

No. 754,437.

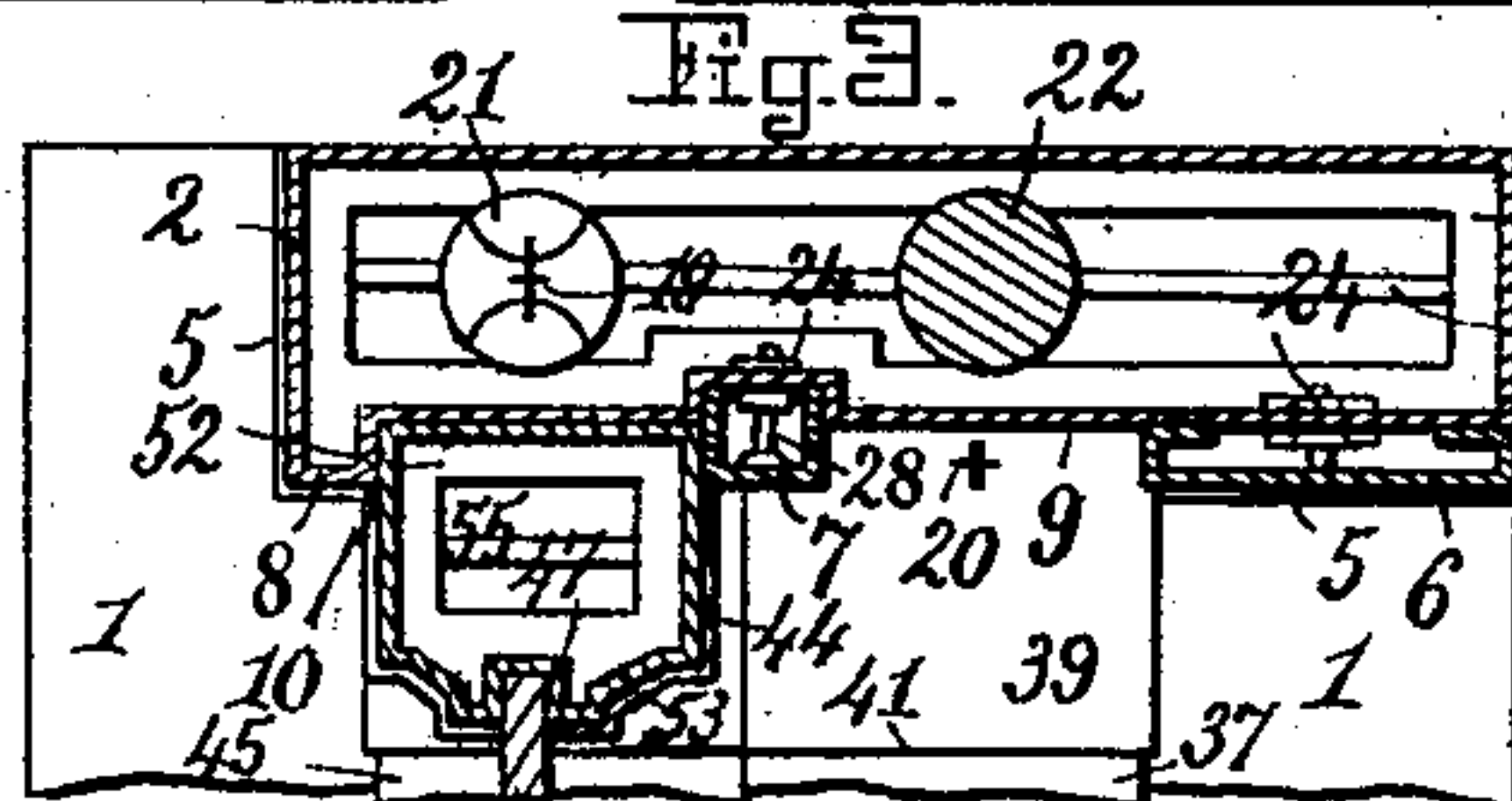
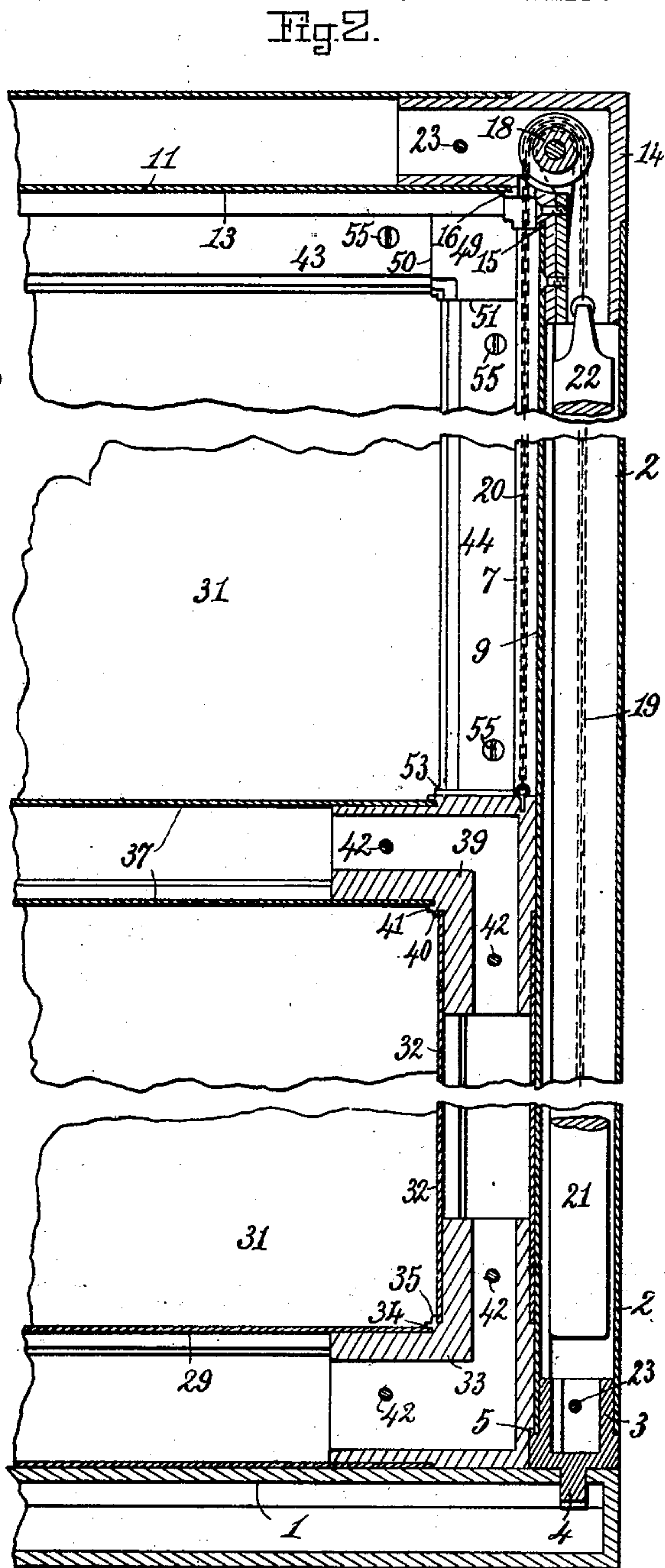
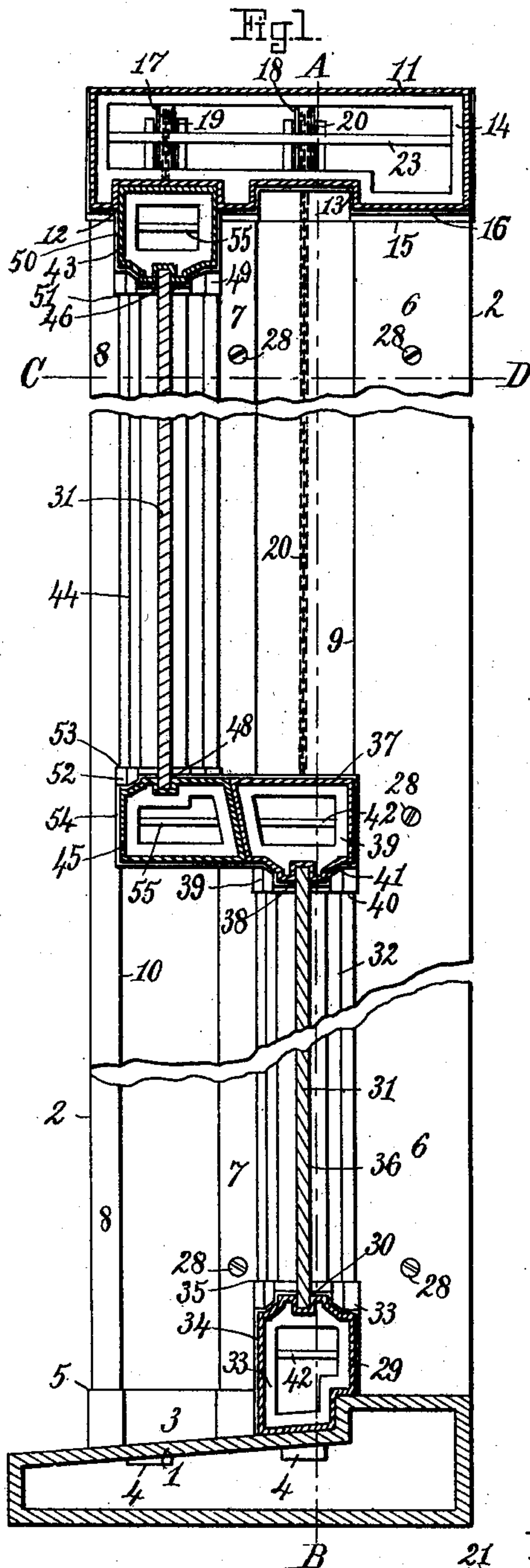
PATENTED MAR. 15, 1904.

