

No. 698,168.

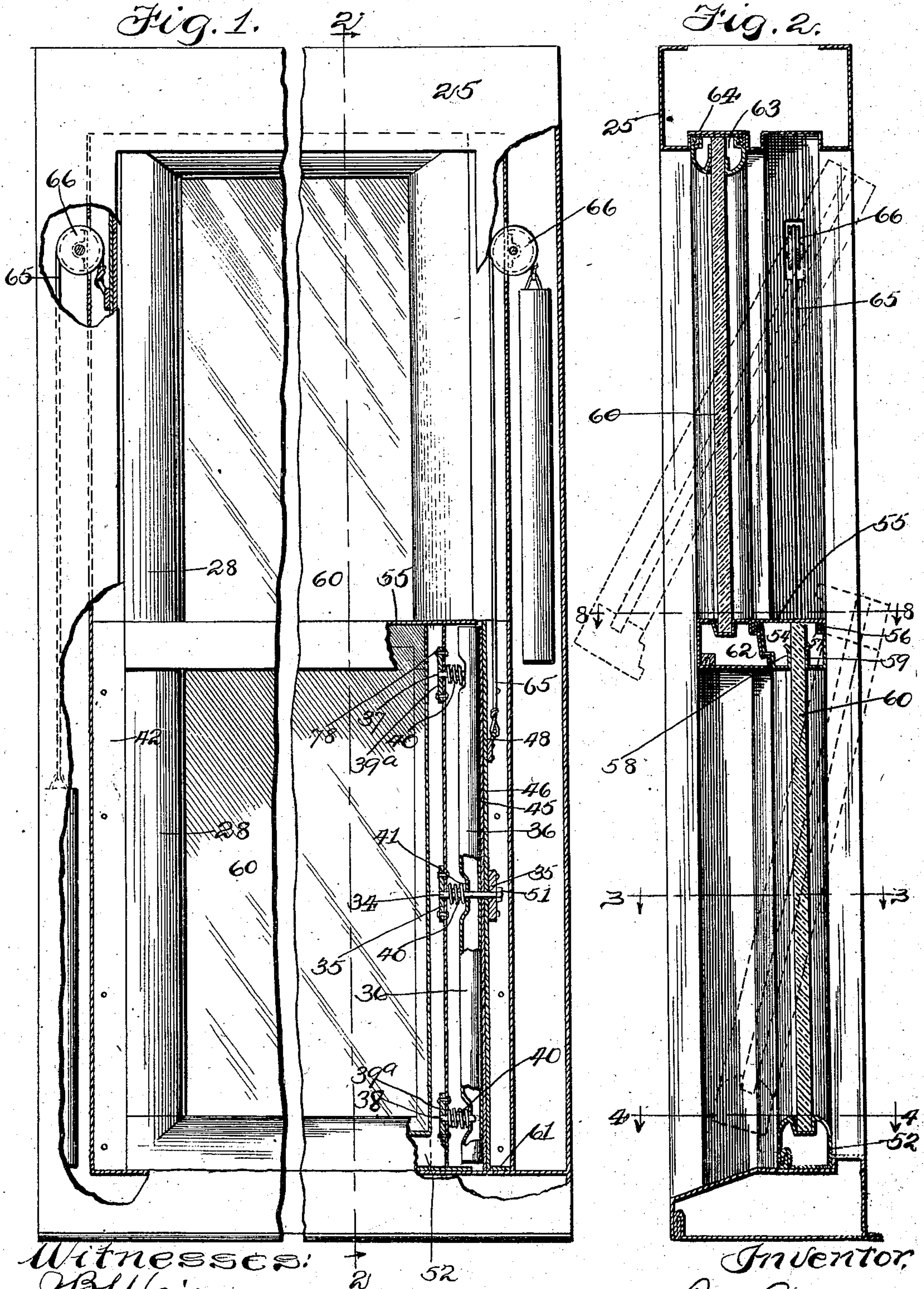
Patented Apr. 22, 1902.

P. BARNUM.
WINDOW SASH

(Application filed Oct. 26, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:
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C. D. Perry

Inventor,
Paul Barnum,
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his Attorneys

