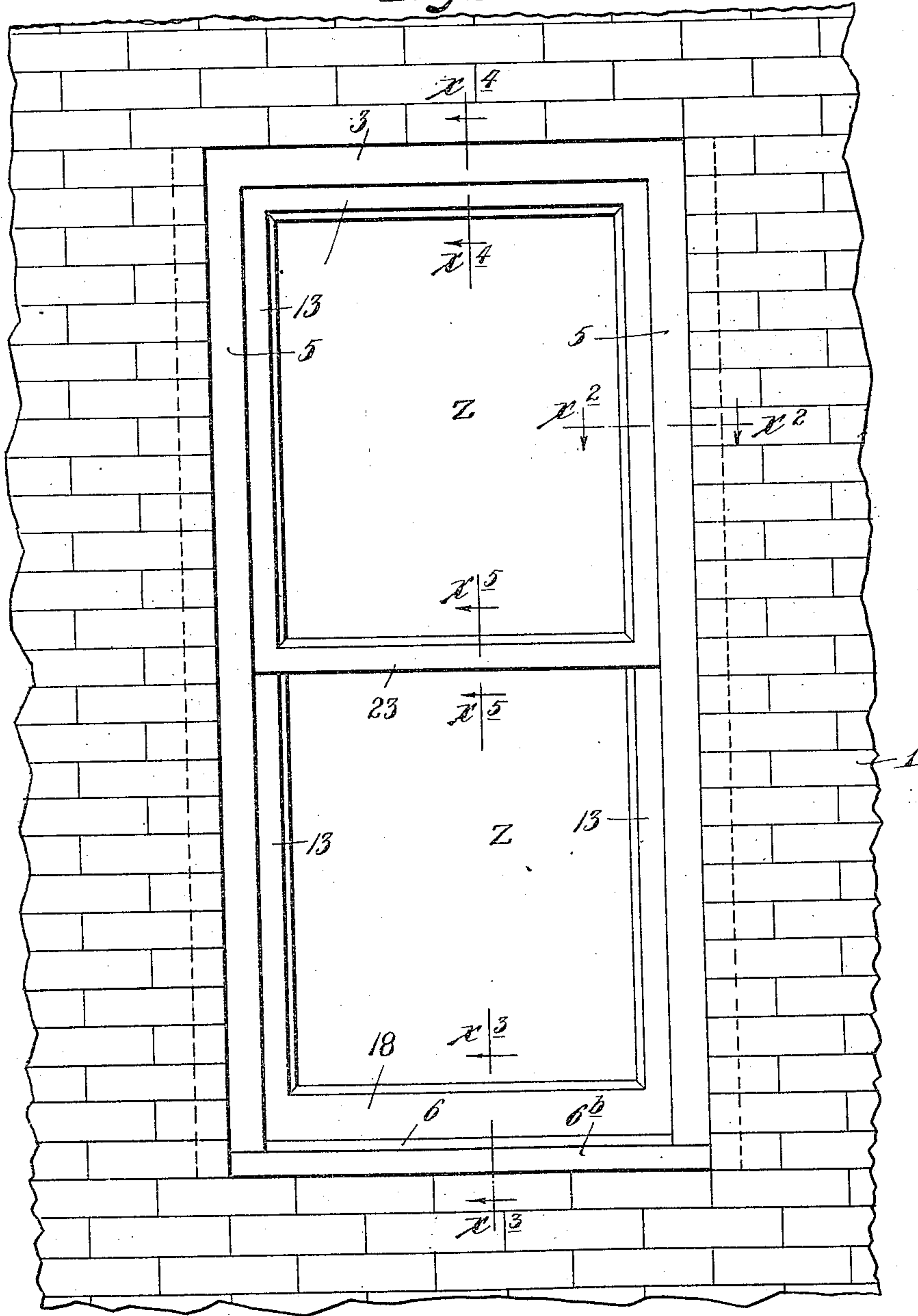


J. TYRA.
METALLIC WINDOW SASH AND FRAME.

APPLICATION FILED AUG. 14, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

E. W. Jeppesen.

