No. 797,147. PATENTED AUG. 15, 1905.

O. M. OTTE.

WINDOW SASH.

APPLICATION FILED DEC. 3, 1904.

2 SHEETS—SHEET 1.

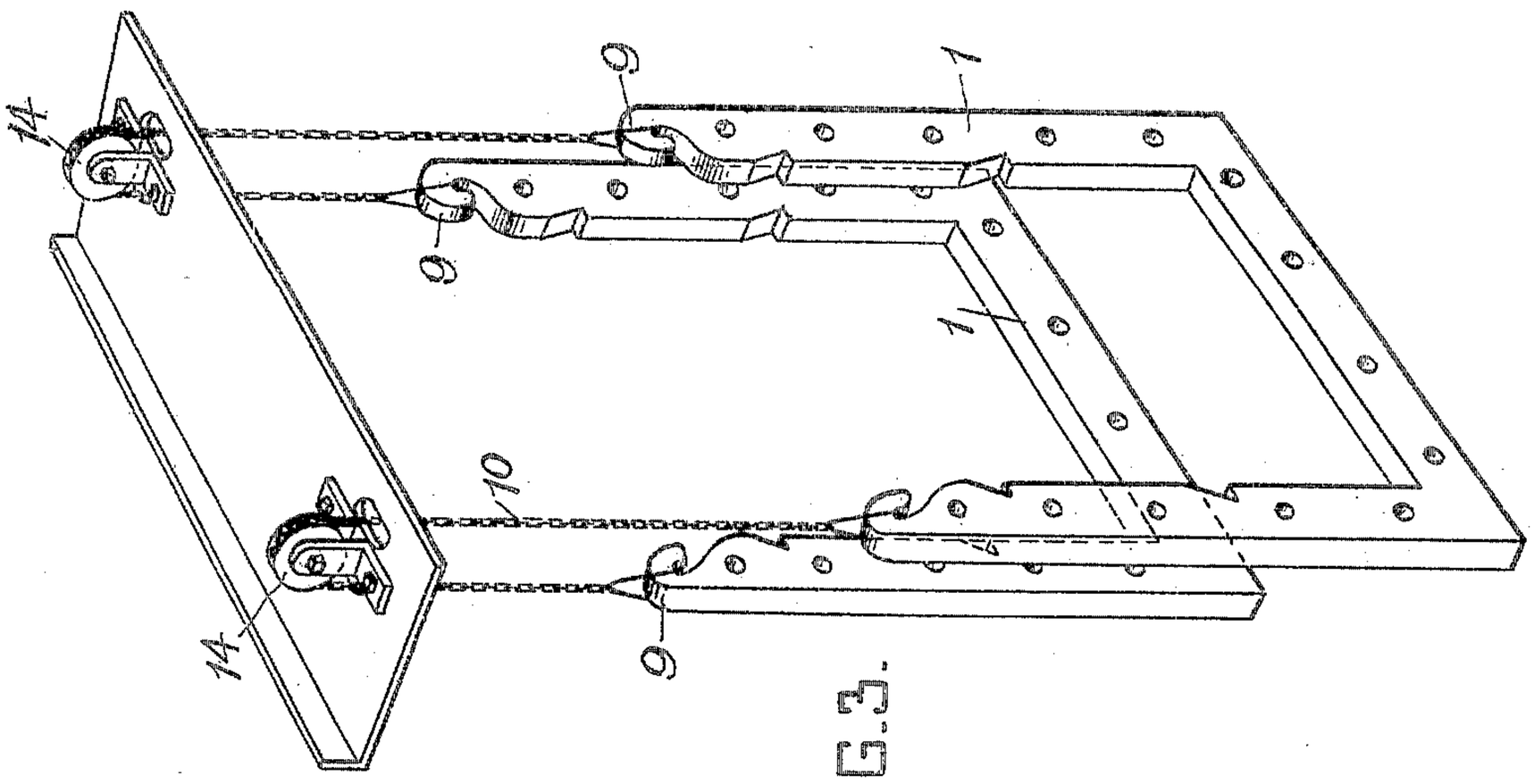

FIG. 3.