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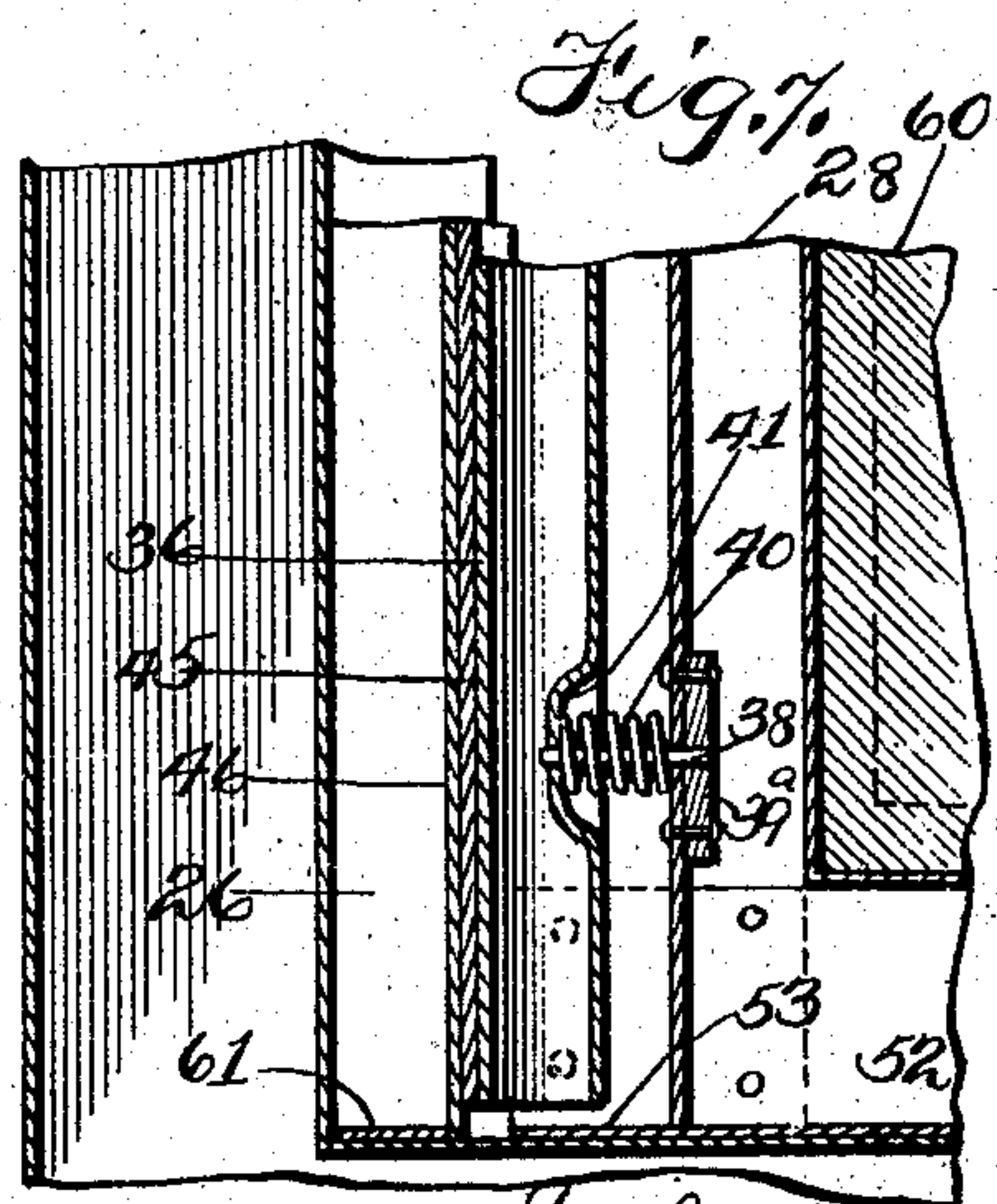
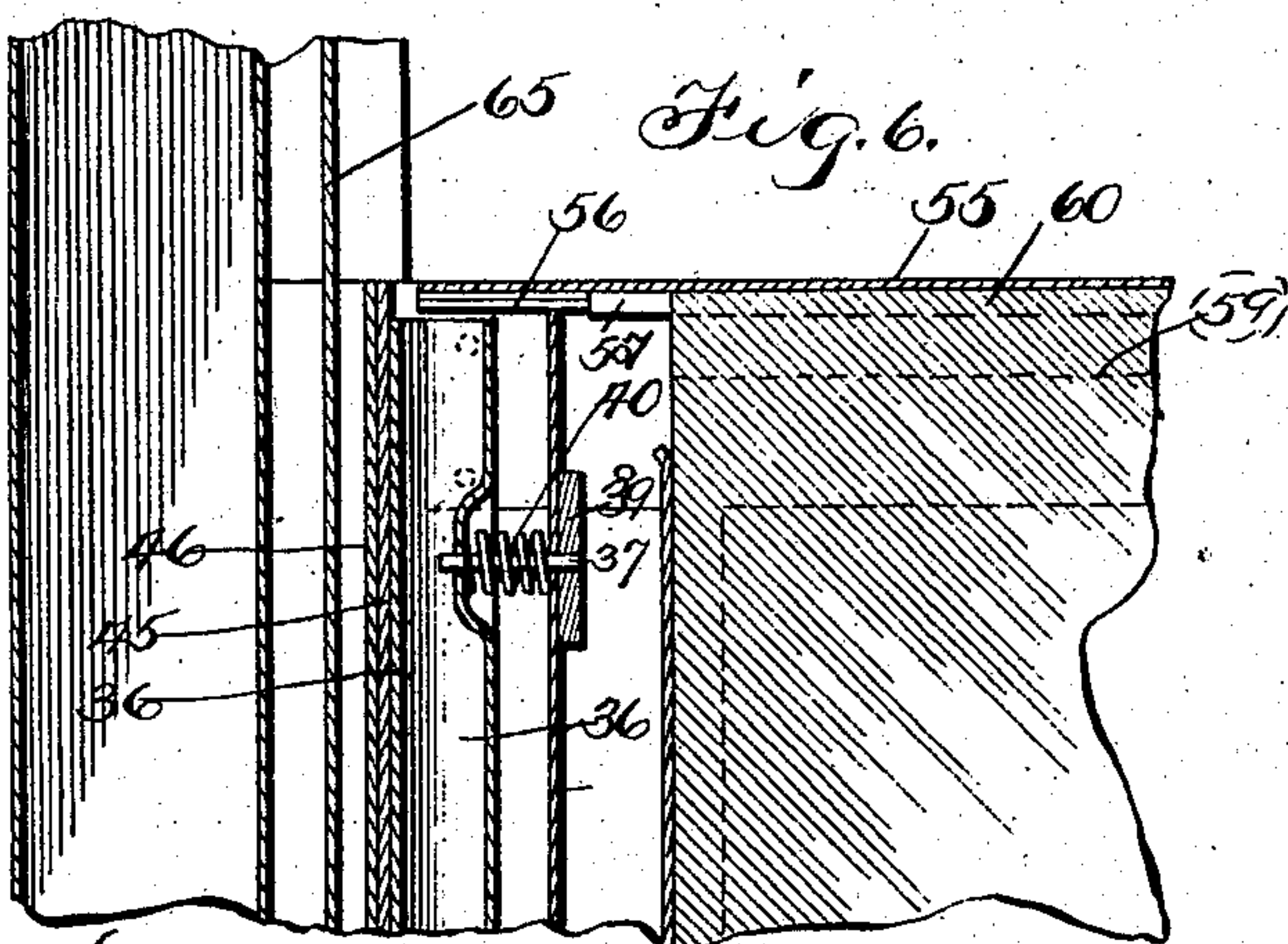
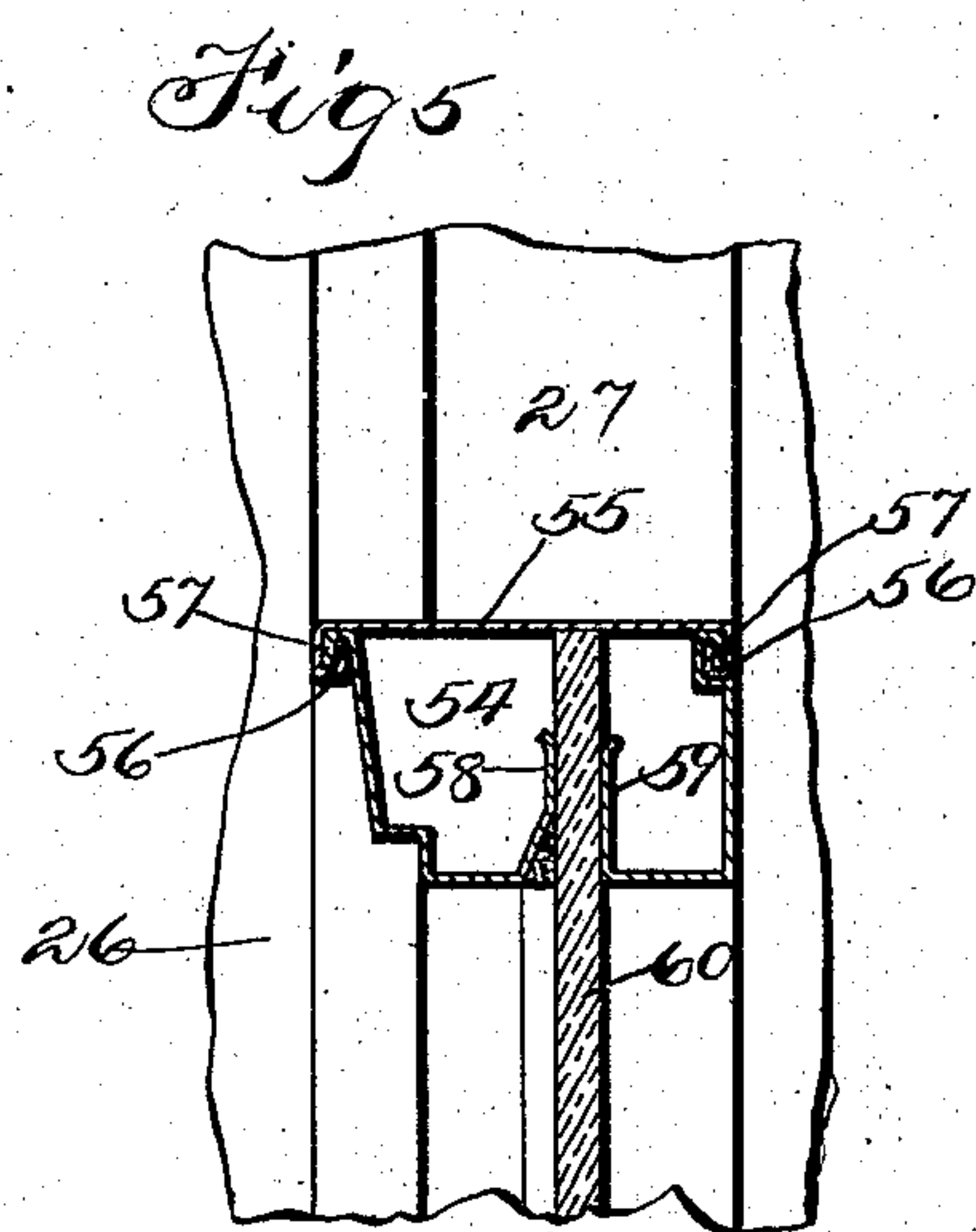
