

No. 894,421.

PATENTED JULY 28, 1908.

E. G. BUDD.  
DOOR.

APPLICATION FILED JULY 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1,

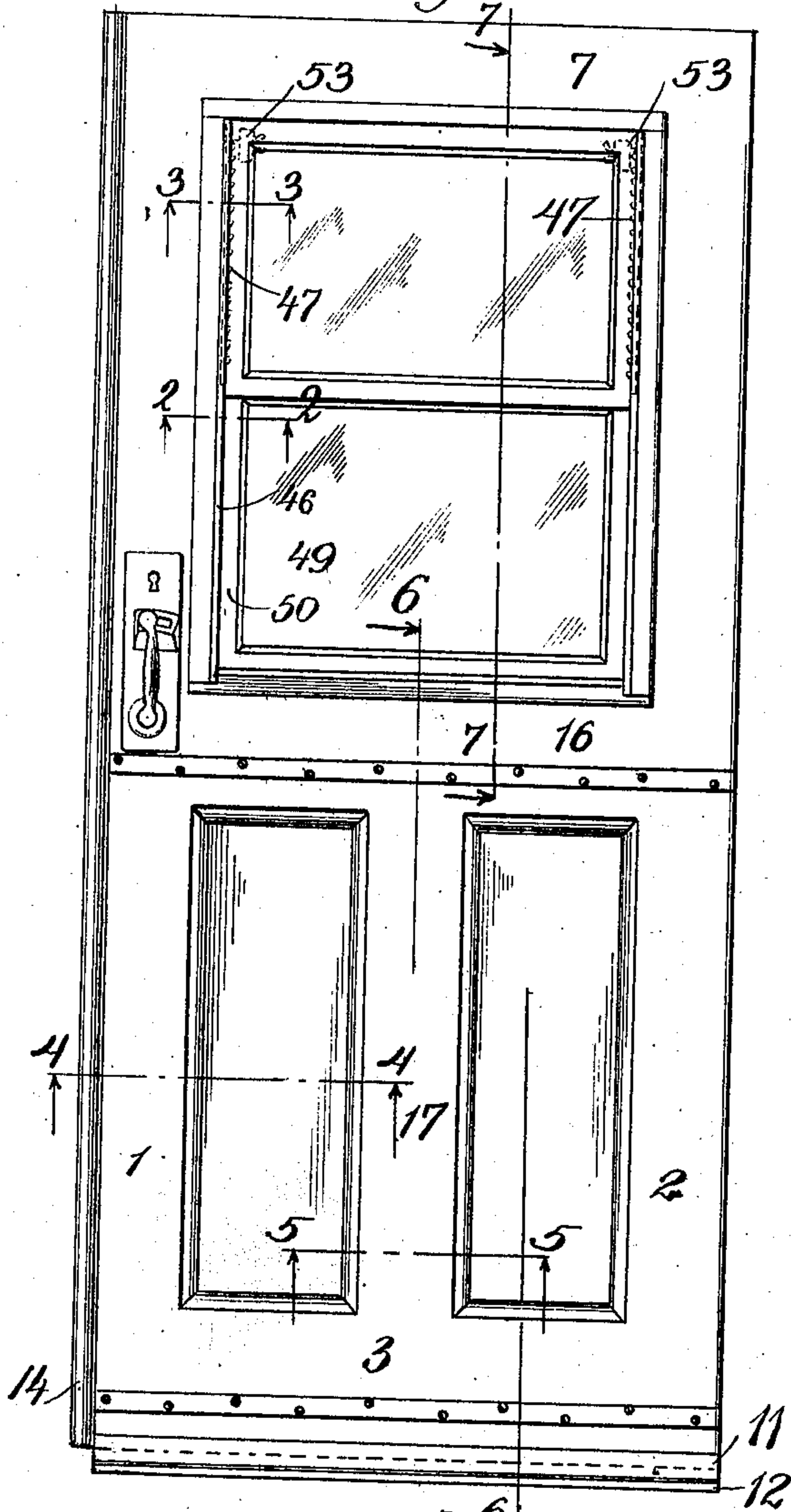


Fig. 2,

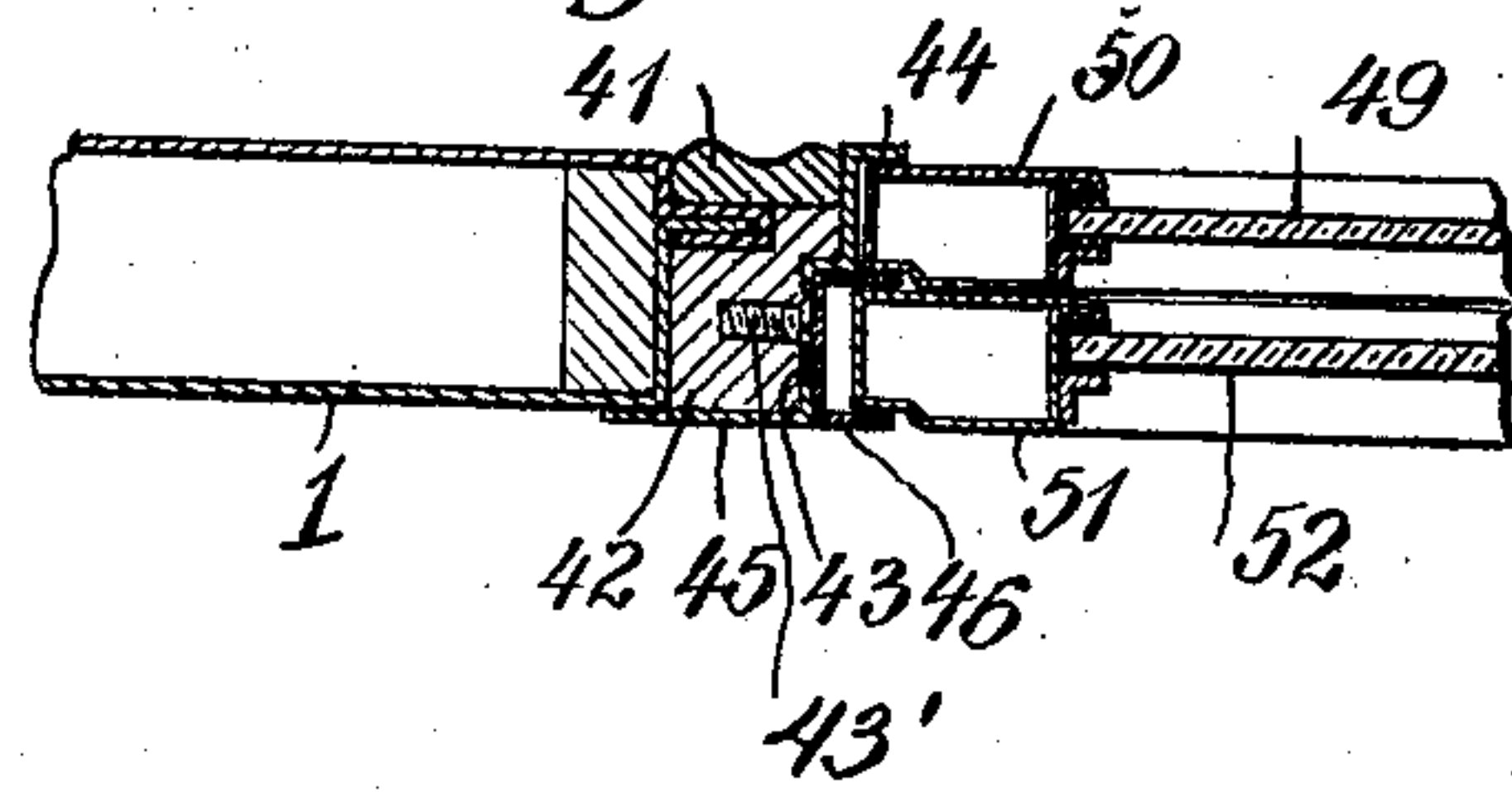


Fig. 3,