A. H. Opahl.

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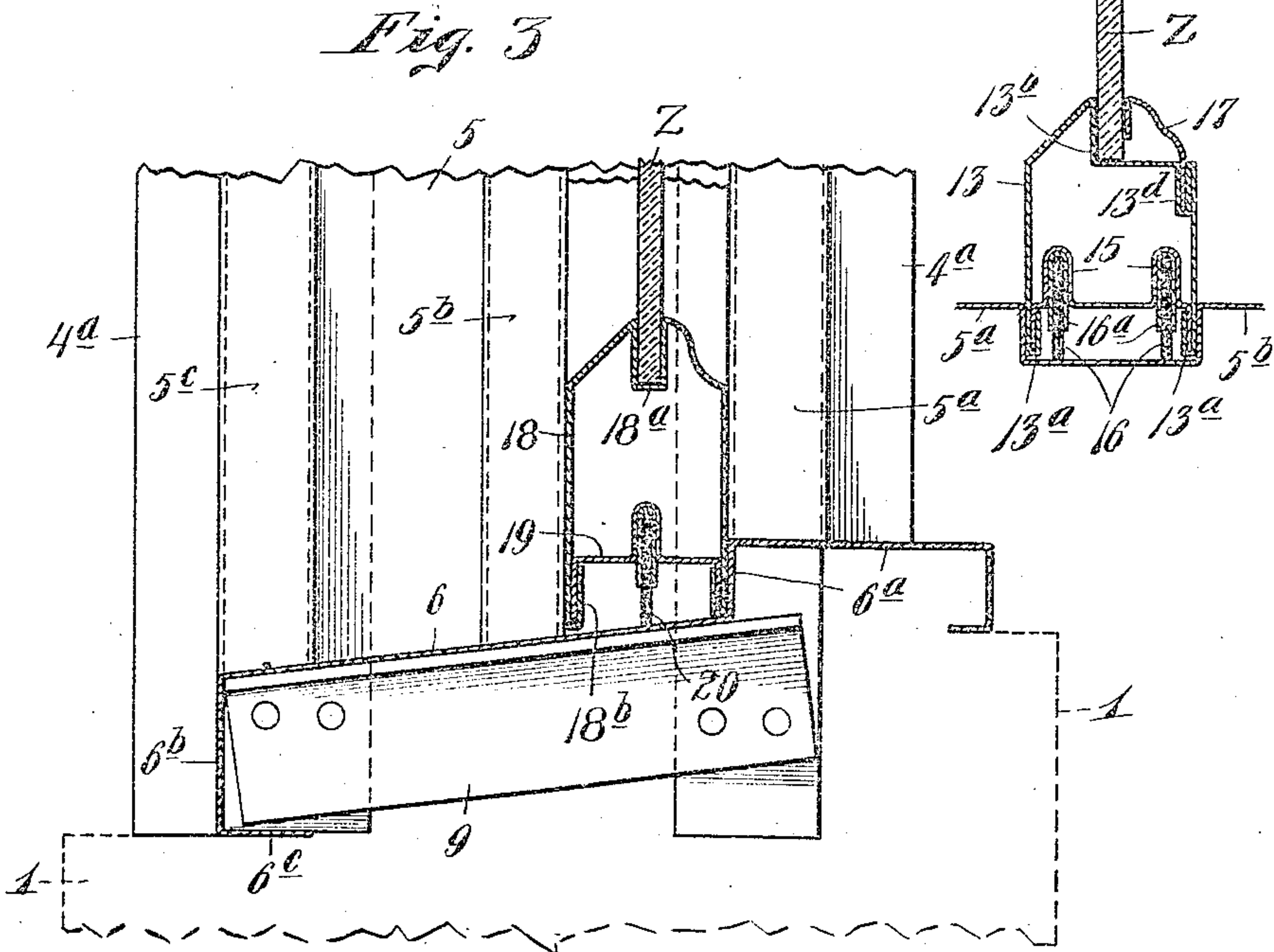
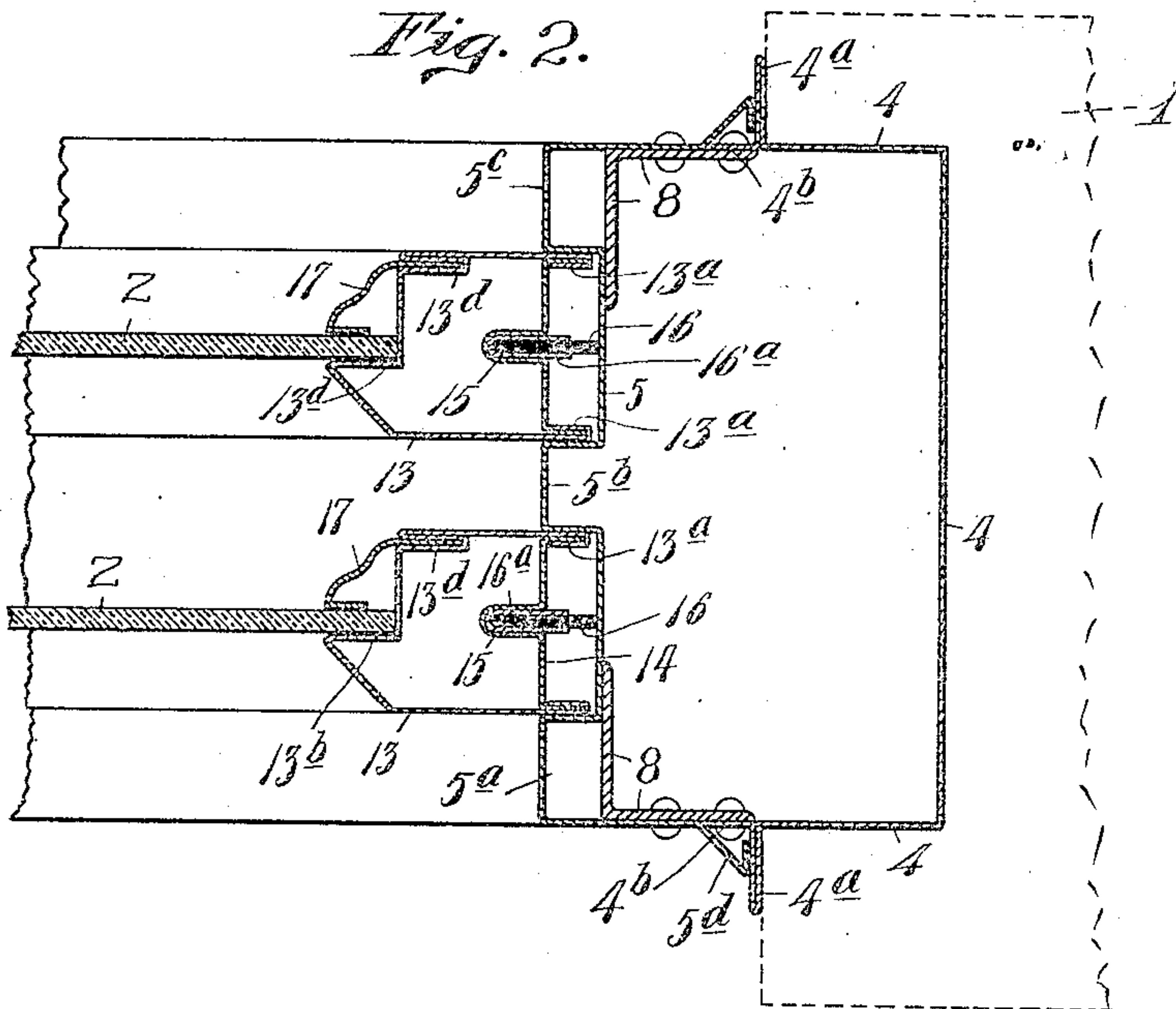
By his Attorneys.