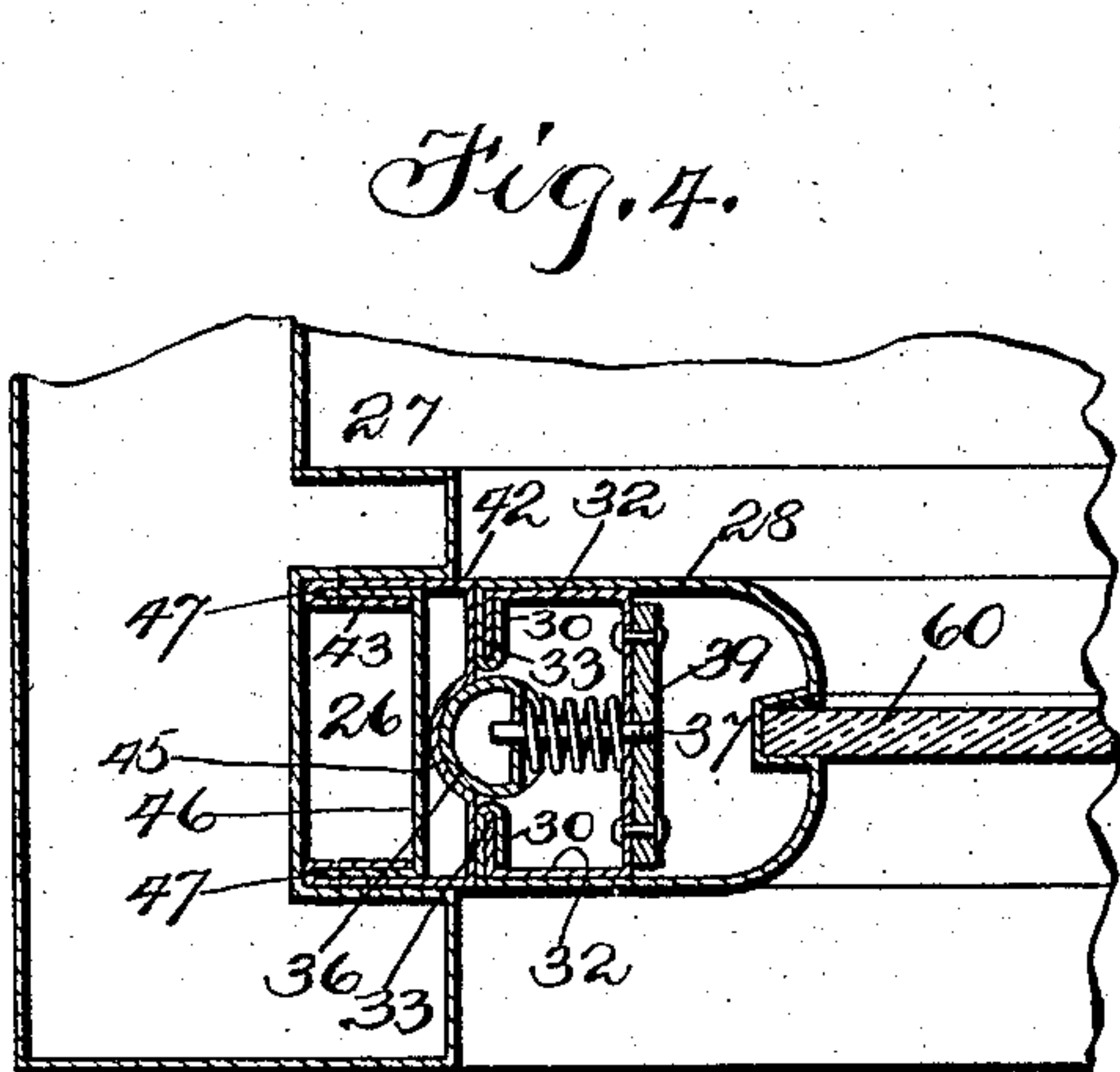
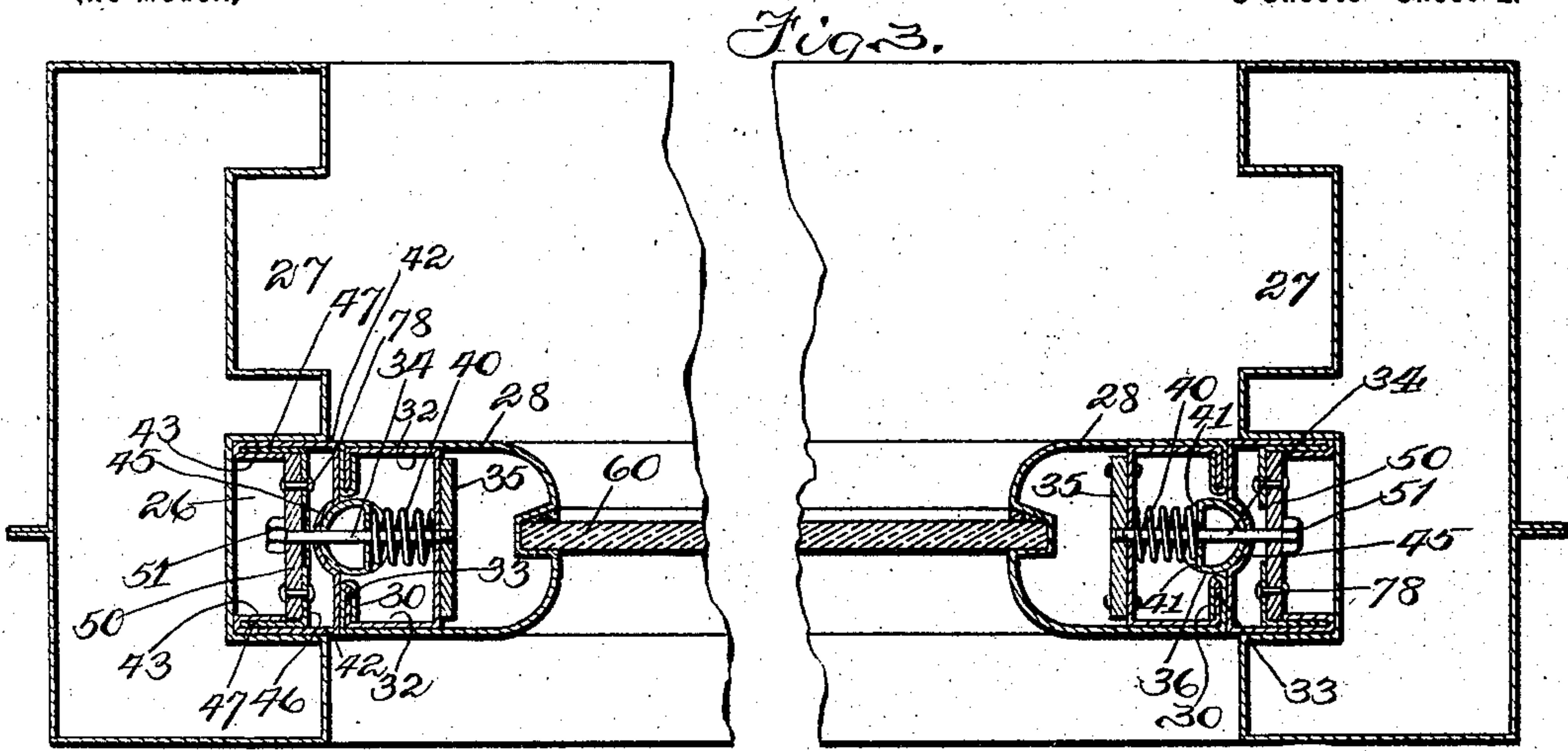
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5 Sheets—Sheet 2.