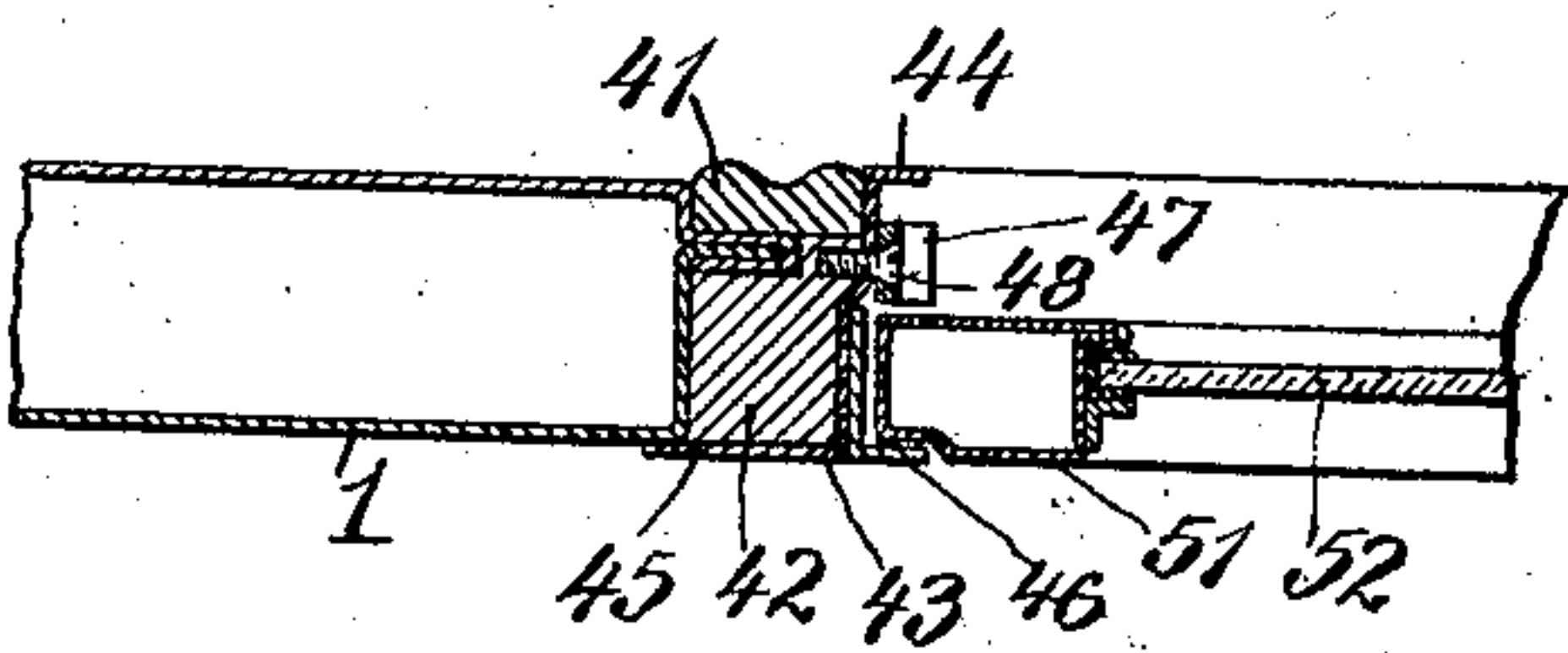


Fig. 4,

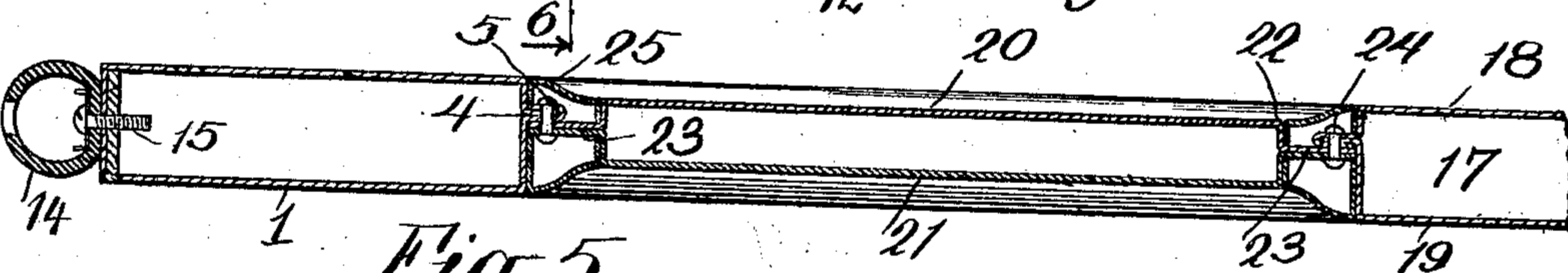
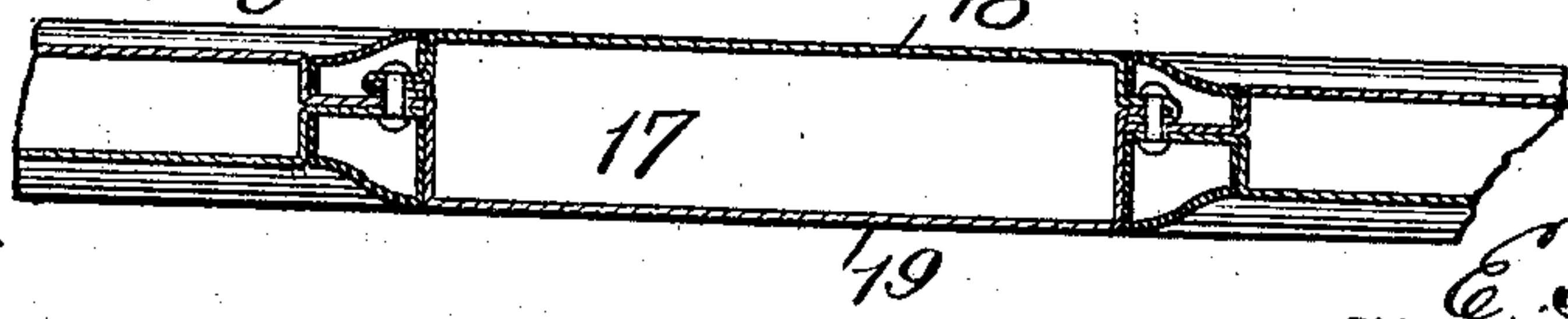