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APPLICATION FILED AUG. 14, 1905.

3 SHEETS—SHEET 2.



Witnesses.

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No. 816,690.

PATENTED APR. 3, 1906.

J. TYRA.
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APPLICATION FILED AUG. 14, 1905.

3 SHEETS—SHEET 3.

Fig. 4.

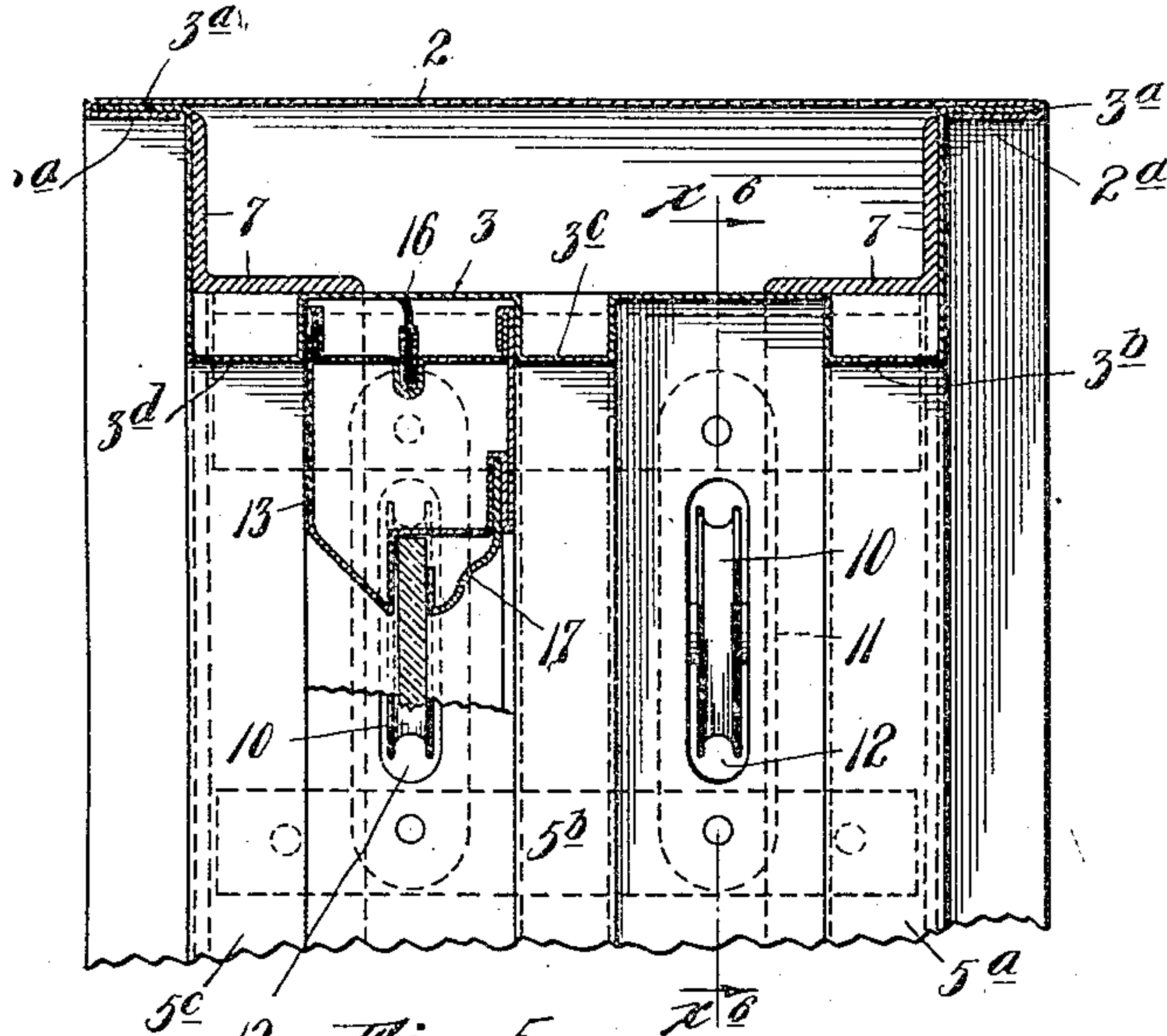


Fig. 6.

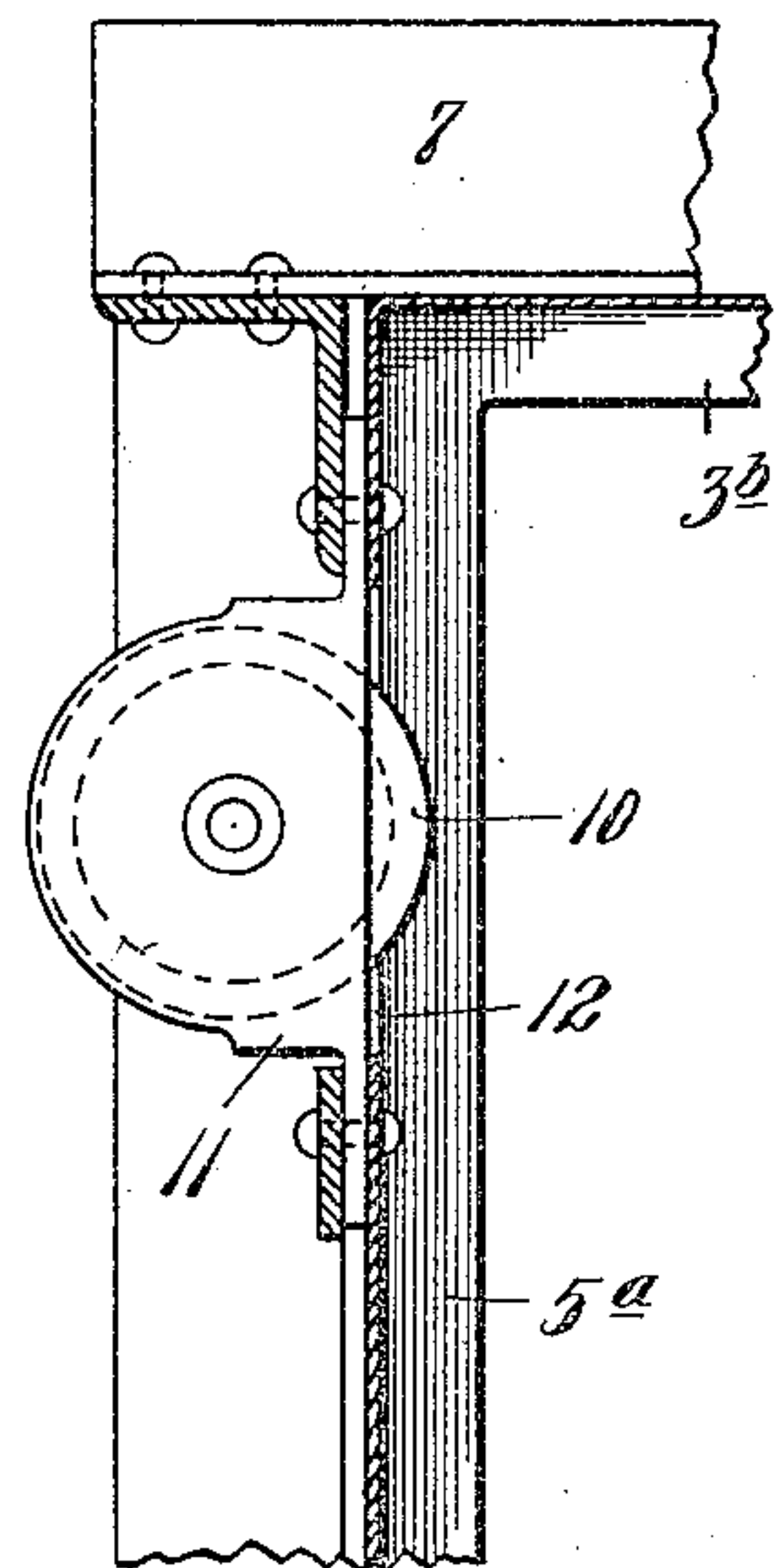


Fig. 5.