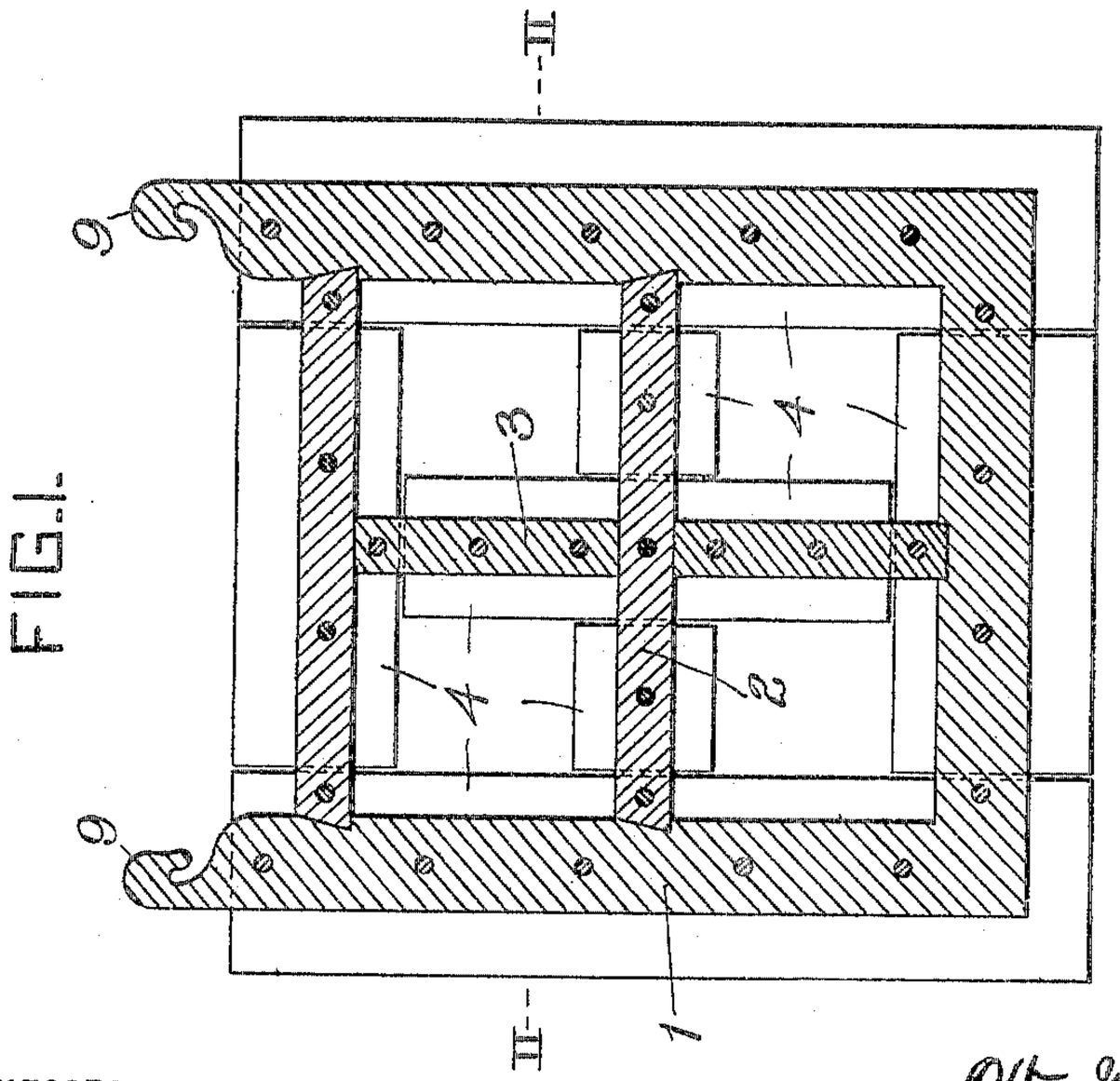

FIG. 1.