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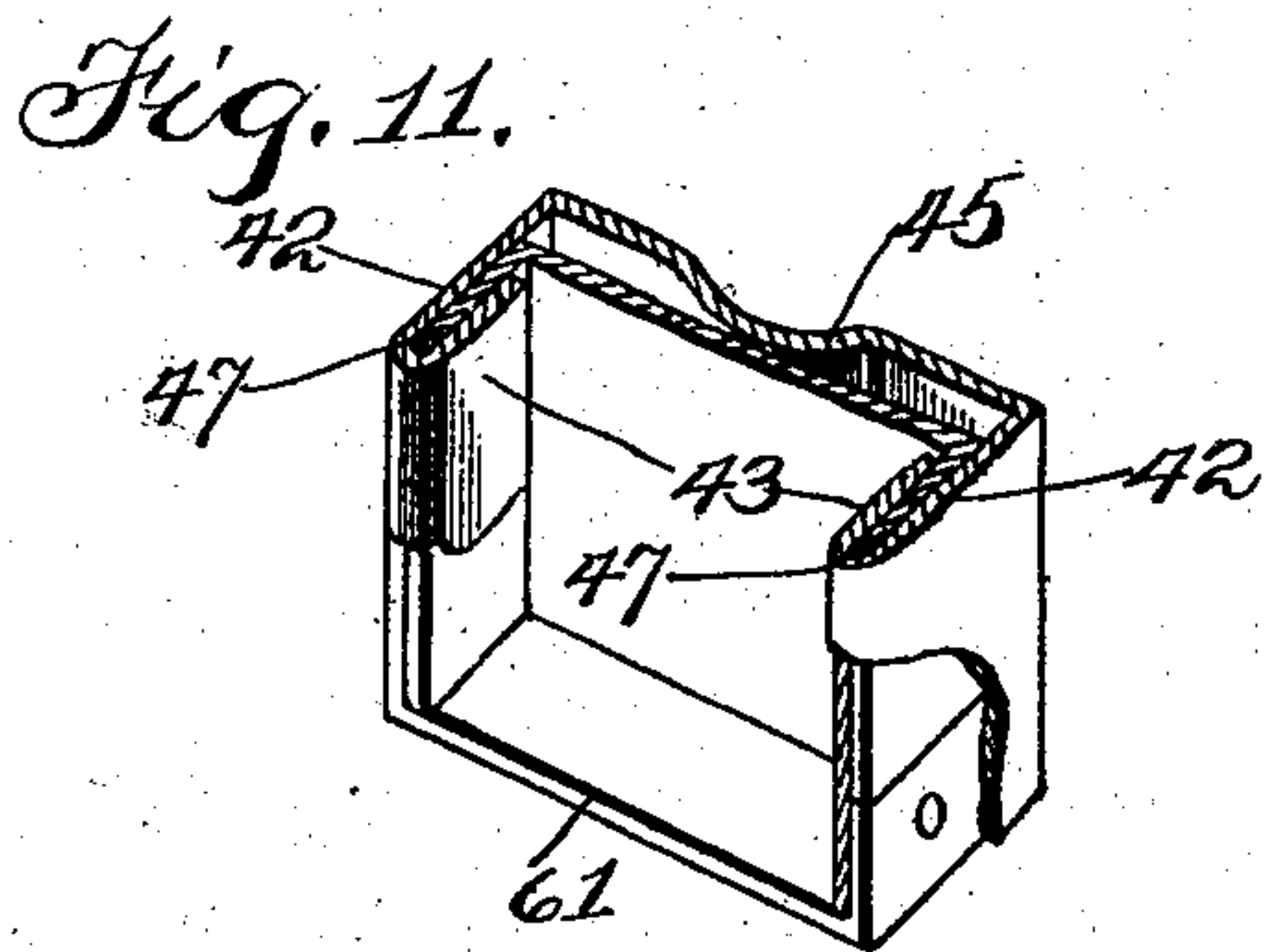
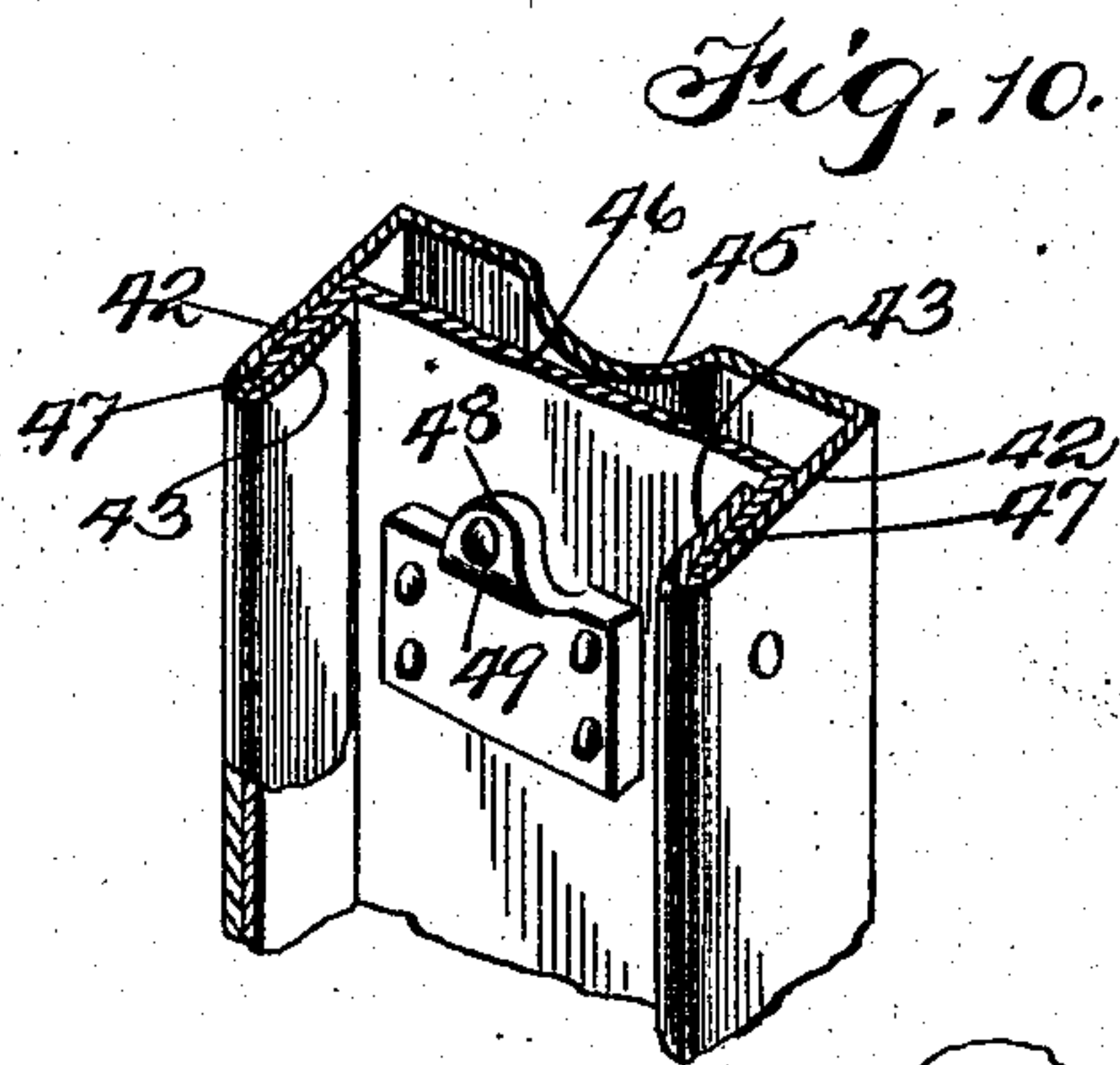
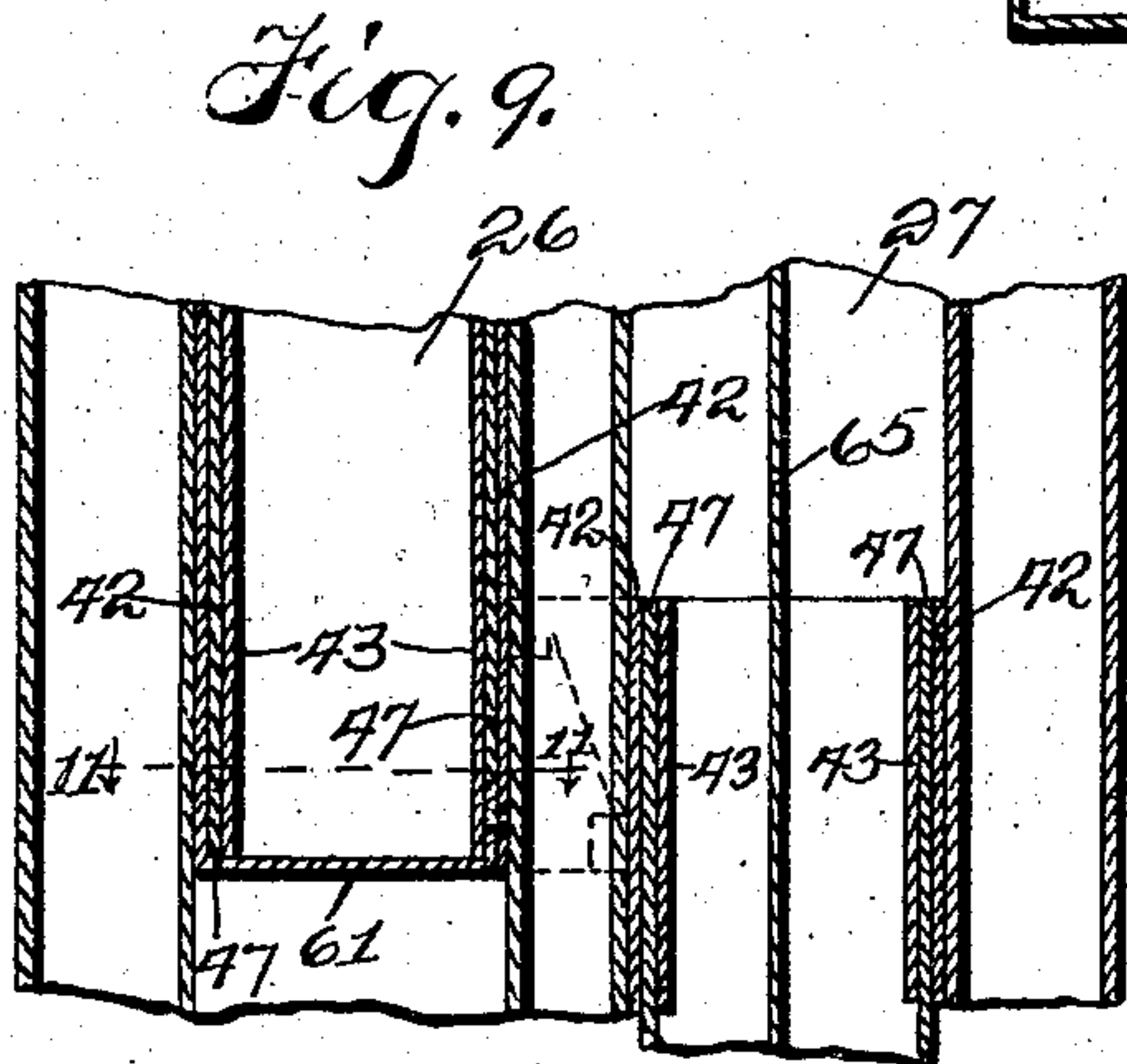
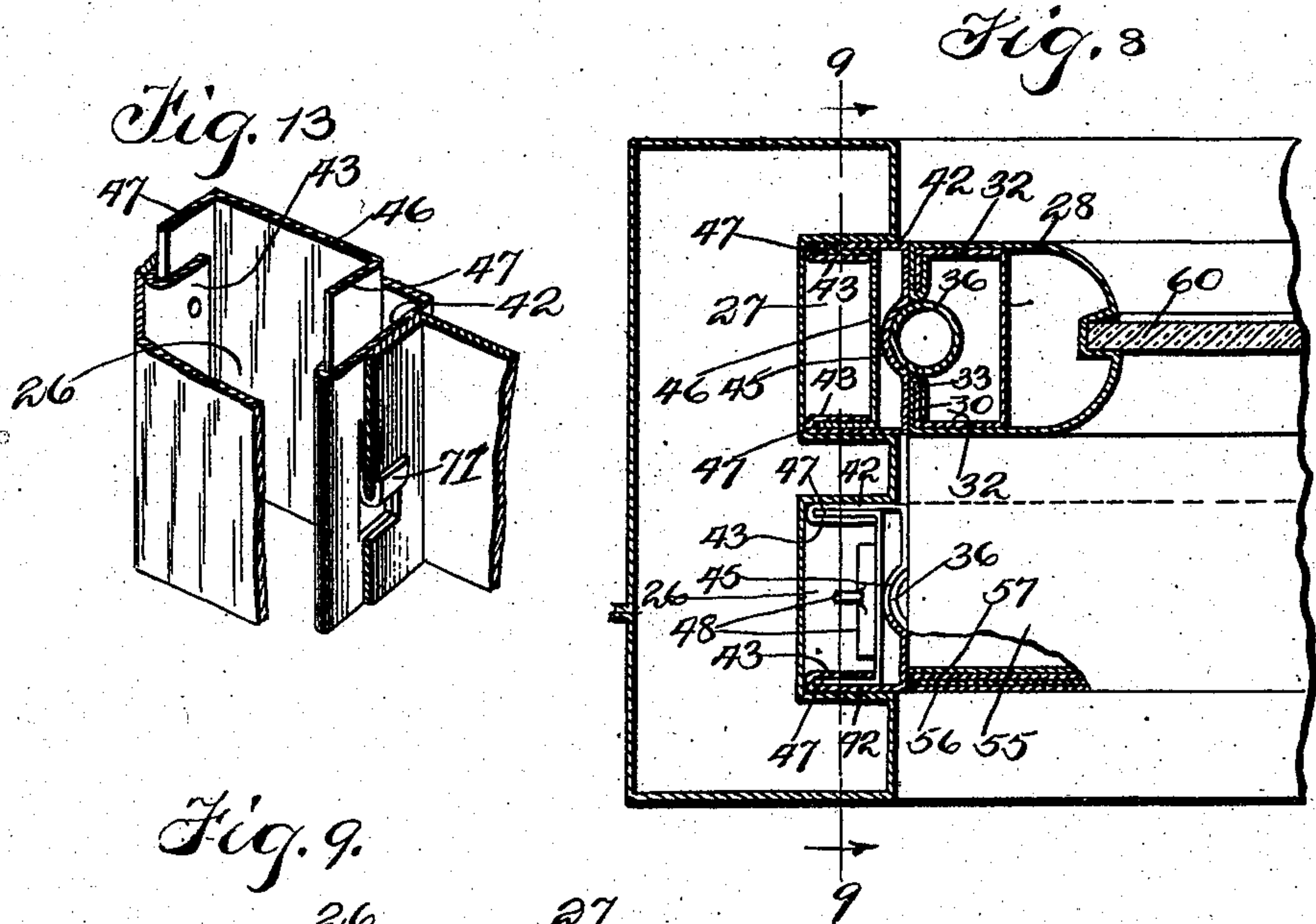
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WINDOW SASH.