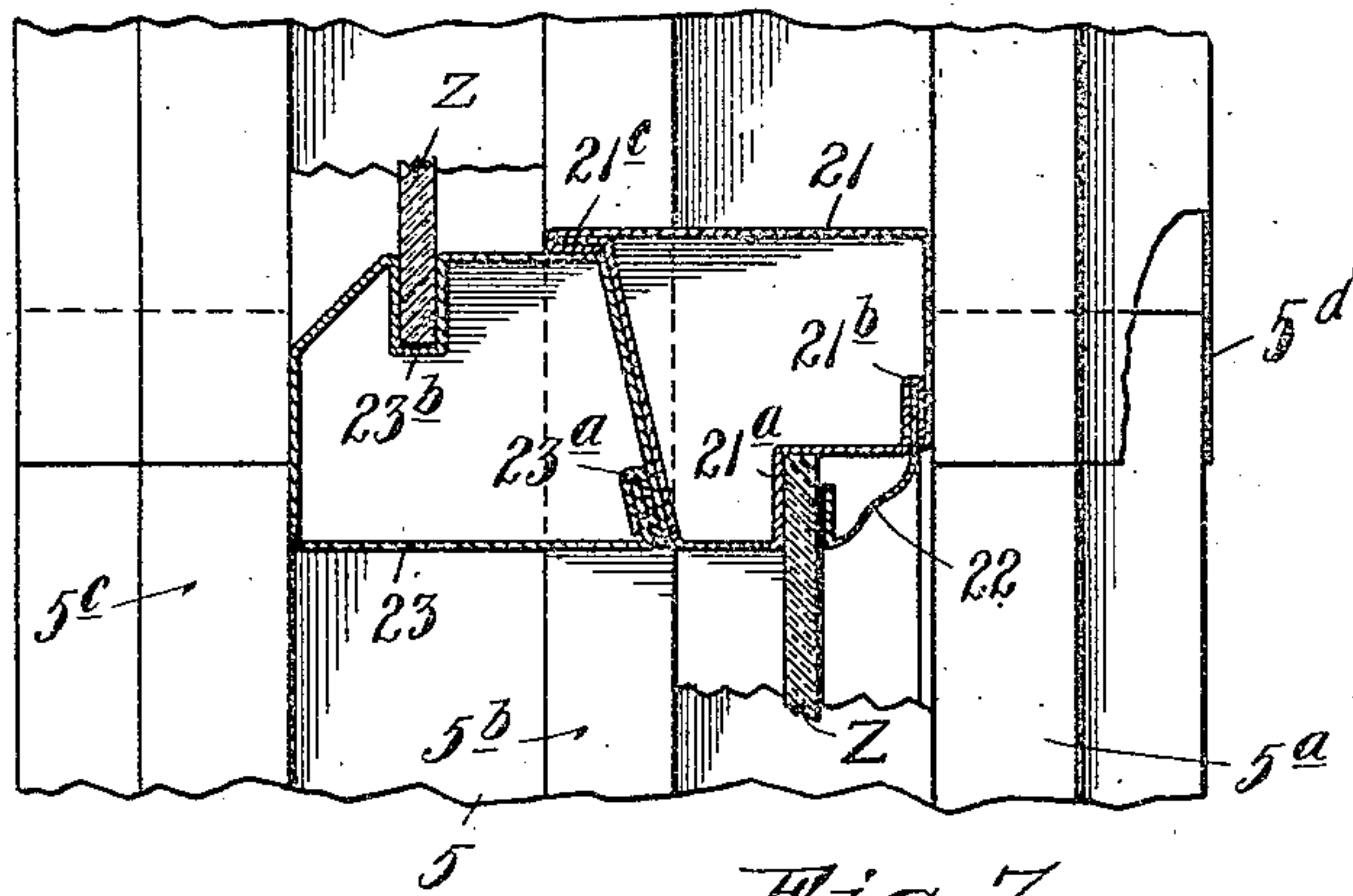


Fig. 8.