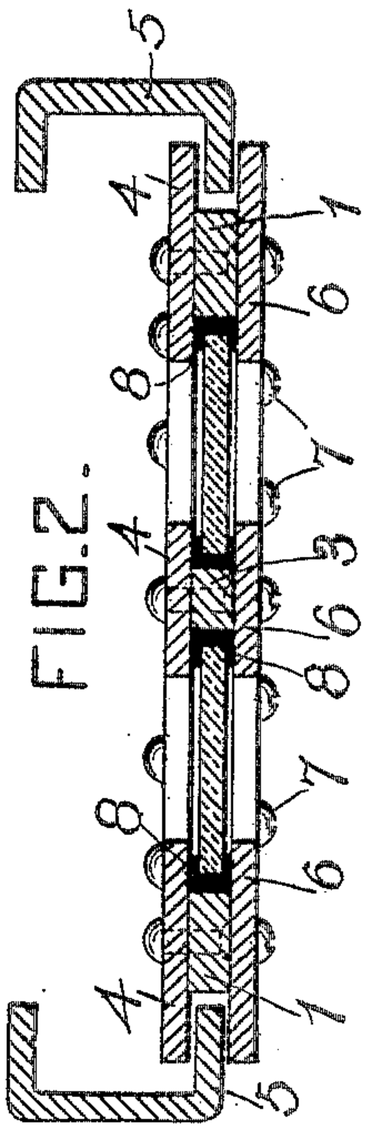

FIG. 2.

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2 SHEETS—SHEET 2.

FIG. 4.