I. W. EMERSON.
FIREPROOF WINDOW FRAME AND SASH.

APPLICATION FILED APR. 1, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses

Geo. J. Chadborn.
Laird N. Miller

Inventor

Isaiah W. Emerson
by
Henry Chadborn
his atty.

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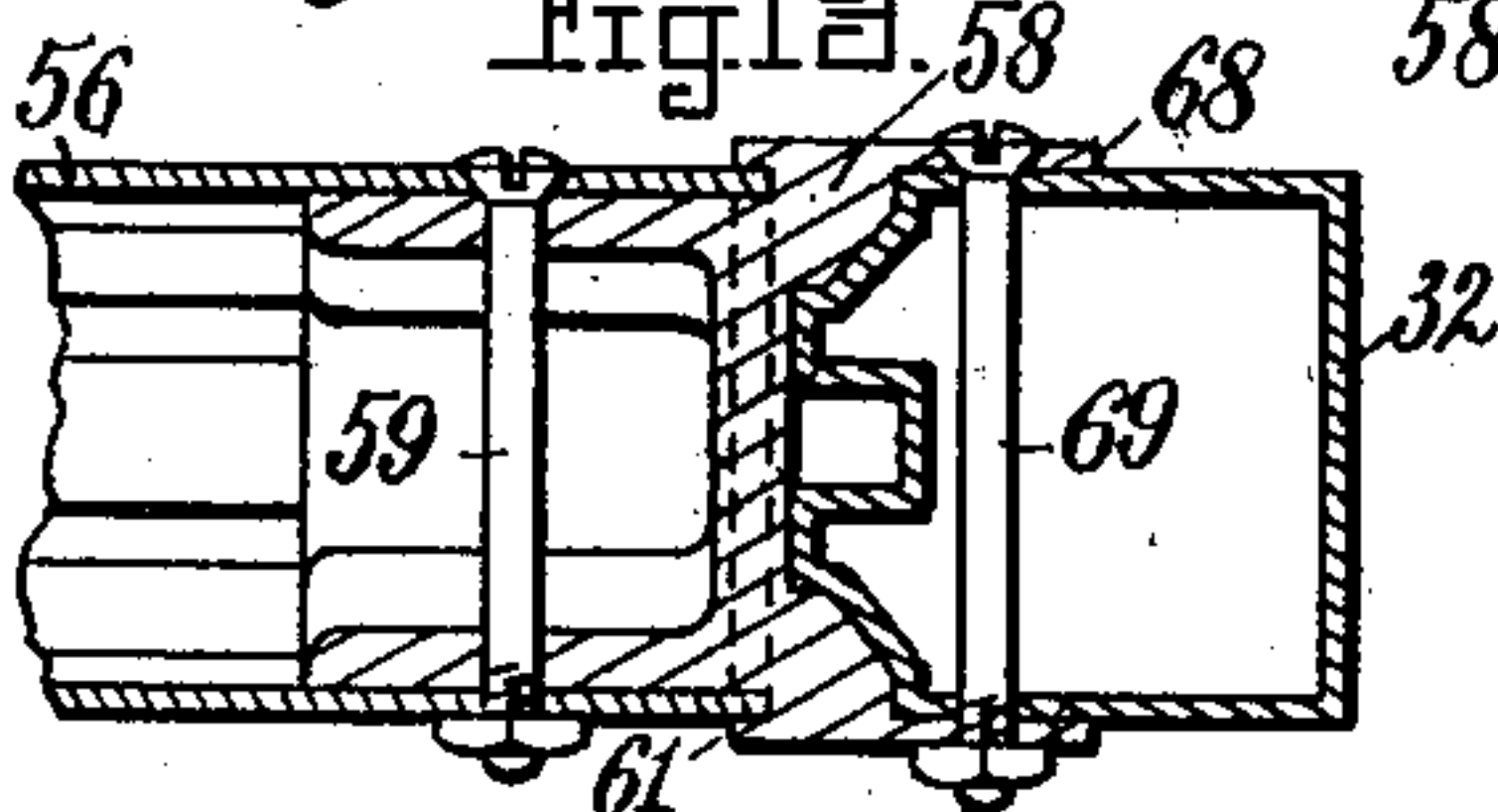
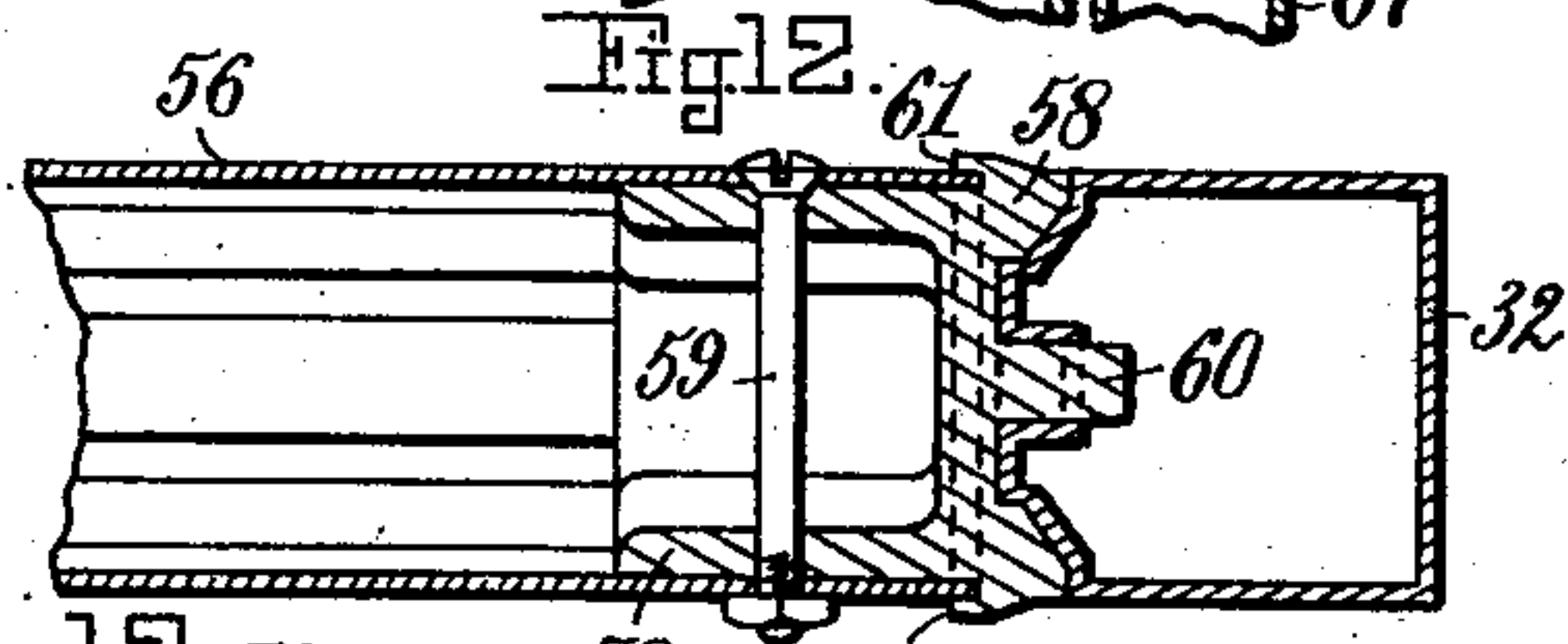