(Application filed Oct. 26, 1901.)

(No Model.)

5 Sheets—Sheet 3.



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No. 698,168.

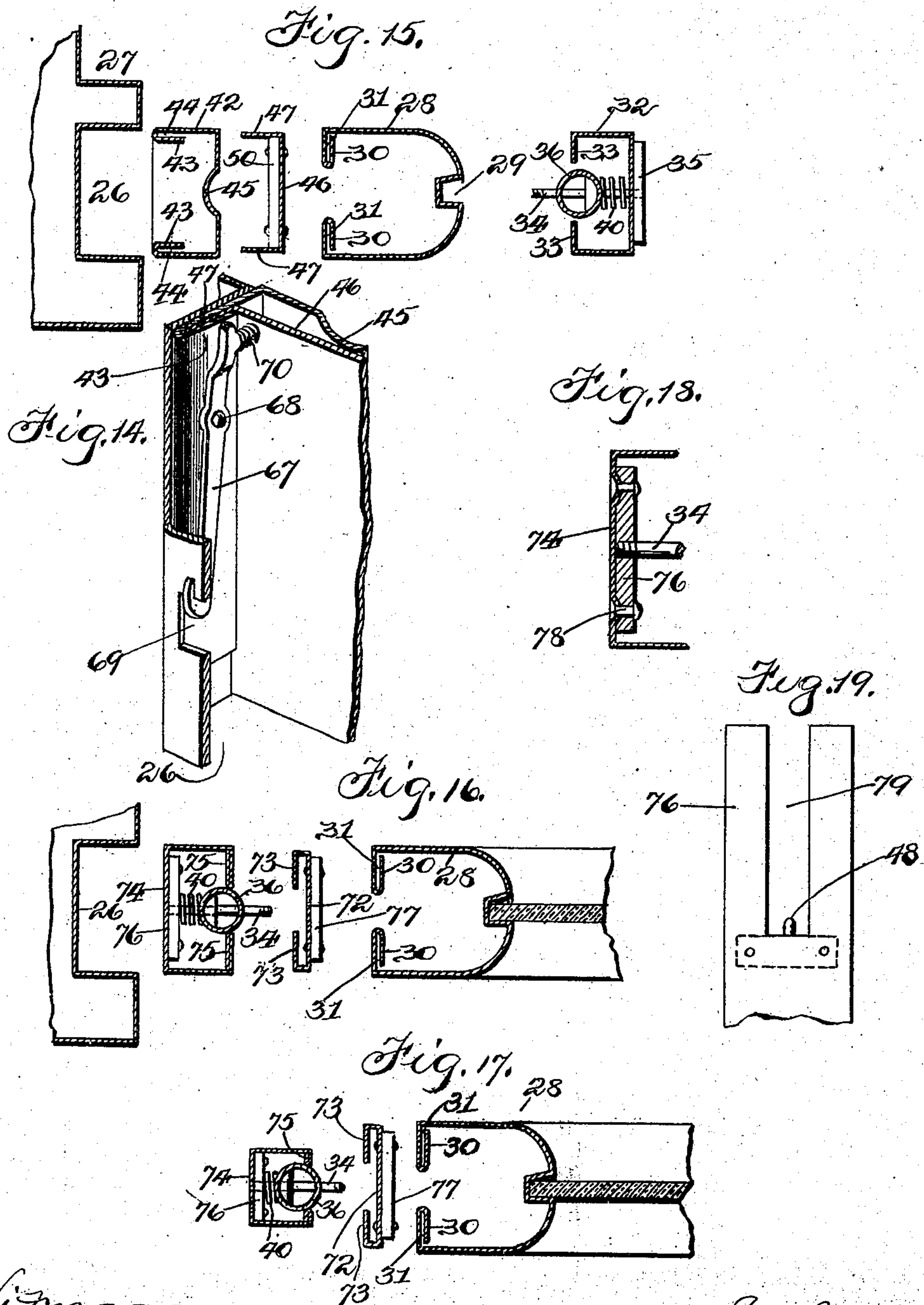
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WINDOW SASH.