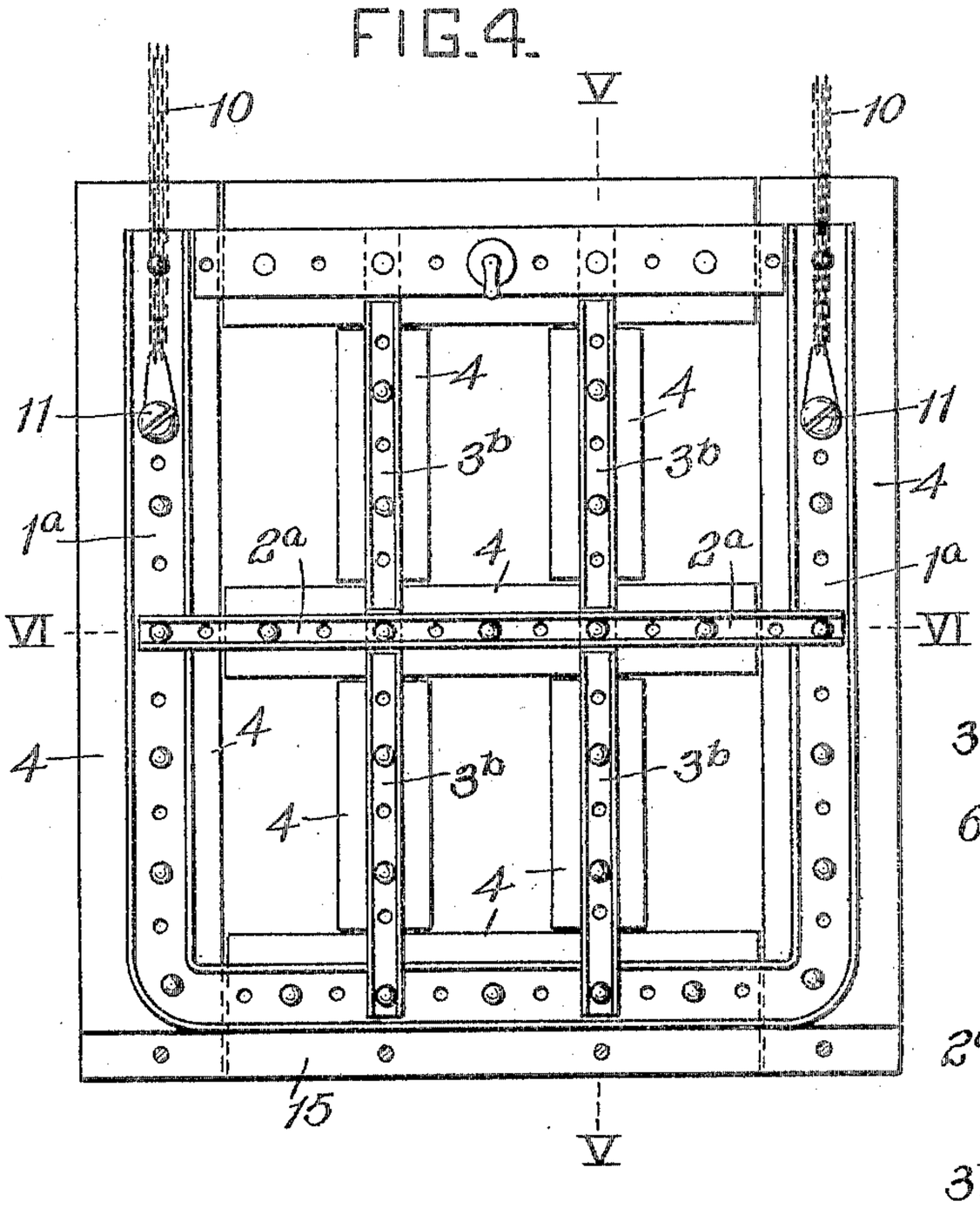
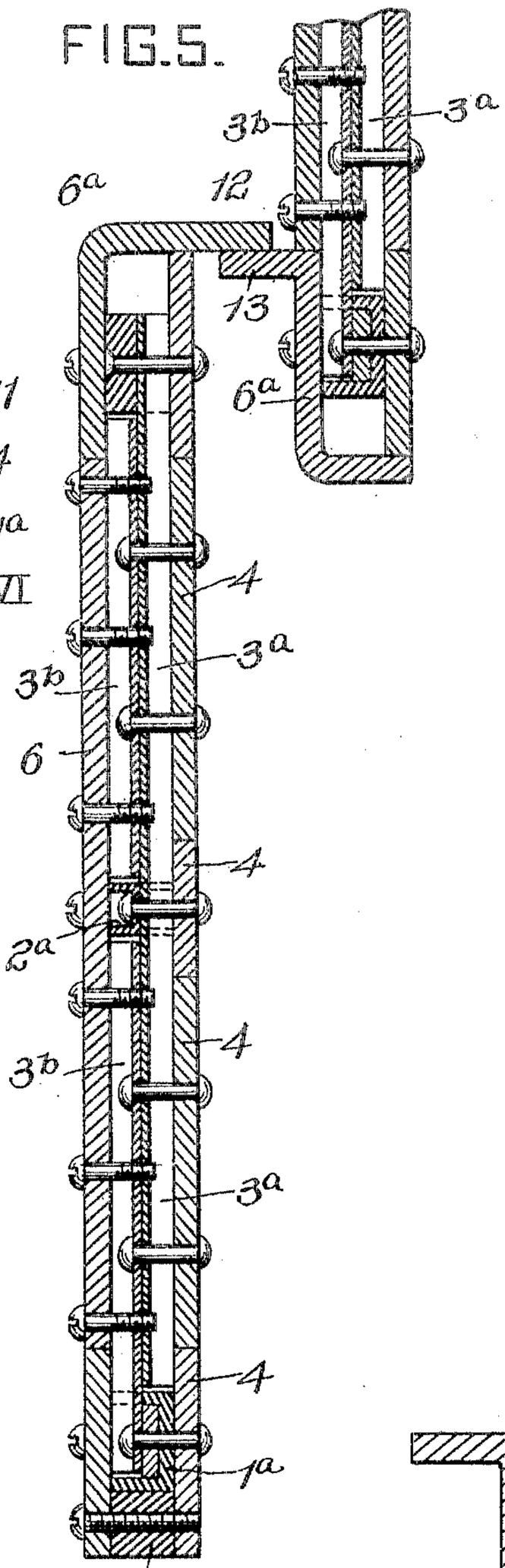


FIG. 5.