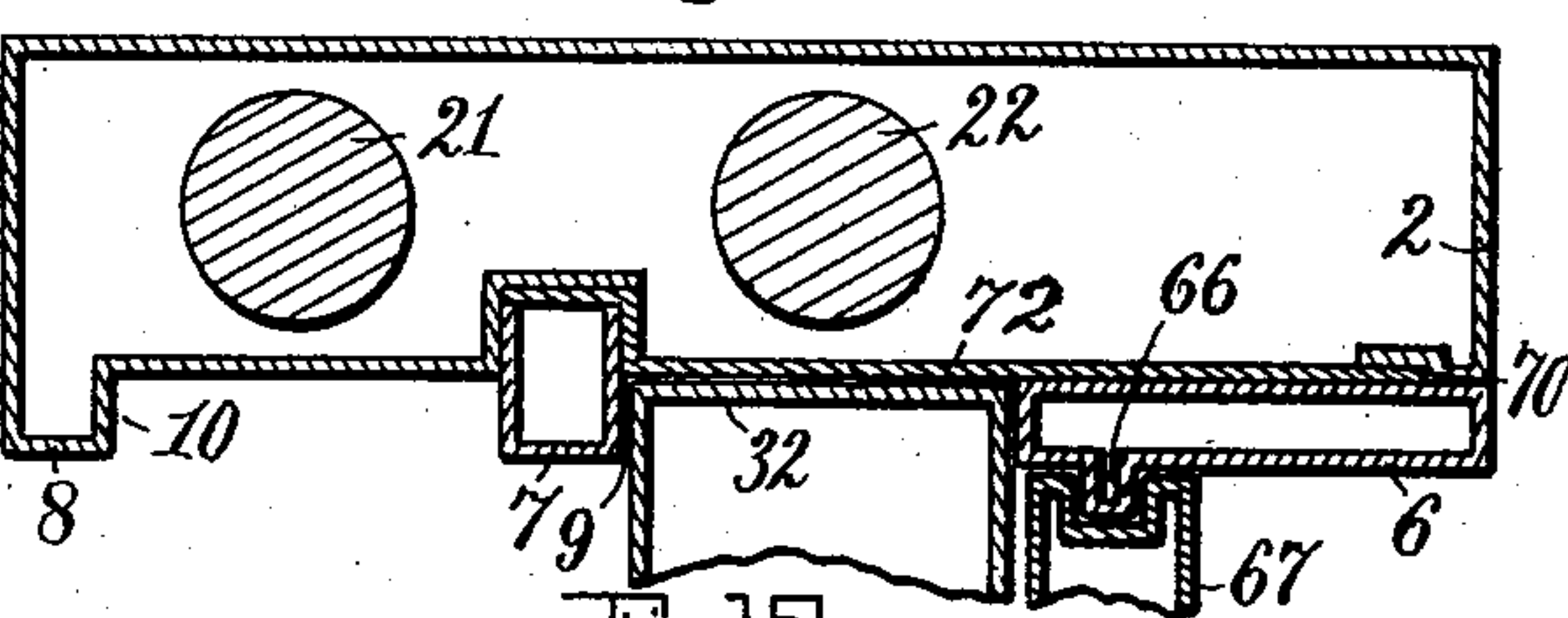
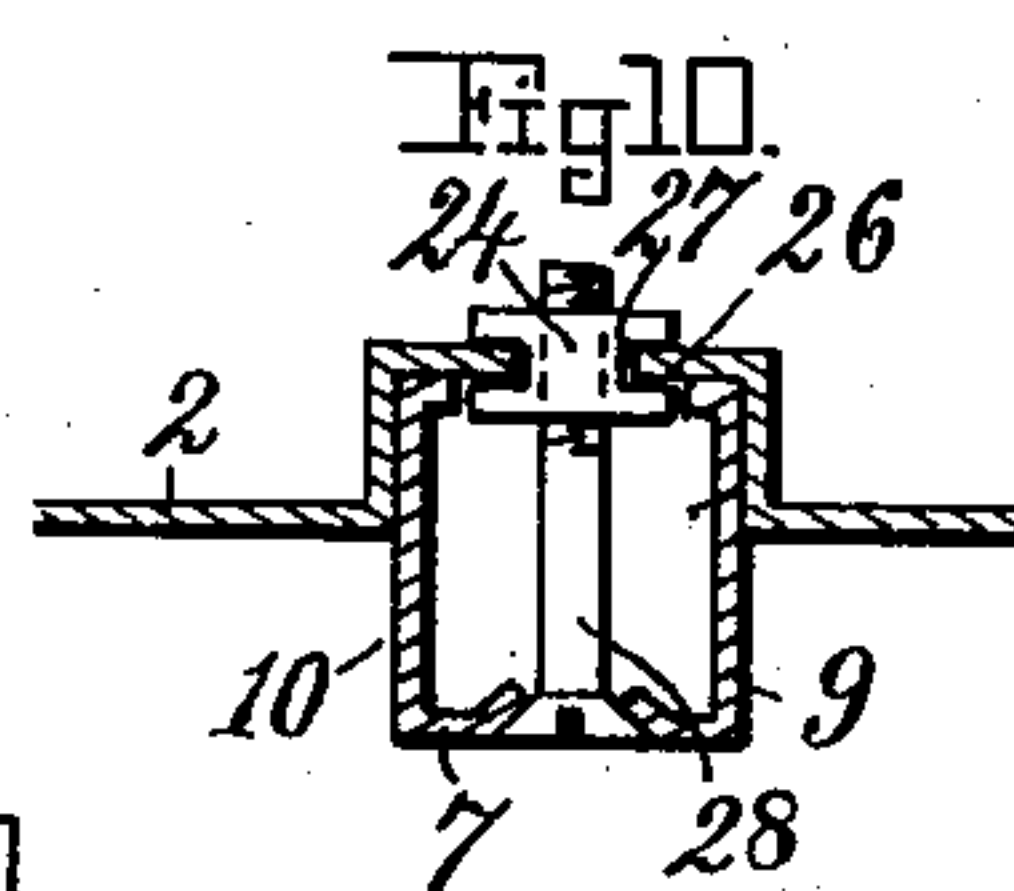
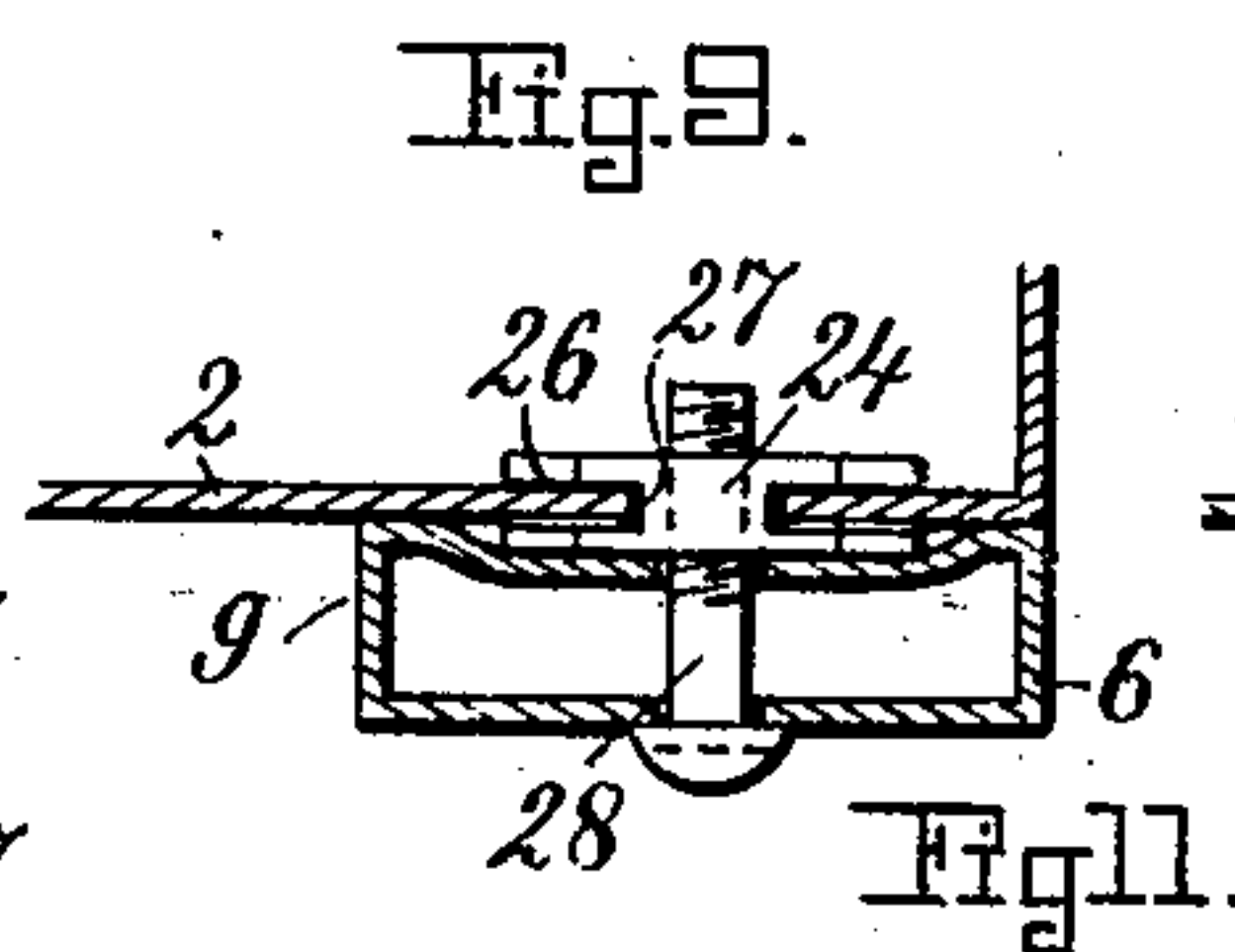
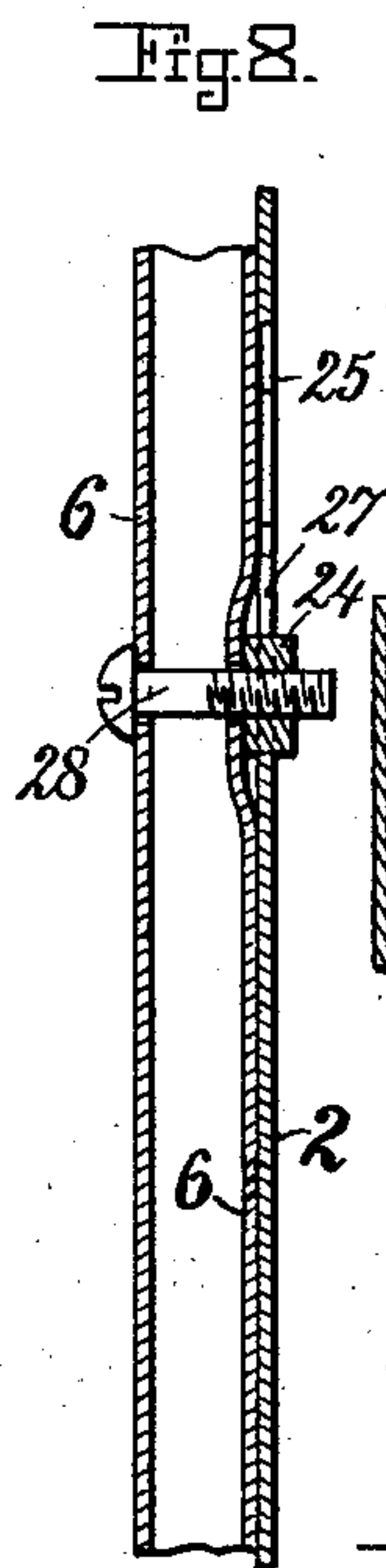
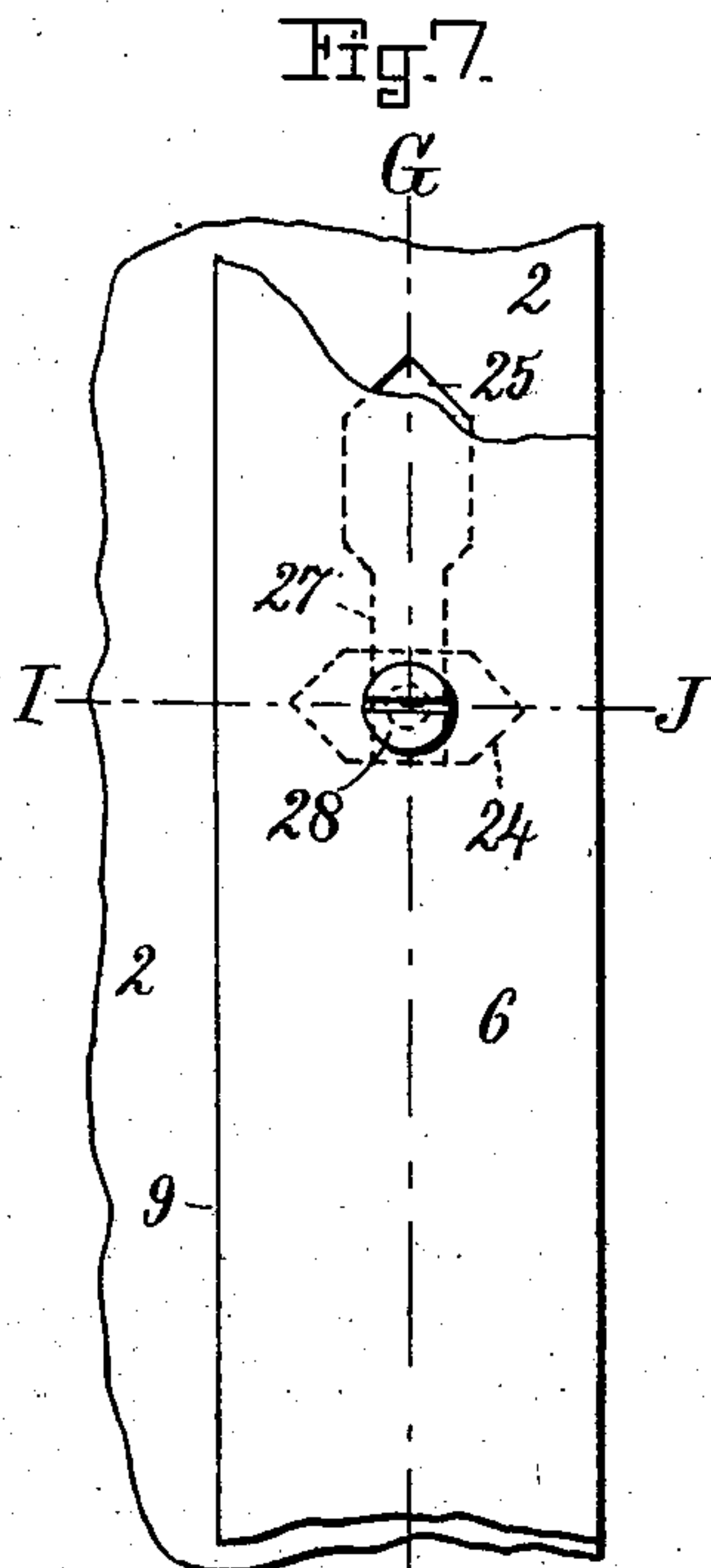