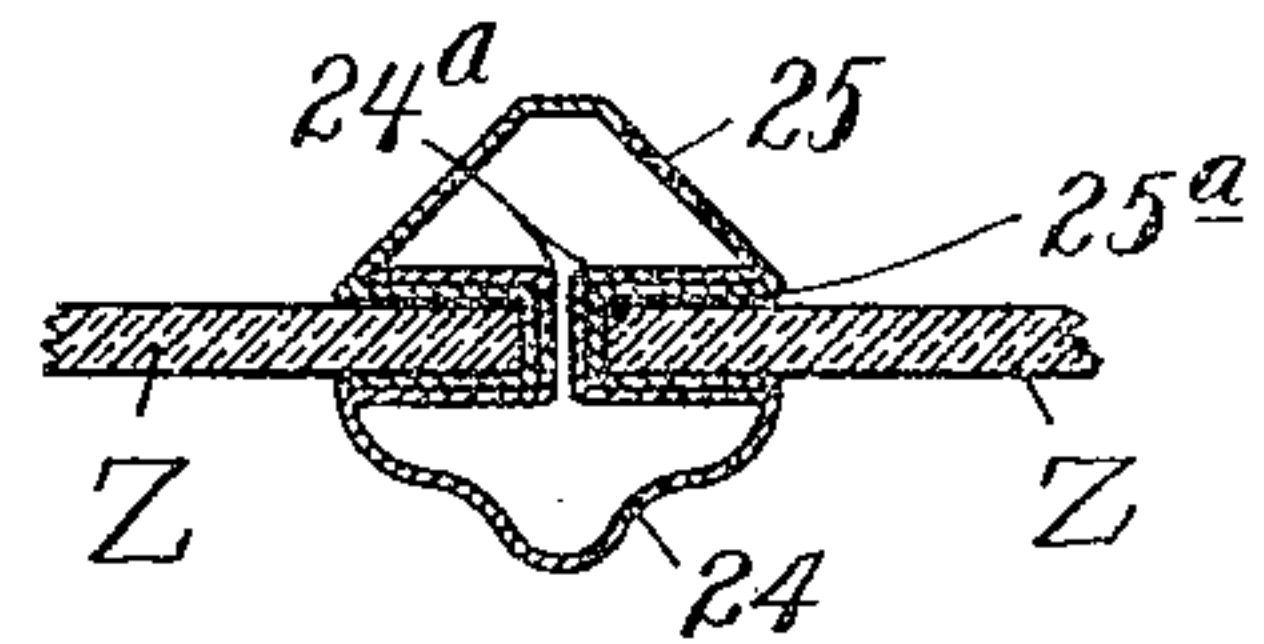
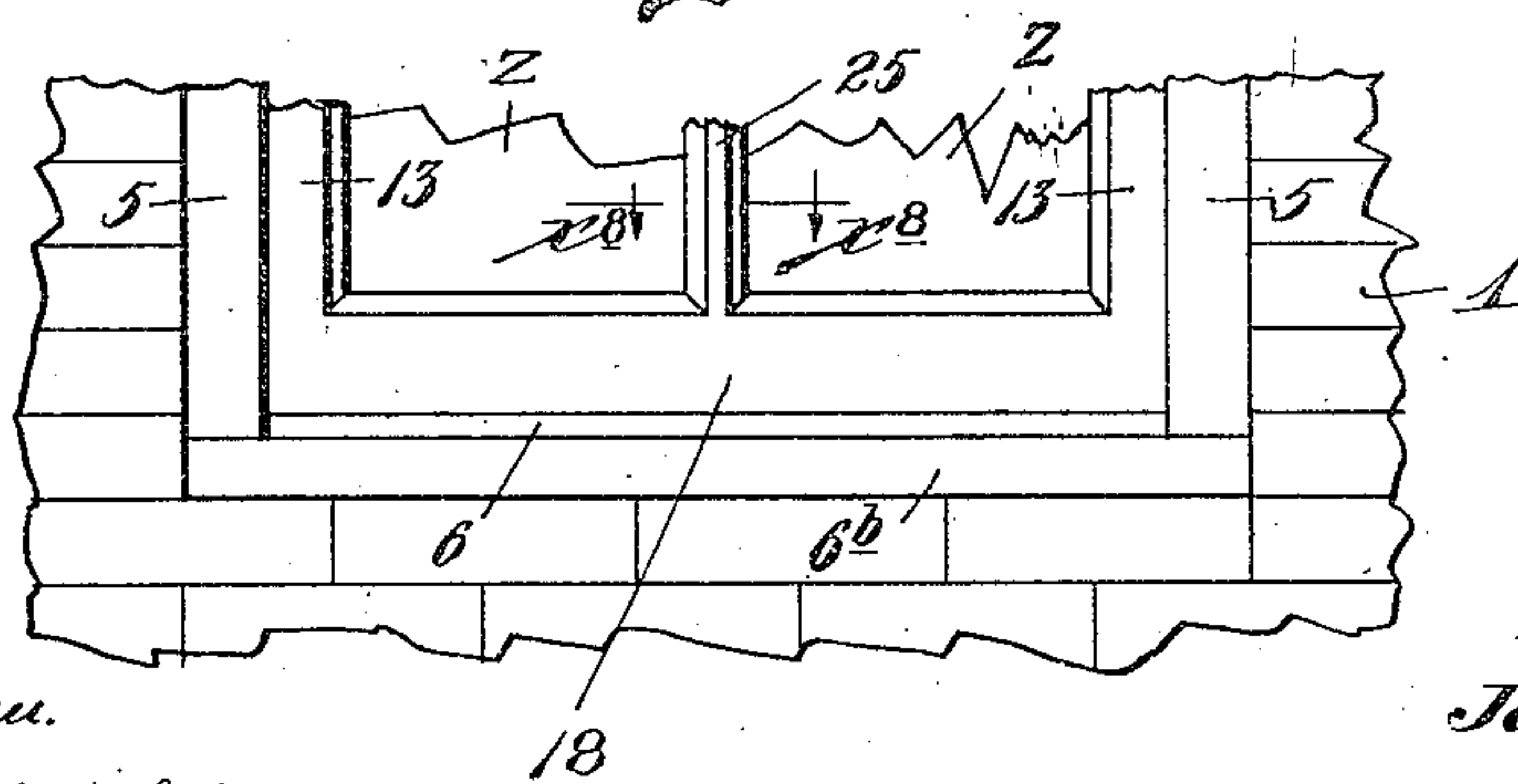


Fig. 7.