(Application filed Oct. 26, 1901.)

(No Model.)

5 Sheets—Sheet 4.



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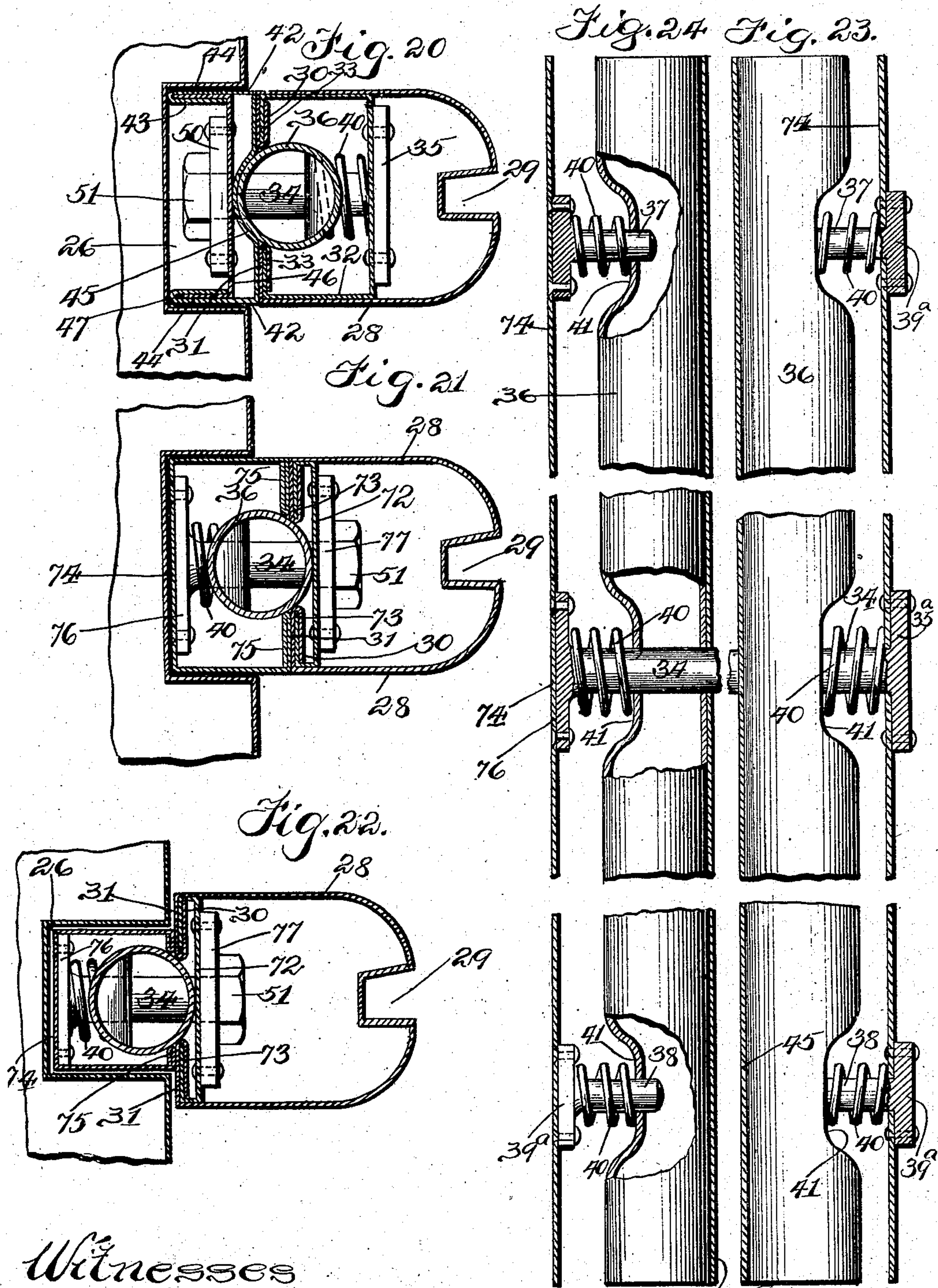
Patented Apr. 22, 1902.

P. BARNUM.
WINDOW SASH.

(Application filed Oct. 26, 1901.)

(No Model.)

5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

PAUL BARNUM, OF SAN FRANCISCO, CALIFORNIA.

WINDOW-SASH.

SPECIFICATION forming part of Letters Patent No. 698,168, dated April 22, 1902.

Application filed October 28, 1901. Serial No. 80,094. (No model.)

To all whom it may concern:

Be it known that I, PAUL BARNUM, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Window-Sashes, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to window-sashes, and has particularly to do with what are known as "reversible" sashes, or sashes which are arranged to swing upon pivots or trunnions arranged at the sides of the sash, so that the sash may be rocked about a horizontal axis. A sash of this character is described in Patent No. 637,502, to George O. Dean, dated November 21, 1899.

The object of my invention is to provide certain improvements in sashes of this character, by which an efficient metallic reversible sash may be secured; and to this end my invention consists in the features hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is a partial front elevation of a window frame and sash, certain parts being in section. Fig. 2 is a vertical section on line 2 2 of Fig. 1. Fig. 3 is a horizontal section on line 3 3 of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 2. Fig. 5 is a partial vertical cross-section illustrating the upper portion of the sash. Fig. 6 is a partial vertical longitudinal section illustrating the upper portion of the sash and window-frame. Fig. 7 is a similar view illustrating the lower portion of the sash and window-frame. Fig. 8 is a partial horizontal section on line 8 8 of Fig. 2. Fig. 9 is a vertical section on line 9 9 of Fig. 8. Fig. 10 is a perspective view, some parts being in section, illustrating the construction of the attaching devices for the sash-weights. Fig. 11 is a perspective view, some parts being in section, taken on line 11 11 of Fig. 9. Fig. 12 is a perspective view of the tube which constitutes the retaining-strip by which the sash is normally held in its vertical position. Fig. 13 is a partial perspective view illustrating one form of catch for holding the parts of the sash together while being put in place. Fig. 14 is a partial perspective view illustrating another form of device for the same purpose. Fig. 15 is a horizontal sectional view showing the different parts of

the sash and window-frame detached. Fig. 16 is a similar view showing a modification. Fig. 17 is a similar view showing a further modification. Fig. 18 is an enlarged detail, being a partial cross-section of the shoe shown in Fig. 16. Fig. 19 is an edge view of the upper portion of said shoe. Fig. 20 is an enlarged detail, being a cross-section of one of the stiles of the sash, the shoe, and a portion of the window-frame. Fig. 21 is a similar view of the modified form shown in Fig. 16. Fig. 22 is a similar view of the form shown in Fig. 17. Fig. 23 is a partial vertical section illustrating the construction shown in Fig. 20, the retaining strip or tube being in elevation; and Fig. 24 is a similar view of the construction shown in Fig. 21.

In reversible window-sashes as heretofore constructed it is customary when the sash is a sliding one to mount the stiles between shoes arranged to fit in the usual slides in the window-frame, the sash being mounted on pivots or trunnions between the shoes, so that it may freely swing about a horizontal axis and may also be moved vertically in the slides. The sash is held normally in its vertical position by spring-pressed strips between the stiles and the shoes, which serve to hold the stiles and shoes normally in alinement, but may readily be pressed back to permit the swinging of the sash. When the sash is not a sliding one, instead of employing the shoes the sash is pivoted in the window-frame itself. In my improved sash the same general style of construction is employed, modified, however, in many material respects, as will be hereinafter pointed out.

Referring to the drawings, in which I have illustrated my improvements as applied to a sliding sash, 25 indicates the window-frame, and 26 27, respectively, the inner and outer slides or ways for the lower and upper sashes, respectively:

28 indicates the stile, which is provided with the usual groove 29 to receive the edge of the window-pane. The stiles, as well as all the other parts of the sash, are made of sheet metal, so as to be perfectly fireproof. The shape of the stile is best shown in Fig. 15, from an inspection of which it will be seen that it is somewhat U-shaped, its edges being bent inward, preferably at right angles, and

then doubled back on themselves, as shown at 30 in Fig. 15, forming grooves 31.

