding with the closed position of the sash, with the headed end of the trunnion resting upon the stud a^8, the other corresponding with an open position of the sash when the neck of the trunnion rests upon the edge a^6 and the headed end of the trunnion is swung away from the stud, and in this connection it is to be observed that the headed end of the trunnion would swing away from its bearing upon the stud upon a very slight degree of opening of the sash.

In order that there may be an impossibility of the trunnions being drawn through the openings a^5, it may be seen by reference to Fig. 5 that the trunnion is practically locked

against withdrawal by the lateral projecting section b^{10}, which is extended back of and beyond the edge a^9 of the openings. The trunnions may, however, be withdrawn by lifting the sash and then withdrawing them through the upper part of the opening, where it is widened at the point a^{10} sufficiently to permit of the headed end of the trunnion being drawn through.

The fixed sash C, which I have shown in my improved window by reason of its adaptability for use with a revolving sash, comprises improvement in a built-up side rail especially applicable to the grooved interior facing of the frame, which is so necessary to the adjustment of the revolving sash and which, as may be seen by reference to Fig. 4, extends the vertical length of the window. The side rail comprises the sections c and d, formed by different foldings of their short vertical sides. The inner section c comprises the interior side c', which is secured to the edge of the frame by suitable bolts or screws. This side is continued by the side c^2 to form the interior glass-rest c^3, which is turned to form a flange c^4, which retains the edge of the glass. This side c^4 is then extended back to the facing of the frame by the side c^5, the edge c^6 of which is then turned so that there is formed a vertically-extending pocket c^7. In order that the side c^5 may be attached to the side of the frame, clips c^8 are cut from its edge c^6. These connect with the frame. The section d comprises the exterior side d', which is suitably attached to the outer side of the frame, and the side d^2 bent in to form the outer glass-rest by the side d^3, which is continued in to fit into and along the pocket c^7 of the interior section aforesaid. This construction is extremely simple and may readily be attached to any frame side as well as the one which I have hereinbefore described.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A window-frame having an interior facing, a sash having telescopic side extensions adapted to make jointed connection therewith, trunnions extending from said movable side extensions with suitable bearings within the sides of the frame, and means for the withdrawal of said side extensions that the said sash may be revolved to a position crosswise the frame substantially as described.

2. In a window-frame, a sash having outwardly-movable side extensions, and trunnions extending therefrom having suitable bearings within the frame sides, the said sash side extensions being adapted along their edges to make wearing-surfaces with the interior sides of the frame upon the pivoting of said sash, and by which they are thrown back into the main sash-body as and for the purposes set forth.

3. A window-frame having a grooved interior facing, a sash having outwardly-movable side rail extensions the edges of which are adapted to be contained therein, trunnions extending from said movable side extensions having bearings within the frame sides, the said sash-rail extensions being adapted along their edges to make wearing-surfaces with the grooved interior facings of the frame upon the pivoting of said sash, and be pressed back into the main sash-body, as and for the purposes set forth.

4. A window-frame having an interior facing, a sash having movable side extensions adapted to make jointed connection therewith, trunnions extending from said extensions having suitable bearings within the frame sides, means for the withdrawal of said side extensions that the sash may swing crosswise the frame, and means for extending them that the jointed engagement with the interior facing of the frame may be resumed when the sash has become closed substantially as described.

5. A window-frame having an interior facing, a sash having movable side extensions adapted to make jointed connection therewith, trunnions extending from said side extensions having suitable bearings within the corresponding frame sides, means for the withdrawal of said side extensions from their jointed engagement with the interior facing of the frame sides upon a pivoting of the sash that it may be revolved to an open position crosswise the frame, and means for automatically returning the said side extensions that the jointed engagement aforesaid with the frame sides may be resumed when the sash has become closed substantially as described.

6. A window-frame having an interior facing, a sash having movable side extensions adapted to make jointed connection therewith, trunnions extending from and movable with said side extensions, having suitable bearings within the corresponding frame sides, means for the withdrawal of said side extensions from their jointed engagement with the interior facing of the frame sides upon a pivoting of the sash that it may be revolved to an open position crosswise the frame, and a drawing edge extending from said trunnions adapted to suitably contact with a fixed stud or other projection that the said side extension-pieces may be drawn out and the jointed connection between the sash and the interior facing of the frame may be automatically reobtained when the sash has become closed substantially as described.