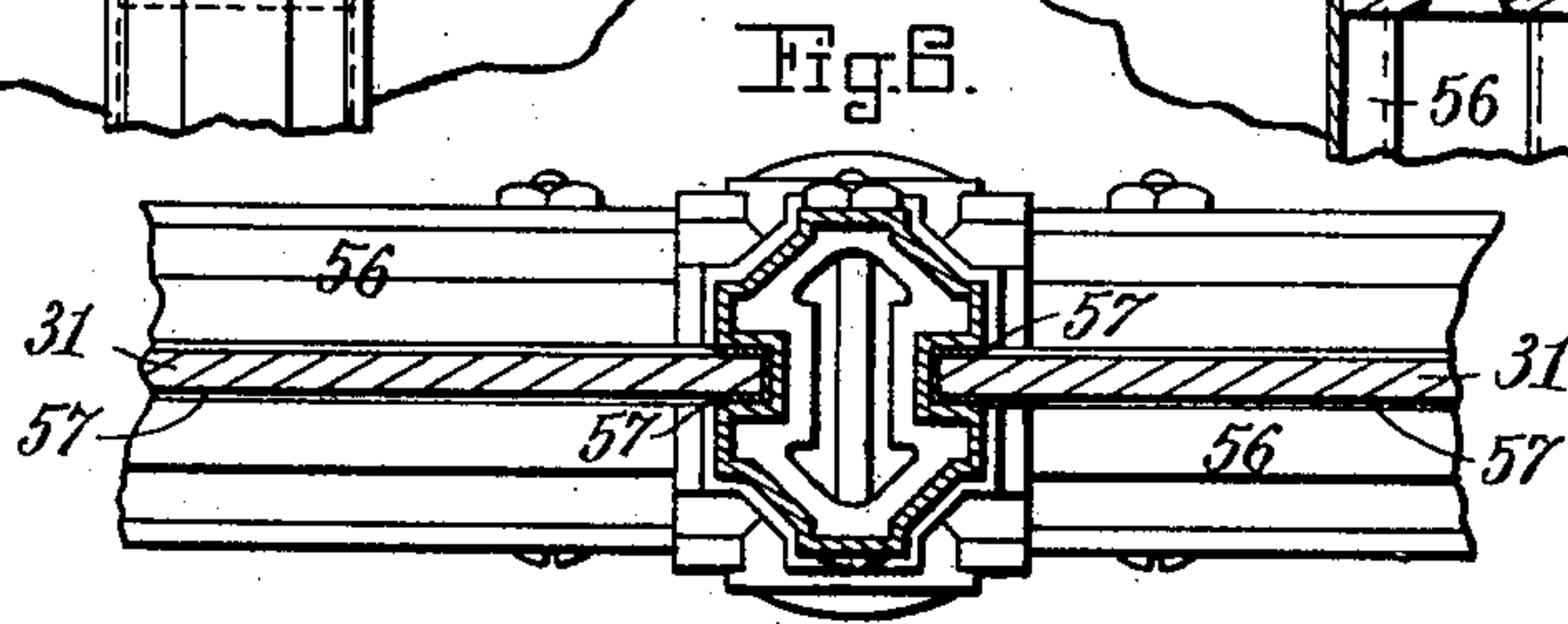
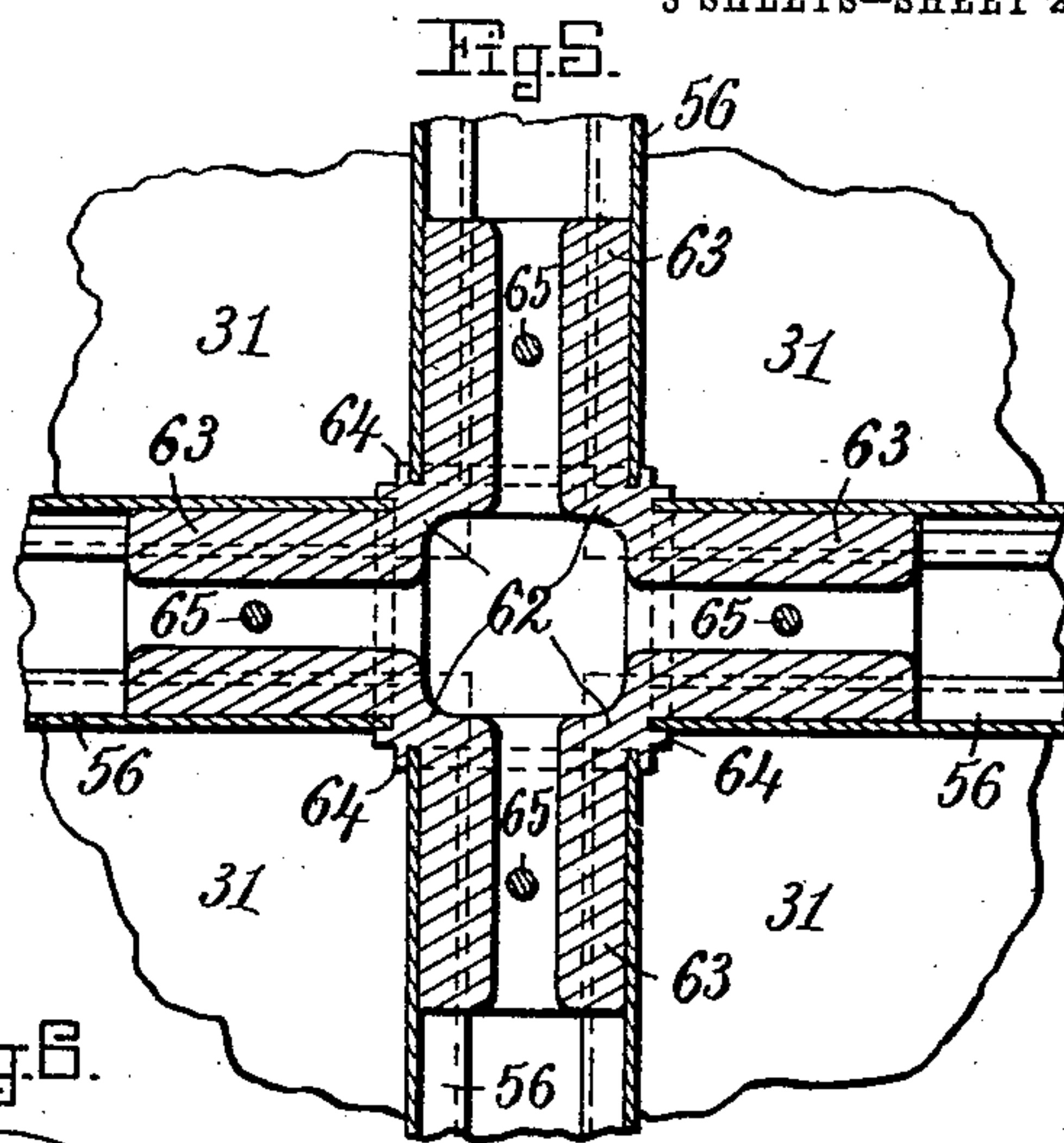
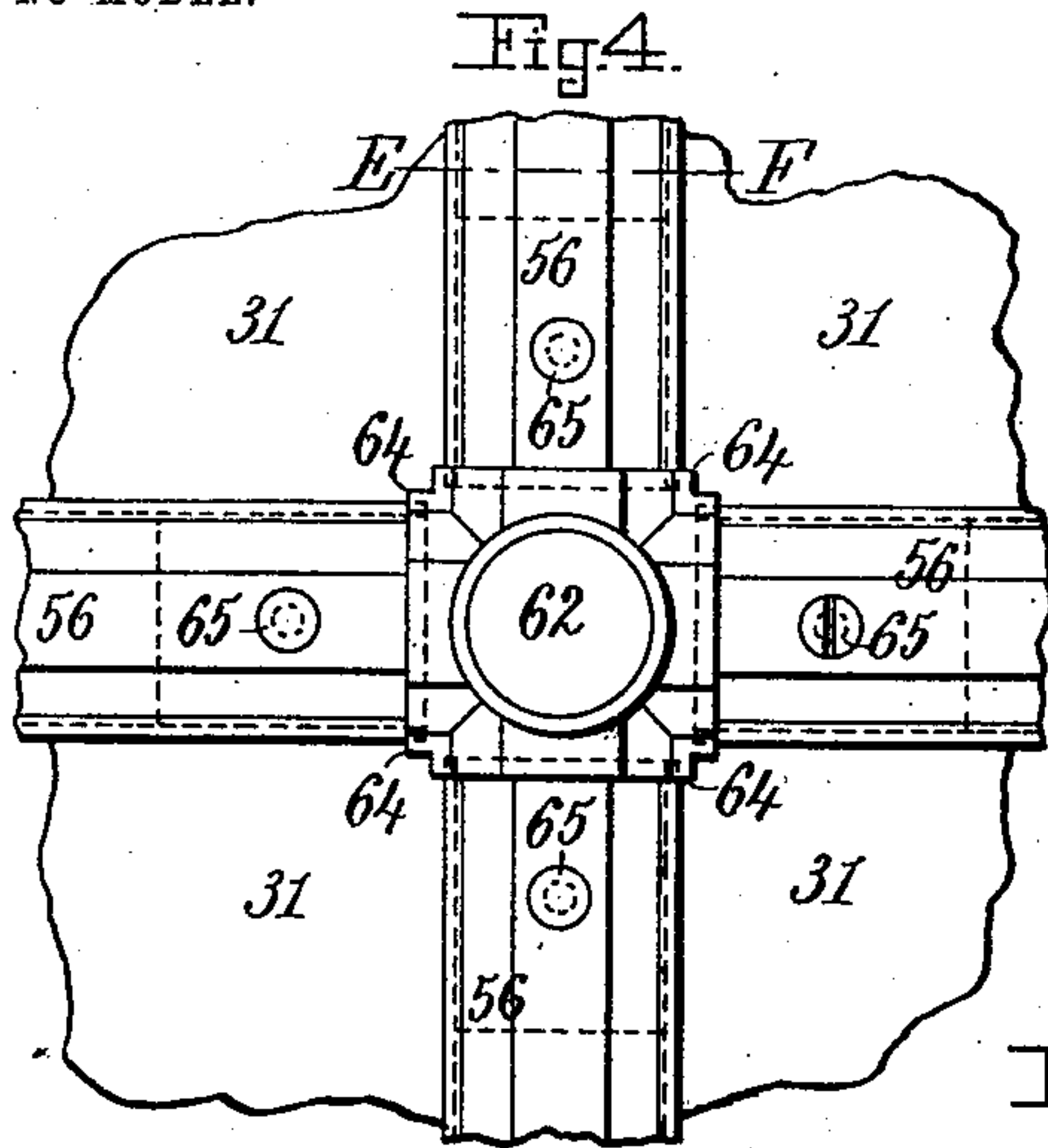
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NO MODEL.