32 indicates a box, which is mounted in the stile 28, forming a part thereof. Said box is also somewhat U-shaped and has its edges 33 bent inward toward each other, as shown in Fig. 15. The edges 33 are adapted to fit into the grooves 31, so that the box 32 may slide into the stile 28 by an endwise movement and when fitted therein is securely held by the bent-over edges 30, as best shown in Figs. 3 and 20. Each box 32 carries a pivot or trunnion 34, which projects therefrom, preferably at the longitudinal center thereof. One end of the pivot 34 is secured fixedly to the box, the other end projecting between the edges 33 and being adapted to engage the shoe, as will be hereinafter described. A reinforcing-block 35 is provided on the box for holding the pivot more securely. The box 32 also carries the retaining tube or strip 36, as shown in Fig. 5. I employ the term "tube" to designate the strips 36, because said strips are best made tubular in form and are so shown; but they may be solid and also non-circular in cross-section, if desired, provided they are so shaped as to perform their proper functions. It should be understood, therefore, that the term "tube" is herein used in a generic sense to indicate the strips 36, whether they be made tubular or of some equivalent construction. Said tube 36 is of about the same length as the stile 28, as shown in Fig. 1, and is somewhat greater in diameter or in its greatest width than the distance between the intumed edges 30 of the stiles 28. This is best shown in Fig. 20, where the parts are shown drawn practically to scale. By this means the edges 30 of the stile prevent the tube 36 from being forced out of the stile by the action of the springs, which bear against it, as hereinafter described. In other words, the edges 30 act as stops to limit the outward movement of the tube.

The tube 36 is held in place by the pivot 34, which passes through it, as shown in Figs. 15 and 20, and also by guide-pins 37 38, (best shown in Fig. 23,) said guide-pins being arranged near the upper and lower ends, respectively, of the tube 36. The guide-pins 37 38 are secured in the box 32, similarly to the pivot 34, reinforcing-blocks 39 being provided for securing said pins properly in position, as shown in Fig. 4. If desired, the pivot 34 and pins 37 38 may be made integral with the reinforcing-blocks, as shown at 35^a and 39^a in Fig. 23. Mounted upon the pivot 34 and pins 37 38 are springs 40, which bear against the box and the tube 36 and act to hold them yieldingly apart. As shown in Figs. 12 and 23, at the points where it receives the thrust of the springs 40 the tube is provided with a flattened portion 41 to form proper bearings for the ends of the springs, so that any tendency to rock on the part of the tube may be overcome. The arrangement and pro-

portions of the parts are such that the springs 40 serve normally to hold the tube 36 yieldingly in contact with the doubled-over edges 30 of the stile, as shown in Fig. 20, that portion of the tube 36 between said edges projecting through them forming a convex bearing-surface, which is adapted to engage the shoe or other surface, as hereinafter described.

Referring again to Fig. 15, 42 indicates the shoe, which is also, generally speaking, U-shaped, its ends 43 being doubled back, forming grooves 44, which extend parallel with the sides of the shoe. The length and width of the shoe 42 are substantially equal to the length and width of the stile, and the shoe is provided with a concavity or groove 45, which is adapted to receive and fit the projecting portion of the retaining-tube 36, as best shown in Fig. 20. The sides of the shoe 42 and their doubled-over ends 43 fit in the slides of the window-frame, forming bearings for the sash, as shown in Fig. 20. 46 indicates a plate having flanges 47 projecting at right angles thereto, forming substantially a channel-bar. Said plate 46 is adapted to fit in the shoe, its flanges 47 being adapted to fit in the grooves 44, as shown in Fig. 20. Said plate 46 serves not only to reinforce the shoe 42, but also as a means of securing the counterbalance-weights to the sash. To this end it is provided near its upper end with a bracket 48, having an eye 49, to which the sash-cords may be secured, as shown in Fig. 10. From the foregoing it will be seen that the plate 46 is fitted to the shoe 42 by sliding it endwise into said shoe in the same manner as the box 32 is fitted to the stile 28. The shoe is secured to the stile by the pivot 34, which, as best shown in Fig. 20, passes through the shoe and through a reinforcing-plate 50, secured to the plate 46 at the longitudinal center thereof. A nut 51, screwed upon the end of the pivot 34, serves to hold the parts together.

Fig. 20 illustrates the arrangement of the parts of the sash thus far described when assembled and in position in the window-frame.

From the foregoing description it will be seen that when the shoe and stile are in alinement the projecting portion of the tube 36 then lies in the concavity in the shoe, and the parts are held in such position by the action of the springs 40. The tubes 36 also form tight joints by their engagement with the shoe or other surface to exclude the weather. The sash may then be raised and lowered in the ordinary way. The sash may also be rocked upon its pivots 34 by either inward or outward pressure applied to one of the rails and may then be swung as illustrated in dotted lines in Fig. 2, the tube 36 moving back into the stile under the pressure applied to the rail, compressing the springs 40. The tube 36 under the action of the springs 40 automatically locks the stile and shoe in position as soon as they are returned to alinement.

The construction of the rails of the sash is shown in Figs. 2, 5, 6; and 7. As shown in Fig. 2, the bottom rail 52 of the lower sash is constructed of a single piece of metal bent to the proper shape and having its edges interlocked, as shown. At its ends the lower rail 52 is provided with projecting lips 53, which extend over the lower ends of the stiles, as best shown in Fig. 7. The lower rail 52 is secured to the stiles at its ends by rivets, as indicated in Fig. 7, or by other suitable means. The upper rail 53 of the lower sash is best shown in Figs. 2 and 5. Said rail is provided with a removable cover-plate 55, the edges of which are bent to form hooks 56, adapted to engage other hooks 57, carried at the upper edges of the rail, as shown in Fig. 5, the arrangement being such that the cover-plate 55 may be slid upon the rail by an endwise movement, and thereby locked thereto. The rail 54 is provided with inwardly-projecting flanges 58 59 at its under side, said flanges being spaced apart to form a slot to receive the window-pane 60. By this construction when the cover-plate 55 is removed the window-pane may be inserted in the sash, after which by attaching the cover-plate 55 the pane is fixedly secured in position. The ends of the top rail 54 are secured to the stiles by rivets or other suitable means. The ends of the cover-plate 55 project over the stiles, terminating over the edges 30 of said stiles, as best shown in Fig. 1. When the cover-plate is put in position, it is secured by a drop of solder or other suitable means.

The lower ends of the shoes are inclosed by providing them with a projecting lip 61, as shown in Fig. 11, said lip being bent at right angles, so that it projects under the lower ends of the flanges 47 of the plates 46, and is then riveted or otherwise secured in place.

62 indicates the lower rail of the upper sash, which is adapted to fit closely against the upper rail of the lower sash, as shown in Fig. 2. The rail 62 is preferably similar in shape to the upper rail 54, but it need not be provided with the removable cover-plate. The upper rail 63 of the upper sash is similar in general outline to the lower rail 52, but differs therefrom in having a removable cover-plate 64, which is similar to the cover-plate 55. Said rail is best shown in Fig. 2.

In assembling the parts and fitting the sash in position the plate 46 is fitted to the shoe 42 by sliding it endwise, so that its flanges 47 fit into the grooves 44 in the shoe. The parts of the stiles being assembled in the manner already described, the stiles are then secured to the shoes by the pivots 34 and are held in alinement therewith by the tubes 36. The sash-cords 65, which run over the usual pulleys in the frame, are then attached to the brackets 48. It will be understood that the brackets 48 are placed a somewhat-greater distance from the upper ends of the shoes than the pulleys 66 are from the upper ends of the slideways, so that the sash may rise to

the top of the window-frame. After the sash-cords are secured to the shoes they are fitted into the slideways and the top and bottom rails of the sash are secured to the stiles. The sash is then ready to receive the glass. To put the glass in position, the sash is turned upon its pivot to make the upper rail readily accessible. The glass is then slid endwise into the sash until it rests in its proper position, when the cover-plate 55 or 64, as the case may be, is put in position, thereby locking the glass in place and closing up the sash. By applying a small amount of solder to the cover-plate it is secured in position and prevented from becoming accidentally displaced.