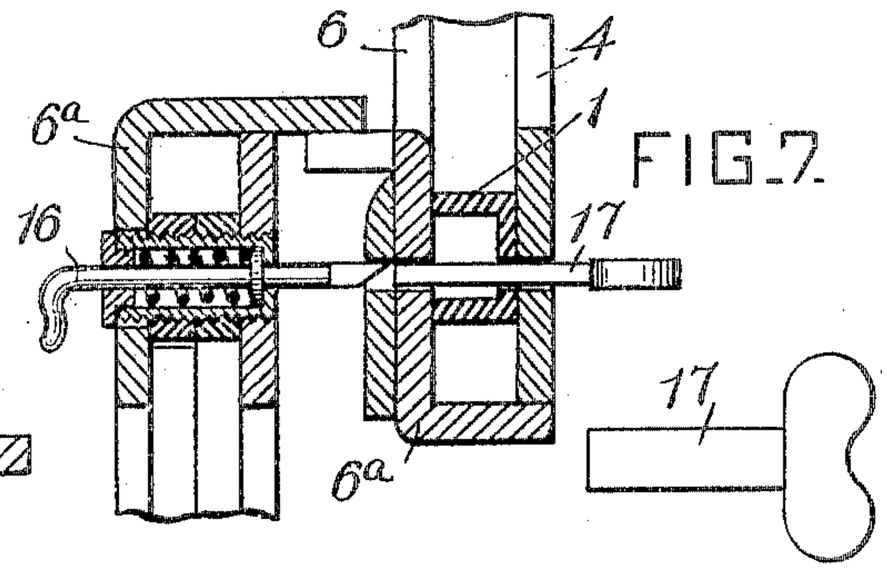


FIG. 7.

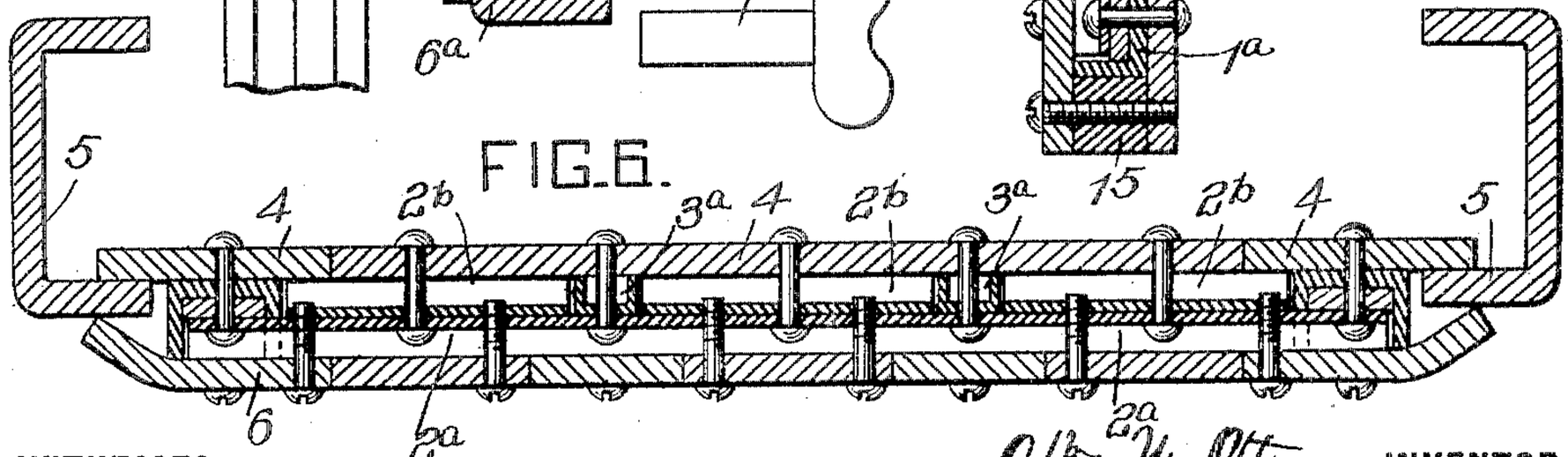


FIG. 6.

WITNESSES:
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UNITED STATES PATENT OFFICE.

OTHO M. OTTE, OF PITTSBURG, PENNSYLVANIA.

WINDOW-SASH.

No. 797,147. Specification of Letters Patent. Patented Aug. 15, 1905.

Application filed December 3, 1904. Serial No. 235,396.

To all whom it may concern:

Be it known that I, OTHO M. OTTE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Window-Sashes, of which improvements the following is a specification.