Witnesses.

E. W. Jeppum.

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Williamson M. M. M.

UNITED STATES PATENT OFFICE.

JOSEPH TYRA, OF MINNEAPOLIS, MINNESOTA.

METALLIC WINDOW SASH AND FRAME.

No. 816,671.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed August 14, 1905. Serial No. 274,035.

To all whom it may concern:

Be it known that I, JOSEPH TYRA, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Metallic Window Sash and Frames; 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 metallic window frames and sashes, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

In the accompanying drawings, which illustrate my invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in elevation, showing a portion of one of the walls of a building and illustrating my invention applied to one of the windows thereof. Fig. 2 is a horizontal section taken on the line $x^2 x^2$ of Fig. 1, some parts being broken away and some being shown by dotted lines only. Fig. 3 is a vertical section taken on the line $x^3 x^3$ of Fig. 1, some parts being broken away and some parts being shown by dotted lines only. Fig. 4 is a vertical section taken on the line $x^4 x^4$ of Fig. 4, some parts being broken away. Fig. 5 is a vertical section taken on the line $x^5 x^5$ of Fig. 1, some parts being broken away. Fig. 6 is a vertical section taken on the line $x^6 x^6$ of Fig. 4, some parts being broken away. Fig. 7 is a view in elevation, some parts being broken away, illustrating a window-sash having a vertical intermediate bar. Fig. 8 is a section on the line $x^8 x^8$ of Fig. 7, some parts being broken away; and Fig. 9 is a detail taken on the same line as Fig. 2, but illustrating a slightly-modified construction.

The numeral 1 indicates the wall of a building having a window-opening in which the improved window frame and sash are applied. The top of the window-frame is made up chiefly of vertically-spaced plates 2 and 3. The sides of said frames are made up chiefly of laterally-spaced plates 4 and 5, and the bottom or sill forming portion of said frames is made up chiefly of a plate 6, all of which

plates are constructed of sheet metal bent to the proper form, which is hereinafter more fully described. The top-forming plates 2 and 3 are united by outturned flanges 3^a on said plate 3, which engage channels formed by inturned flanges 2^a of said plate 2, as best shown in Fig. 4. The plate 3 is bent to form an inner stop 3^b , an intermediate stop 3^c , and an outer stop 3^d , between which stops seats for the upper edges of the upper and lower sash are formed. Longitudinally-extended angle-irons 7 are secured by rivets, solder, or other means in the angle formed between the body and upturned portions of the plate 3. (See Fig. 4.) The side-forming plates 4 fit in the grooves formed in the wall 1, (see Fig. 2,) and at points which are outward of the said wall they are folded upon themselves at 4^a to form joint-strips with the wall and edges outward of said folders 4^a , that are extended at 4^b in line with the side of said channel-strips 4. These flanges 4^a are riveted or otherwise rigidly secured to the overlapped flanges of the vertically-extended angle-iron sections 8. The plates 5 are bent to form inner stops 5^a , intermediate stops 5^b , and outer stops 5^c , between which stops channels are formed in which the sash move vertically. The edges of the plates 5 are bent at 5^d to form moldings or the equivalent thereof, that closely engage with the flange 4^a of the plates 4. The sill-forming plate 6 is inclined outward and in line with the outer edges of the inner stops 5^a is bent upward, then inward, and then downward, as best shown at 6^a in Fig. 3. The outer edge of the plate 6 is turned downward at 6^b and then inward at 6^c to form the outer portion of the sill. The lower ends of the vertical irons 8 are rigidly connected by short angle-iron sections 9, that also serve as supports for the sill-forming plates 6.

The cord-pulleys 10, which are mounted on the usual bearing-brackets 11 and work through openings 12, formed in the upper portions of the plates 5 in line with the upper and lower sash, are presently to be described. The pulley-boxes 11 are riveted or otherwise secured to these said plates 5, preferably as shown in Fig. 6. The said plates 5 are preferably made up of two sections that overlap the central portion of the window-frame, as best shown in Fig. 5 at 5^d , so that when the lower sections of said plates are loosened and raised

access may be had to the weights, (not shown,) but which will of course be mounted in the vertical boxes formed by the plates 4 and 5.

5 The upper and lower sash are in construction very much alike. The vertical sides of the upper and lower sash are, as shown, of the same construction, each being made up of a sheet-metal plate 13, which is bent in the
10 form of a channel, the parallel webs of the channel being turned inward at 13^a to form vertically-extended pockets that receive the outturned edges of filling-plates 14. These filling-plates 14 at their intermediate por-
15 tions are bent upon themselves to form vertically-extended channels or grooves 15, that receive and tightly hold weather-strips 16. The weather-strips 16 may be constructed of leather or similar slightly pliable material,
20 and they may be directly secured in the brackets or in the grooves 15 or may be secured in channel-like stiffening-strips 16^a, which in turn directly engage the said grooves 15. The intermediate portions of the chan-
25 nel-plates 13 are bent at 13^b to form vertical stop-ribs against which the outer surface of the pane of glass (indicated by the character z) is pressed. The inner surface of the
30 pane of glass is directly pressed by inturned portions of metallic detachable clamping-strips 17, which strips are formed of sheet metal bent approximately in the form shown in Fig. 2, and the outer edges of which engage
35 in the vertical pockets 13^a, formed by bending the strips 13 upon themselves, as best shown in Fig. 2. The clamping-strips 17 may be rigidly secured in said pockets 13 by solder or rivets, or they may be held simply
40 by friction. It will of course be understood that the parts 13, 14, 16, and 17 all move together as an entirety when the sash is raised and lowered.