In assembling the parts before the glass is put in place the stiles, with their shoes attached, are not sufficiently heavy to counterbalance the sash-weights, and therefore in order to hold the stiles and shoes in place each shoe is provided with a catch adapted to engage a part of the frame when the shoe is near its lowermost position and hold it down against the action of the weight. In Fig. 14 I have illustrated a spring-catch for this purpose, consisting of a hook 67, mounted on a pivot 68 in the shoe, the lower end of said hook being adapted to enter a recess 69 in the window-frame and engage one edge thereof, as shown in Fig. 14. A spring 70 bears against the upper end of said hook and operates to move the lower end or hooked portion thereof out of the recess 69. When the shoe is first fitted in the slideway, the lower portion of the hook 67 is moved by hand into engagement with the window-frame, the shoe then being a short distance above its lowermost position. After the glass has been put in position the shoe is released by moving it down to its lowermost position, when its hook will move out of engagement with the frame under the action of the spring 70, and inasmuch as said spring acts to hold the hook out of operative position it cannot again engage the window-frame. In Fig. 13 I have shown a different form of catch for the same purpose, consisting of an ear 71, formed in the shoe 42 and adapted to be bent outward to form a hook adapted to engage a part of the window-frame. With this construction the ear 71 is bent out by hand or by the use of a suitable tool to engage the window-frame, and afterward, when the glass has been put in place, it is bent back, thereby releasing the shoe from the window-frame.

In Figs. 16, 21, and 24 I have shown a modified form of stile and shoe. In the construction shown in said figures the stile proper is of the same construction shown in Fig. 15, being provided with the intumed edges 30 and the slots 31, as already described. Instead, however, of mounting the retaining-tube in the stile it is mounted in the shoe, as will be hereinafter described, the stile carrying in lieu thereof a plate 72, having inwardly-projecting edges 73, adapted to enter the slots 31, as best shown in Figs. 16 and 21.

The retaining-tube 36 is mounted in the shoe 74, which is similar in construction to the box 32, having inwardly - projecting edges or flanges 75, adapted to serve as stops to prevent the tube from moving out too far. The pivot 34 is carried in the shoe and is adapted to project through and be secured to the plate 72, thereby uniting the stile and shoe. The springs 40 are mounted in the shoe 74, as illustrated in Fig. 24. 76 indicates reinforcing-blocks in the shoe, and 77 similar blocks carried by the plate 72. Said blocks serve the same purpose as the blocks 35 and 50. The blocks 76, carried by the shoe, are mounted inside the shoe instead of outside, so as not to interfere with the bearing of the shoe in the slideway. Furthermore, the rivets 78, by which the blocks 76 are secured to the shoe, are countersunk into it, as shown in Fig. 18, for the same purpose. Where the shoe is of the construction shown in Fig. 16, it is provided with a longitudinal recess 79 near its upper end, in which is secured the sash-cord, as shown in Fig. 19. The operation of this modified form of construction just described is practically the same as the other, since the only substantial difference is that in one case the retaining-tube is carried by the stile and in the other it is carried by the shoe.

In Figs. 17 and 22 I have shown a still further modification, which is, however, practically the same thing as that just described, the only difference being that the shoe is designed to move in a slideway narrower than the stile. Consequently the shoe is made of less width than the stile, giving the design shown in Figs. 17 and 22.

By mounting the retaining tube or strip as above described and causing the operative portion thereof to project through a slot, as is the case in my improved construction, the use of adjusting devices to control the extent of projection of the strip is avoided. Furthermore, variation in the extent of projection of different parts of the strip is prevented, as the strip being uniform in diameter and the slot of uniform width throughout its length it is impossible that there should be any variation in the extent of projection of the strip. Furthermore, by my invention I provide an improved sash, the parts of which may readily be assembled and mounted in the window-frame before the glass is put in position and the glass afterward fitted and locked in place quickly and without difficulty. Furthermore, the parts of the sash and shoe being entirely of metal are perfectly suitable for fireproof construction. As already suggested, where the sash is not intended to slide, the strips 36 may be arranged to engage the window-frame.

I have described my invention in detail as illustrated, but wish it to be understood that my invention is not restricted to the specific details of construction or form or position of parts described, except in so far as they are particularly claimed.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a sash, of shoes at the side edges thereof, pivots supporting the sash in said shoes, a retaining device for normally holding said sash and shoes in alignment, consisting of a tube, springs normally holding said tube in operative position, and means limiting the extent to which said tube may move under the action of said springs, substantially as described.

2. The combination with a sash, of shoes adapted to fit against the stiles thereof, pivots connecting said shoes and stiles, whereby the sash may swing to an angular position with reference to said shoes, a retaining device between one of said stiles and the shoe adjacent thereto, said retaining device consisting of a tube carried by one of said members, as the stile, and adapted to project to engage the other of said members, as the shoe, to hold said members in alignment, springs for holding said tube normally in operative position, and means limiting the extent to which said tube may project, substantially as described.

3. The combination with a sash, of shoes adapted to fit against the stiles thereof, pivots connecting said stiles to said shoes, a retaining device carried in one of said members, as the stile, and adapted normally to hold said members in alignment, a slot through which said retaining device is adapted to project to engage the other member, and springs for projecting said retaining device through said slot, substantially as described.

4. The combination with a sash, of shoes adapted to fit against the stiles thereof, pivots connecting said stiles to said shoes, a retaining device carried in one of said members, as the stile, and adapted normally to hold said members in alignment, a slot through which said retaining device is adapted to project to engage the other member, said retaining device having a convex surface adapted to project through said slot, and springs for projecting said retaining device through said slot, substantially as described.

5. The combination with a sash, of shoes adapted to fit against the stiles thereof, pivots connecting said stiles to said shoes, a tubular retaining device carried in one of said members, as the stile, and adapted normally to hold said members in alignment, a slot through which said retaining device is adapted to project to engage the other member, and springs for projecting said retaining device through said slot, substantially as described.

6. The combination of a stile for window-sashes, having inturned edges spaced apart forming a narrow passage or slot, a tubular retaining device mounted in said slot, the diameter of said retaining device being somewhat greater than the width of said slot, means for yieldingly holding said retaining device in said slot, and a shoe pivoted to said slot and having a recess adapted to receive

the projecting portion of said retaining device, substantially as described.

7. The combination of a stile having a narrow slot, a retaining device having a convex portion adapted to project through said slot, means for yieldingly holding said retaining device in said slot, and a shoe having a recess adapted to receive the projecting portion of said retaining device, substantially as described.

8. The combination of a stile, a shoe adapted to fit against said stile and pivotally connected thereto, a retaining device carried in one of said members and adapted to project through a suitable slot in said member, to engage the other member and hold said members in alinement, and means for yieldingly holding said retaining device in said slot, substantially as described.

9. The combination of a stile having inturned edges 30, forming slots 31, a box 32 having inturned edges 33 adapted to fit into said slots 31, a tube 36 carried by said box 32, said tube being adapted to project between the inturned edges of the stile, springs for holding said tube 36 in operative position, a shoe pivotally connected to said stile, said shoe having a recess 45 adapted to receive the projecting portion of said tube 36 when the shoe and stile are in alinement, and means for attaching the shoe to the suspending device of the window-frame, substantially as described.

10. The combination of a stile having inturned edges 30 forming grooves 31, a box 32 having inturned edges 33 adapted to fit into said grooves 31, a tube 36 carried by said box 32, said tube being adapted to project between the inturned edges of the stile, springs for holding said tube 36 in operative position, a shoe pivotally connected to said stile, said shoe having a recess 45 adapted to receive the projecting portion of said tube 36 when the shoe and stile are in alinement, a plate 46 having flanges 47, and grooves 44 in said shoe adapted to receive said flanges 47, substantially as described.

11. The combination of a shoe, a stile pivotally secured thereto, means for normally holding said shoe and stile in alinement, and

a catch carried by said shoe and adapted to engage the window-frame, to prevent upward movement of said shoe while the parts are being assembled, substantially as described.

12. The combination of a shoe, a stile pivotally secured thereto, means for normally holding said shoe and stile in alinement, a hook carried by said shoe and adapted to engage the window-frame to prevent upward movement of said shoe while the parts are being assembled, and a spring for normally holding said hook out of operative position, substantially as described.

13. A stile for window-sashes having a narrow slot, a spring-pressed strip having a portion adapted to project through said slot, the extreme width of said strip being greater than that of said slot, and means for yieldingly holding said strip in said slot, substantially as described.

14. The combination with a pivoted sash and parts to which the sash is pivoted, of a spring-pressed strip carried in one of said members, as the stile, said member which carries the said strip being provided with a recess to receive the same, which recess has a slot through which the strip is adapted to project to engage the other member, substantially as described.

15. A stile for window-sashes having inturned edges spaced apart to form a narrow passage or slot, in combination with a spring-pressed strip located in said stile, the said strip being somewhat wider than the slot and adapted to project through the same, substantially as described.

16. The combination with a stile having inturned edges 30, forming slots 31, a box 32 having inturned edges 33, adapted to fit into said slots 31, and a spring-pressed strip located within said box, said strip being wider than the slot and being adapted to project through said slot between the inturned edges of the stile, substantially as described.

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