In an application for Letters Patent filed September 3, 1904, Serial No. 223,229, I have described and shown certain improvements in windows, such improvements consisting, generally stated, in providing guides for the sashes secured to or in the walls forming the sides of the window-openings, or, in other words, avoiding the use of frames for the sashes.

The invention described herein relates to further improvements in that class or kind of windows; and it consists more particularly in certain structural features of the sash proper. The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of my improved sash, the front or removable glazing-strips being removed. Fig. 2 is a sectional view on a plane indicated by the line II II, Fig. 1. Fig. 3 is a perspective view of the sash-frames or skeletons, showing the manner of connecting them to each other. Fig. 4 is a view similar to Fig 1, illustrating a modification in the construction of the sash. Figs. 5 and 6 are sectional views on planes indicated by the lines V V and VI VI, Fig. 4; and Fig. 7 is a detail view illustrating the means for locking the sashes in closed position.

In the practice of my invention the skeleton or frame 1 of the sash is made continuous at least from one point of attachment of the supporting-rope around to the other point of attachment of the other rope. In other words, the skeleton or frame is made U-shaped, as clearly shown in Figs. 1 and 3. The cross-bars 2 are preferably so attached to the vertical portions of the skeleton or frame, as by mortising the ends of the cross-bars into the sides of the frame, that such sides will carry the bars and support the glass resting thereon. The muntins 3 may be made in sections of a length equal to the distance between the adjacent cross-bars or be made continuous, in which case the muntins and cross-bars where they cross each other are notched, respectively, for a distance equal to half the thickness of each, so that the muntins and cross-bars will be in the same plane. On one side of the sash glazing-strips 4 are secured, preferably by rivets passing through such strips and the frame and cross-bars and muntins. As clearly shown in Figs. 1 and 2, these glazing-strips 4 are made of a width so that they will project beyond the parts to which they are attached, on both sides thereof, so that the edges of such glazing-strips will not only overlap the pieces of glass placed in the sash, but also, especially as regards the glazing-strips on the sides of the skeleton or frame, where they form one wall of grooves for the reception of sash-guiding plates 5, which, as described in the application filed September 3, 1904, are built in or firmly secured to the side walls of the window-opening. The glass is held in position in the sash by removable glazing-strips 6, which are detachably secured to the frame or skeleton, the cross-bars, and the muntins by means of screws 7, as shown. In order to prevent the glass rattling in the frame, packing-strips 8 of any suitable material, as lead, are arranged along the edges of the glass, as clearly shown in Fig. 2. By reference to Fig. 2 it will be seen that the glazing-strips 6, secured to the sides of the U-frame or skeleton, project beyond the latter and parallel with the corresponding fixed strips 4, forming therewith grooves for the reception of the guiding-plates 5. The ends of the U-frame or skeleton may be formed with hooks 9 for attachment of the ends of supporting-rope 10, or the ends of such rope may be secured to pins 11, engaging the U-frame or skeleton, as shown in Fig. 4. This construction of sash I term for convenience a "three-piece sash," one piece or part consisting of the frame, the cross-bars, and muntins and the other parts or members formed by the glazing-strips 4 and 6.

In lieu of forming the frame, cross-bars, and muntins of the sash of plain bars, as shown in Figs. 1 to 3, they may be formed of channel-bars, as shown in Figs. 4, 5 and 6. In this construction the U-frame or skeleton 1^a is made of a heavier section of channel-bar