The bottom of the lower sash (see Fig. 3) is made up of a body-plate 18 and a filling-
45 plate 19, the former of which is bent in the form of a channel and is formed in its upper portion with a press-groove 18^a, that receives the lower portion of the pane z. These plates 18 and 19 are preferably connected in
50 the same manner as the plates 13 and 14 before described—that is, the downturned edges of the filling-plate 19 fit in pockets 18^b, formed by the inwardly and upwardly turned edges of the parallel sides of the plate 18.
55 Also a pliable weather-strip 20 is seated in a groove or pocket formed within the intermediate portion of said plate 19, as before described. The top bar of the lower sash (see
60 Fig. 5) is preferably formed by a single plate 21, which is bent to form a hollow bar. More specifically stated, said plate 21 is bent at 21^a to form shoulders against which the outer sur-
65 faces of the pane z are pressed, and the inner surfaces of said pane are pressed by a removable strip 22, similar to the heretofore de-

scribed strips 17, and the upper edge of which strip 22 engages in a pocket 21^a, formed by bending the plate 21 upon itself. At the upper and outer portion of the bar the edges of the plate 21 are united by an interlapping joint
70 21^c, that forms an outward-projecting flange. The lower bar of the upper and outer sash is also preferably formed by a single metallic plate 23, which is bent upon itself to form a hollow bar, the edges thereof being connected
75 at the lower and inner portion of said bar by a lapped joint 23^a. The upper portion of said plate 23 is bent at 23^b to form a groove which receives the lower edge of the pane z. It will be noted that the two bars formed by the
80 plates 21 and 23 closely engage each other on an incline and that the flange 21^c of the former overlaps the latter, thereby forming a very close joint. The top bar of said outer and upper sash is made up of a sheet-metal
85 body-plate and a filling-plate which is of the same construction as the side bars of the sash, and the bars are therefore indicated by the same characters—to wit, by the numerals 13, 14, 16, and 17 and associated letters.
90 (See Fig. 4.)

The construction illustrated in Fig. 9 is the same as that illustrated in Fig. 2, except that two weather-strips 16 are employed instead of one. The construction illustrated in Figs.
95 7 and 8 is the same as that already described, except that the sash is provided with a vertical intermediate bar made up of plates 24 and 25. The plate 24 is bent to form a hollow bar, and its edges are given a U-shaped bend
100 at 24^a. The plate 25 is also bent to form a hollow bar, and its edges are given a U-shaped bend at 25^a, that will cause it to fit closely within the U-shaped bends of the bar 24. The bent U-shaped portions 25^a directly re-
105 ceive the edges of the two panes z. The strips or bars formed by the plates 24 and 25 are adapted to be put together by endwise-sliding movements. It will of course be understood that several component bars of the
110 sash are adapted to be secured together at their open ends and edges by solder or rivets or by any other suitable means.

What I claim, and desire to secure by Letters Patent of the United States, is as fol-
115 lows:

1. In a metallic window-sash, the combination with sheet-metal plates 13 bent into channel form, of filling-plates 14 secured to and between the outturned parallel sides of
120 said plates 13, and weather-strips made up of the channel-shaped holders 16^a and pliable blades 16 secured together, said weather-strips 16^a 16 being detachably seated in the channels 15 formed in the intermediate por-
125 tion of said filling-plates 14, substantially as described.

2. In combination, upper and lower window-sash made up of sheet-metal plates bent to form hollow bars, the upper bar of the
130

lower sash and the lower bar of the upper sash having surfaces that engage obliquely, and the former having a projecting rib that overlaps the latter, substantially as described.

3. In combination, upper and lower window-sash made up of sheet-metal plates bent to form hollow bars, the top bar of the lower sash being made up of the plate 21 bent to form the shoulder 21^a, fold 21^b and projecting flange 21^c, and a joint-strip 22 fitting in said fold 21^b and cooperating with the said shoulder 21^a to hold the upper edge of the glass, substantially as described.

4. In a metallic window-sash, an intermediate bar made up of plates 24 and 25 formed respectively with U-shaped folds 24^a and 25^a,

said parts being telescoped together, substantially as described.

5. A metallic window-frame, the sides thereof being made up of sheet-metal plates bent to form the sash-stops and sash-guiding channels, each of the said stop-forming plates being made up of a plurality of overlapped sections, the lower of which when raised affords access to the space containing the window-weights, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH TYRA.

Witnesses:

MALIE HOEL,

F. D. MERCHANT.