3 SHEETS—SHEET 2.



Witnesses
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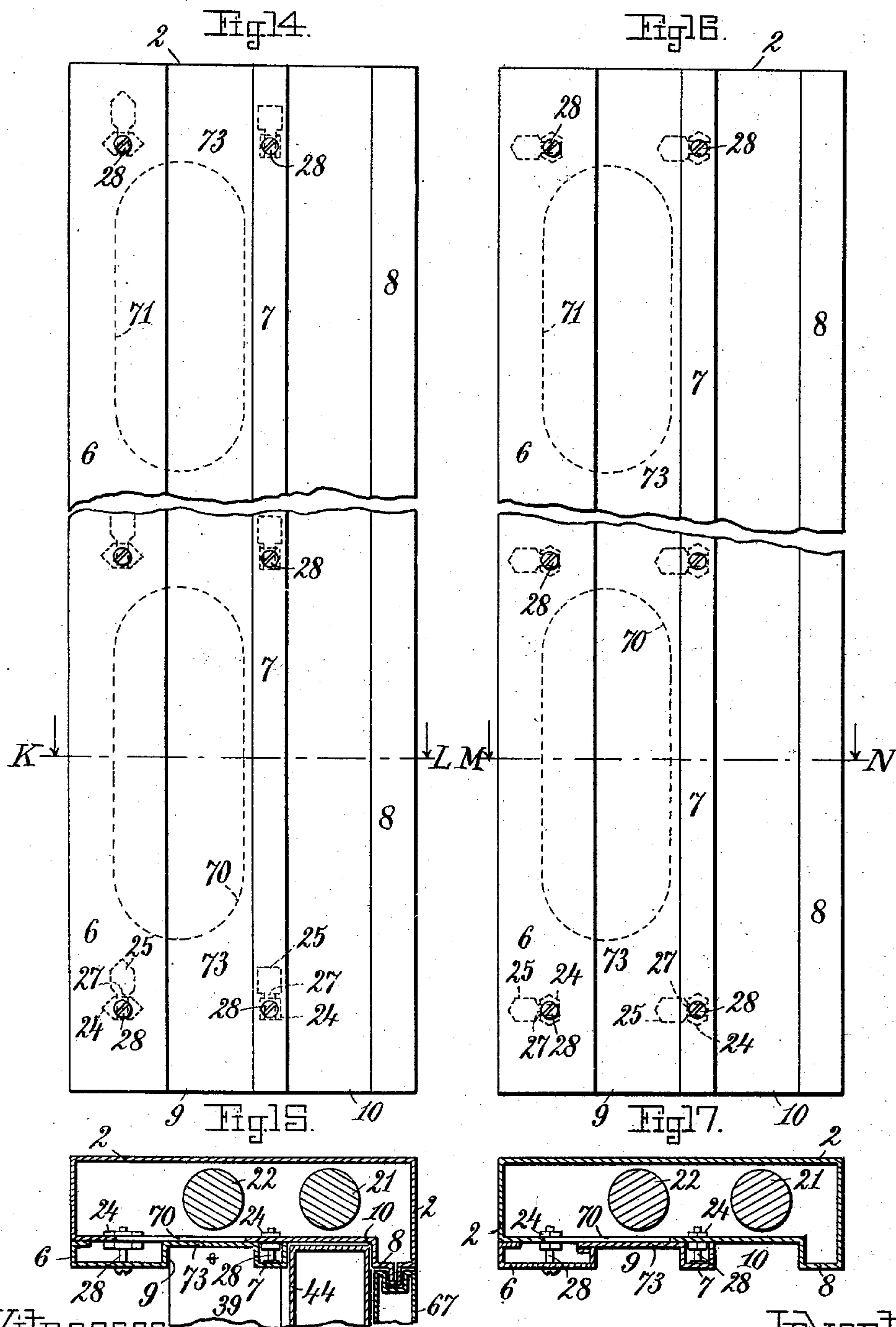
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FIREPROOF WINDOW FRAME AND SASH.

APPLICATION FILED APR. 1, 1903.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

ISAIAH W. EMERSON, OF MILFORD, MASSACHUSETTS.

FIREPROOF WINDOW FRAME AND SASH.

SPECIFICATION forming part of Letters Patent No. 754,437, dated March 15, 1904.

Application filed April 1, 1903. Serial No. 150,642. (No model.)