than the cross-bars and muntins and is bent to the desired shape, as shown in Fig. 4. Each of the cross-bars and muntins is formed of two channel-bars of smaller section, placed back to back. One of the channel-bars 3^a of the muntins is continuous from the upper cross-bar down to the horizontal member of the U-frame, as clearly shown in Fig. 5, and one of the channel-bars, as 2^a, of the cross-bars is continuous from side to side of the U-frame, as shown in Fig. 6. The ends of such cross-bars overlap the sides of the U-frame, one of the flanges of the latter being notched for the reception of the end of the member 2^a. The channel-bar 3^b, forming the other member of the muntins is made in sections which extend from cross-bar to cross-bar, their ends resting or bearing against the latter, as shown in Fig. 5. Similarly, the other member 2^b of each of the cross-bars is made in sections extending from vertical member to vertical member of the sash. These sections are riveted to the continuous members of the muntins and cross-bars. By this construction the cross-bars and muntins, while made double or of two channel-bars, will lie in the same plane and have a thickness equal to the thickness forming the channel-bar of the U-frame or skeleton. The lower channel-bar sections forming part of the muntins overlap the horizontal member of the U-frame. One whose flanges are cut away for this purpose is clearly shown in Fig. 4. The permanent or fixed glazing-strips 4 are secured to one side of the sash-frame thus formed and the removable strips are secured to the opposite side of the frame by means of screws, as shown in Fig. 6. It is preferred that the projecting edges of one or both of the glazing-strips projecting beyond the sides of the U-frame should be bent inwardly, so that the guiding-strip or plate 5 will be gripped by these glazing-strips in such manner as to form a weatherproof joint between the sash and guiding-plates, but without sufficient friction to prevent the movements of the sashes, as shown in Fig. 6. In order to form a weatherproof joint between the upper and lower sashes, the upper glazing-strip 6^a of the lower sash is bent over horizontally, so that a portion 12 thereof will project beyond the plane of the sash, forming a meeting-rail, as shown in Fig. 5. The glazing-strip 6^a of the upper sash has a portion 13 similarly bent to form the other meeting-rail, and the lower edge of such strip is also bent, by preference, so as to form a good finish to the lower end of the upper sash.

It is preferred that the fixed glazing-strips extending horizontally across the sash should be made continuous, while the corresponding removable strips are made in sections. The fixed vertical glazing-strips 4, which are secured to the muntins, are preferably made in sections, and the corresponding removable strips 6 are made continuous, as shown in Figs. 4 and 5.

The sashes are connected by ropes or chains 10, passing over pulleys 14, so that the sashes will move in unison, but in opposite directions. The lower sash is made heavier than the upper sash, so that when free to move said sashes will automatically slide to closed position. The increased weight of the lower sash may be obtained by making the members—*i. e.*, frame cross-bars, muntins, and glazing-strips—some or all of a heavier gage of material, or weights 15 may be secured between the downwardly-projecting portions of the glazing-strips 5 and 6, secured to the horizontal or end member of the U-frame. In order to lock the sashes in closed position, a spring-actuated locking-pin 16 is so arranged in the lower sash as to engage an opening in the lower sash. As in case of fire it is desirable to open the windows from the outside, the opening in the upper sash for the reception of the locking-pin is extended through the frame, so that a key 17 may be inserted to displace the locking-pin.

In the application referred to the guides for the sashes were formed of independent plates embedded in the side walls of the window-opening. In lieu of such construction the plates may be formed integral with each other by bending a plate of suitable width to U shape or by using channel-bars of suitable dimensions.

I claim herein as my invention—

1. A window-sash having in combination a U-shaped frame or skeleton, cross-bars, muntins arranged in said frame, and glazing-strips, substantially as set forth.

2. A window-sash having in combination a U-shaped frame or skeleton cross-bars and muntins and glazing-strips, the strips secured to the frame extending beyond the sides of the latter to form guide-grooves, substantially as set forth.

3. A window-sash having in combination a U-shaped frame or skeleton cross-bars and muntins interlocked at their intersections and glazing-strips, substantially as set forth.

4. A window-sash having in combination a metal frame cross-bars, muntins and glazing-strips, the glazing-strip at one end of the sash being bent to form a meeting-rail, substantially as set forth.

5. A window-sash having in combination a frame or skeleton cross-bars and muntins, said parts being formed of channel-bars, substantially as set forth.

6. A window-sash having in combination a frame formed of a channel-bar, and cross-bars and muntins formed of two channel-bars arranged back to back, substantially as set forth.

7. A window-sash having in combination a frame formed of a channel-bar, and cross-bars and muntins each formed of a continuous and two or more sections of channel-bars, the continuous and sectional bars being arranged back to back, substantially as set forth.

In testimony whereof I have hereuto set my hand.

OTHO M. OTTE.

Witnesses:
CHARLES BARNETT,
FRED H. KIRCHNER.