7. A window-frame having a grooved interior facing, a sash having outwardly-movable side extensions the edges of which are contained therein, but which upon a wrenching of said sash are adapted to wear against the walls of said interior facing to the frame and the side extensions become pressed back into the fixed body of the sash when the sash may be swung to a position crosswise the frame, trunnions extending from and movable with

said side extensions having suitable bearings within the frame sides, means for preventing the trunnions from being withdrawn so as to leave their bearings within the frame sides, and a drawing edge extending from said trunnions adapted to suitably contact with a fixed stud or other projection that the side extension-pieces may be drawn out, and the connection between the sash and the interior facing of the frame may be automatically reobtained when the sash has become closed substantially as described.

8. In a window-frame, a fixed sash the side rails of which make detachable attachment with the frame in two sections, one of which is shaped to form one side and the end of a glass-retaining recess together with a vertically-extending pocket for containing the edge of the other section, and the other section adapted to form the other side rest for the glass and be contained along its edge within said pocket that an interlocking connection may be formed substantially as described.

9. A window-frame, a pivoted window-sash, an interposed, laterally-movable, joint-forming connection between them, means whereby the said joint-forming connection may be moved in one direction by the sash in opening, and means whereby the same may be moved in a reverse direction by the sash in closing.

10. A window-frame, a pivoted window-sash, an interposed, laterally-movable, joint-forming connection between them, means whereby the said joint-forming connection may be moved in one direction by the sash in opening, and means whereby the same may be moved in a reverse direction by the sash in closing, but only when the sash has been turned to an approximately closed position, as and for the purposes set forth.

11. A window-frame, a pivoted window-sash adapted to be contained therein, and having movable side rail extensions adapted to make a jointed connection therewith, whereby the said side extensions may be automatically pressed back upon the turned opening of the sash, and means whereby they may be automatically and yieldingly drawn out, that the jointed connection with the frame may be reestablished when the sash has been swung to an approximately closed position, substantially as described.

12. A window-frame, a pivoted sash contained therein, and having movable side rail extensions adapted to make jointed connection therewith, trunnions extending from said movable extensions having suitable bearings within the sides of the frame, headed end parts to said trunnions and fixed studs so arranged that the said headed ends of the trunnions will contact against them upon the turning of the sash from an open to a closed position, as and for the purposes set forth.

13. A window-frame, a pivoted sash contained therein, and having movable side rail extensions adapted to make jointed connection therewith, trunnions extending from said movable extensions having suitable bearings within the sides of the frame, means whereby said movable extensions may be pressed back into the fixed body of the sash upon swinging the sash to an open position crosswise the frame, and means whereby the same may be automatically drawn out when the sash is swung to an approximately closed position, comprising headed ends b^8 of the trunnions in combination with fixed studs a^8 both constructed to have bearing, substantially as described.

14. A window-frame, a pivoted sash contained therein and having movable side rail extensions adapted to make jointed connection therewith, guides for said movable extensions, trunnions extending therefrom having parts b^3 and with their outer ends having suitable bearing within the sides of the frame, means whereby said movable side rail extensions may be pressed back into the fixed body of the sash upon swinging the sash to an open position crosswise the frame, and means whereby the same may be automatically drawn out when the sash is swung to an approximately closed position, comprising headed end parts b^8 of the trunnions in combination with the studs a^8 fixed to the frame, both constructed to have bearing with one another, substantially as described.

15. In a window-frame, a revolving sash adapted to be contained therein, and having telescopic side extensions adapted to make jointed connection therewith, and pivot castings or trunnions upon which the said sash may pivot, which are secured to the said side extensions, and having an enlarged exterior end, a casting secured to the interior of the frame having an inclined face against which the enlarged end of the trunnion is brought to bear when the sash is in a certain position, and in such manner that the said telescopic side extensions are drawn out that their jointed connection with the frame may be made substantially as described.

16. A window-frame having a grooved interior facing, a sash having outwardly-movable side extensions the edges of which are adapted to be contained therein, trunnions extending from, and movable with said side extensions having bearings within the frame sides, means whereby the movable side extensions may be pressed back that the sash may pivot on the trunnions aforesaid and swing crosswise the frame, and means carried by the trunnions, whereby the same may draw out the movable side extensions that their jointed engagement may be reëstablished with the frame.

17. A window-frame having a grooved interior facing, a sash having laterally-movable side extensions contained therein, trunnions secured to, and movable with said side extensions having suitable bearings within the

sides of the frame, means whereby the movable side extensions may be automatically withdrawn from the frame by wrenching, that the sash may pivot upon the trunnions aforesaid and swing crosswise the frame, and means carried by the trunnions whereby the same may draw out the side extensions, that their jointed engagement with the sides of the frame may be reëstablished when the sash has been swung to an approximately closed vertical position, substantially as described.

HENRY C. SMITH.

In presence of—
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L. M. CUTTER.