To all whom it may concern:

Be it known that I, ISAIAH W. EMERSON, of Milford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Fireproof Window Frames and Sash, of which the following is a specification.

This invention relates to improvements in the manufacture of fireproof window frames and sash; and it has for its objects to produce a frame and sash of sheet metal which can be easily assembled or taken apart, one in which the use of solder joints will be obviated, which will be neat in appearance, and will be very effective in accomplishing the object for which it is intended.

The invention consists in bending sheet metal into hollow forms corresponding in cross-section to the outline of the various parts of the frames and sash, providing castings for the corners and meeting portions of the same which will form telescopic joints with the hollow sheet-metal parts and be secured thereto by bolts, rivets, or screws in order to hold the parts detachably but firmly assembled, and also in minor details of construction, arrangement, and combinations of parts, as will be fully described hereinafter and claimed, and the invention is carried out substantially as illustrated on the accompanying drawings, which form an essential part of this specification, and whereon like characters of reference refer to like parts wherever they occur.

On the drawings, Figure 1 represents a vertical cross-section of a window frame and sash made in accordance with my invention and showing the window as having an upper and a lower sash, each sash provided with one pane of glass only. Fig. 2 represents a partial vertical longitudinal section of the window frame and sash on the line A B in Fig. 1. Fig. 3 represents a partial longitudinal section of the window frame and sash on the line C D in Fig. 1. Fig. 4 represents a detail side elevation of the joint between four meeting muntins of a sash having four or more panes of glass. Fig. 5 represents a longitudinal section of the joint shown in Fig. 4. Fig. 6 represents a cross-section of the same joint on the line E F in Fig. 4. Fig. 7 represents an elevation of

a portion of the stop-bead, showing the manner of attaching it to the window-frame. Fig. 8 represents a vertical section on the line G H in Fig. 7. Fig. 9 represents a cross-section on the line I J in Fig. 7. Fig. 10 represents a detail cross-section of the parting-bead of a window-frame, showing the manner of fastening it in place. Fig. 11 represents a detail cross-section of the side of a window-frame, showing the same provided with means to hold the frame of a fly-screen. Fig. 12 represents a detail sectional view showing the joint between a muntin and the side of the sash. Fig. 13 represents a modified form of the joint shown in Fig. 12. Figs. 14 and 15 represent, respectively, an elevation of the top and bottom portion of the side of the window-frame and a cross-section of the same on the line K L, showing the preferred manner of providing pockets for the removal or repairs of the sash weights and cords. Figs. 16 and 17 represent, respectively, an elevation and a section on the line M N of a slightly-modified arrangement for the same purpose.

The sill 1 of the window-frame is made of cast metal or sheet metal bent into proper shape, being preferably made hollow, as shown, and the outline of its cross-section is substantially the same as the outline of the window-sills now in common use; but it may vary in shape to suit requirements. The sides 2 of the window-frame are made of sheet metal bent so that the outline of its cross-section will be the same as the outline of the cross-section of the sides of the common window-frames. Thus the sides of the frame are made hollow or tubular. These tubular sides of the frame are cut off square at each end and are slightly shorter than the desired length of the frame for a purpose to be understood by a complete description of the device.

Within the lower end of each side piece is inserted a casting 3, the lower portion of which fits the upper surface of the sill 1 and is preferably provided with one or more tenons 4, which enter correspondingly-shaped mortises in the upper surface of the sill. The casting 3 is preferably made hollow and fits within the lower end of the tubular side 2 of the frame, but is also provided with a lip 5, which ex-

tends outside that part of the lower end of the side of the frame which would be exposed to view in order to cover the lower end of the tubular side and add to the appearance of the joint at this place.

The tubular sides of the frame are each provided with a removable stop-bead 6 and a parting-bead 7, made separate or connected, and said sides are also provided with a stationary bead 8. These three beads form the grooves 9 and 10, in which the edges of the sashes move, as usual in window-frames.

The header or cap 11 of the frame is made of sheet metal bent so that its cross-section will correspond in outline to the outline of the cross-section of the common header of a window-frame, and this header may be provided with the grooves 12 and 13, registering with the grooves 9 and 10 in the sides of the frame, or the header may be formed with only one groove 12 to receive the upper part of the upper sash. This header is cut square at its ends and slightly shorter than the inside width of the frame and is attached to the sides of the frame by means of right-angle castings 14, which are preferably made hollow and have one portion fitting within the upper end of the side 2 of the frame, while the other portion fits within the hollow header. The angle-castings 14 are preferably provided with the lips 15 and 16, which project, respectively, outside the exposed portion of the joints between the sides of the frame and the casting and between the header of the frame and the casting and by covering said joints adds very materially to the appearance of the frame.

Within each angular casting 14 is pivotally mounted the pulleys 17 and 18, which carry the sash cords or chains 19 and 20, which are connected at one end to the respective upper and lower sash and at the opposite ends to the respective sash-weights 21 and 22, located within the hollow sides 2 of the frame, which therefore form boxes in which the weights travel when the sash are raised or lowered. These cords or chains pass through perforations in the header and castings in their passage from the sash to their respective pulleys.

The castings are preferably connected to the sides and header of the frame by means of the screws, rivets, or bolts 23, and preferably by means of bolts, as shown, as the same require less work and are therefore less expensive.

The stop-bead 6 and parting-bead 7 are both made from sheet metal bent into the desired shape to correspond in cross-sectional outline to the stop-beads and parting-beads now in common use. In order to attach the stop-beads and parting-beads to the hollow sides 2 of the frame, I provide the wall of the sides of the frame against which said beads rest with a series of perforations varying in width at different parts of the perforations, as shown in dotted lines in Figs. 7, 14, and 16 and for

a purpose to be understood by the following description of the device.

A nut 24, corresponding in size to the larger portion 25 of the perforation in the sides 2, is provided on its edges with the grooves 26, which are slightly wider than the thickness of the sheet metal from which the sides are made. The grooves 26 are of such a depth that they allow the nut to be moved downward into the smaller portion 27 of the perforation in the sides 2, the sheet metal at the sides of the perforation entering the grooves 26 and attaching the nut to the sides 2, thus preventing the nut from being drawn from the perforations.

A screw 28 is inserted through a perforation in the stop-bead or parting-bead and is screwed into the nut, which is held within the portion 27 of the perforation in the side of the frame, as above described. By this manner of attaching the stop-beads and parting-beads to the frame it will be seen that the same are held firmly in their proper places, but can easily be removed and replaced when desired, as the position of the lower ends of the perforations in the sides 2 is such as to cause the perforations in the several nuts to register with their respective perforations in the stop-bead or parting-beads.

By my improved manner of forming a fireproof window-frame, as above described, I am able to very easily construct a frame of any dimensions, there being no irregular joints to be formed, as the sides and headers have only to be cut off perfectly square and holes to be punched in the opposite ends of each piece at a uniform distance from the ends to receive the bolts by which the castings are attached to said parts. Therefore sheet metal of any desired length and bent into the desired shape to form the sides or the headers of a frame may be carried in stock and piece after piece be cut therefrom of the desired length for such sides or headers for the frame.

If so desired, the whole or any part of the hollow frame may be filled with wood or any other desired material. It will be understood that fireproof door-frames may be manufactured in a manner similar to that of the window-frame above described and that such a construction would come within the scope of this invention.

The fireproof sash used in this my improved fireproof window-frame is constructed substantially the same as the construction of the frame. When there are to be two sashes used and each sash to have a single pane of glass, the bottom rail 29 of the lower sash is made of sheet metal bent into a shape corresponding in cross-sectional outline to the cross-sectional outline of the corresponding part of the common sash now in use, preferably having a groove 30 formed for the reception of the pane of glass 31. This lower rail is connected to the sides 32 of the lower sash by means of

the right-angle castings 33, which have one part fitting within the lower rail and another part fitting within the side 32 of the sash. These castings are preferably made hollow, as shown, and are provided with the lips 34 and 35 to cover the joint between the parts on the exposed portions of said joint. The sides 32 of the lower sash are made of sheet metal bent into shape of those commonly used, also preferably being provided with a groove 36, formed therein to receive the glass. The upper or meeting rail 37 of the lower sash is also formed of sheet metal bent into substantially the form of the meeting-rails now in common use and has been shown as being provided with a groove 38 for the reception of the pane of glass. The sides 32 and the meeting-rail 37 are connected together by means of the right-angle casting 39, one part of the casting fitting in the side of the sash, while the other parts fit in the meeting-rail. These castings are provided with the lips 40 and 41, which cover, respectively, the joints between the castings and the sides of the sash and between the casting and the meeting-rail of the sash.

The bottom rail, the meeting-rail, and the sides of the lower sash are detachably secured to the connecting-castings by means of the screw-bolts 42 in a manner similar to the bolts which secure the parts of the frame of the window assembled and so that the parts may be easily disconnected when it is desired to reset a pane of glass which is embedded within a quantity of putty placed within the grooves in the several parts of the sash, which grooves register with each other when the sash is assembled.

The sash cords or chains 20 are connected to the top of the castings 39 in any desired manner.

The upper sash is formed in a manner similar to the lower sash, the upper rail 43, the sides 44, and the meeting-rail 45 being made of sheet metal bent into the shape of said parts as commonly made, and these parts have been shown as having the respective grooves 46, 47, and 48 formed therein for the reception of the pane of glass, which is embedded in putty within said grooves. The upper rail is connected to the sides of the sash by the right-angle castings 49, having the lips 50 and 51 to cover the joints between said parts, and the meeting-rail is connected to the sides of the sash by the right-angle casting 52, having the lips 53 and 54 to cover the joints between said parts, all in a manner similar to the parts of the lower sash, screw-bolts 55 being used to hold the parts assembled.

The sash cord or chain 19 is secured to the top of the castings 49 in any well-known manner and substantially similar to the sash-cord 20.

When it is desired to use muntins in the sash and to have more than one pane of glass, I form the muntin 56 of sheet metal bent into a form

corresponding with the outline of common muntins now in use in wooden windows. These muntins have been shown as being provided on opposite sides with the grooves 57 for the reception of the glass instead of providing the muntins with the usual rabbets as commonly used. These connections are cut square at their ends and are slightly shorter than the distance between the two parts of the sash which they are to join. I provide castings 58 at each end of the muntins, which castings are inserted within the muntin and secured therein by means of the screw-bolts 59. These castings are provided with a tenon 60, adapted to enter a perforation in the part of the sash to which they are to be joined, and they are also preferably provided with the lips 61, which cover the joint between the muntin and the casting. The outer end of the castings 58 are formed so that they fit perfectly against the surface of the part of the sash against which they are to rest, and therefore form a perfect joint at this place, substantially as shown in Fig. 12.

When the sash is formed with a number of panes of glass in the upper part and a number of panes of glass in the lower part of each sash, it is necessary that there should be a joint formed between two or more muntins, and I have shown such a joint in Figs. 4, 5, and 6, showing the joint as made between four meeting muntins.

A casting in use, consisting of a central portion 62, which may be made ornamental, if desired, and this central portion has four radiating portions 63, which fit and enter the squared ends of the muntins 56. The casting is preferably provided with the lips 64 to cover the joints between the casting and the muntins. These castings, like the others, are preferably made hollow, as shown, and are removably secured within the muntins by means of the bolts 65.

By making a sash in the manner above described it will be seen that it is very easily assembled and can be taken apart easily when it is desired to repair broken glass or damaged parts of the sash.

When it is desired to use a fly-screen upon the interior of my improved window-sash, I prefer to bend the sheet metal used in forming the stop-bead so that there will be an additional bead 66 formed on the surface of the stop-bead and upon which the fly-screen 67 may slide, as shown in Fig. 11.

In some cases it may be preferred to dispense with the tenon 60 in the castings 58, inserted within the ends of the muntins 56, and provide said castings with an ear 68, which extends on one or both sides of the part of the sash to which the muntin is to be attached and may secure said parts firmly together by means of the bolts 69 passing through said ears and a portion of the sash and substantially as shown in Fig. 13.

In order to provide easy access to the interior of the hollow sides 2 of the window-frame for the purpose of inserting, removing, and repairing the sash weights and cords and chains, I provide each side of the frame with an aperture 70 near the lower end of the side of the frame, as shown in section in Figs. 11, 15, and 17 and in the dotted lines in Figs. 14 and 16, and I also preferably provide each side of the frame with a second and similar aperture 71 near the upper end of the side of the frame, as shown in dotted lines in Figs. 14 and 16. These apertures are of such a shape and size and are made in such positions on the side of the frame as to allow of the proper manipulation of the weights and cords through said apertures. These apertures may be closed by separate pieces 72 fitting therein, as shown in Fig. 11, and similar to the pockets made in the sides of window-frames now in common use; but I prefer to close said apertures by making the stop-bead 6, the parting-bead 7, and a plate 73, of sheet metal, extending the entire length of the side and covering the entire space between the stop-bead and the parting-bead, as shown in Figs. 14 and 17, both inclusive, which plate may be made as an integral part of the stop-bead and parting-bead, as shown in Fig. 15, or as an integral part of the parting-bead, as shown in Fig. 17, but in either case being held in proper position against the side of the frame by the bolts which hold the stop-bead and the parting-bead in place.

By the use of the plate 73 to cover the apertures in the sides of the frame I am able to cover the same without having any additional joints to appear other than those which are necessary between the sides of the frame, the sill, and the header, and therefore do not detract from the appearance of the frame by the use of said apertures. By making the stop-bead detached from the plate 73 and forming the perforations in the sides of the frame, by which the nuts are locked to the frame, in a horizontal position, as shown in Fig. 16, instead of in a vertical position, as shown in Fig. 7, I am able to slightly adjust both the stop-bead and the parting-bead relative to the stationary bead and can thus prevent any looseness of the sash in the grooves formed by said beads.

It will be understood that although I have shown the telescopic joint between the various parts of the frame and sash and the castings which connect said parts as having the casting inserted within said parts it is within the scope of my invention to use the equivalent construction of having the various parts of the frame and sash constructed so as to be inserted within the castings.

From the above description of my improved fireproof sash and window-frame it will be seen that the same are made without a soldered joint, that the several parts are easily taken apart or assembled, that although the various parts are made hollow they may be filled, if so desired, and that the weights and cords or chains are easily reached for repairs or for other purposes.

Having thus fully described the nature, construction, and the operation of my invention, I wish to secure by Letters Patent and claim—

1. In a fireproof window sash and frame, the several parts made of sheet metal bent into tubular shape, combined with castings at the joints between said parts entering the tubular parts and connecting them together, said castings provided with lips covering the joint between said parts.

2. In a fireproof window-sash, muntins made of sheet metal bent into tubular shape, castings at the meeting place of a plurality of muntins forming telescopic joints whereby the muntins are connected together and castings attached to the end of the muntins having means whereby they may be secured to other parts of the sash.

3. In a fireproof window-frame, side pieces made of sheet metal, bent into the desired shape, a stop-bead made of sheet metal bent into the desired form, slotted perforations in the sides of the frame each slot varying in size at different parts thereof, a grooved nut adapted to be inserted within the larger part of the slot in the sides of the frame and held therein by movement into the smaller part of said slots and receiving the metal of the sides of the frame within the grooves in the nut, perforations in the stop-bead, and a screw-bolt inserted through said perforations and screwed into the nut.

4. In a fireproof window-frame, side pieces made of sheet metal bent into the desired shape, a parting-bead made of sheet metal bent into the desired form, slotted perforations in the sides of the frame each slot varying in size at different parts thereof, a grooved nut adapted to be inserted within the larger part of the slot in the sides of the frame and held thereon by movement into the smaller part of said slots and receiving the metal of the sides of the frame within the grooves in the nut, perforations in the parting-beads and a screw-bolt inserted through said perforations and screwed into the nut.

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

ISAIAH W. EMERSON.

Witnesses:

HENRY CHADBURN,
CORA J. CHADBURN.