Fig. 5,



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2 SHEETS—SHEET 2.

Fig. 6,

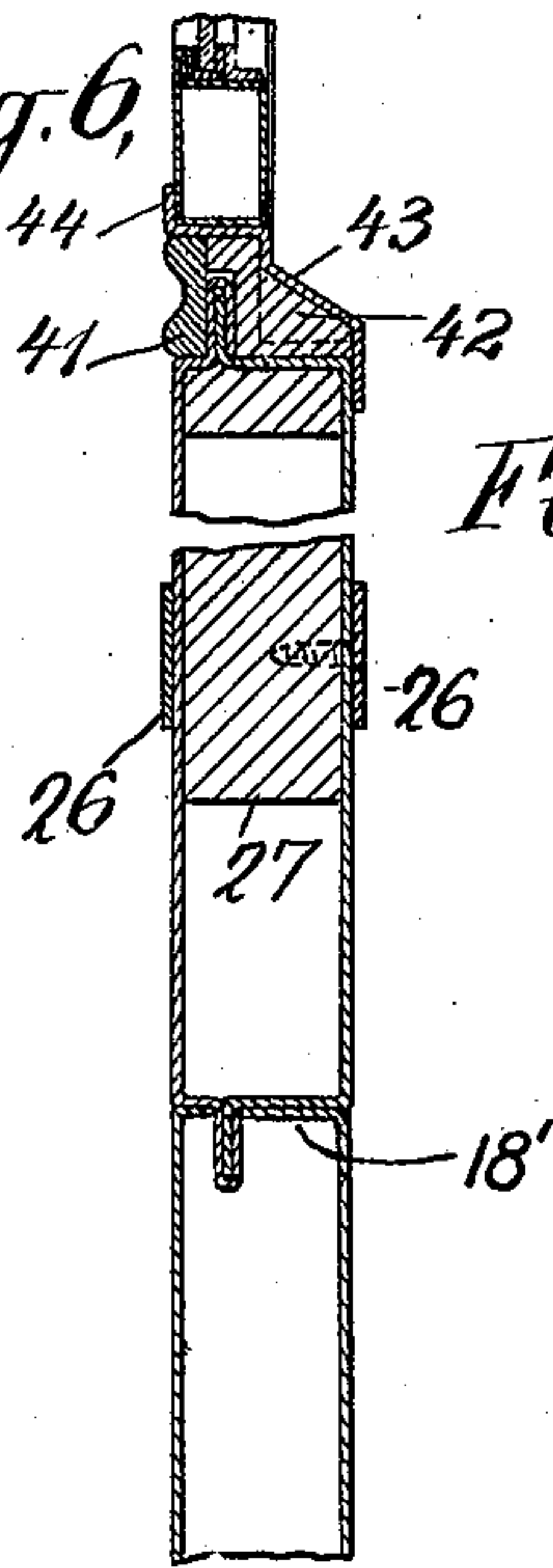


Fig. 7,

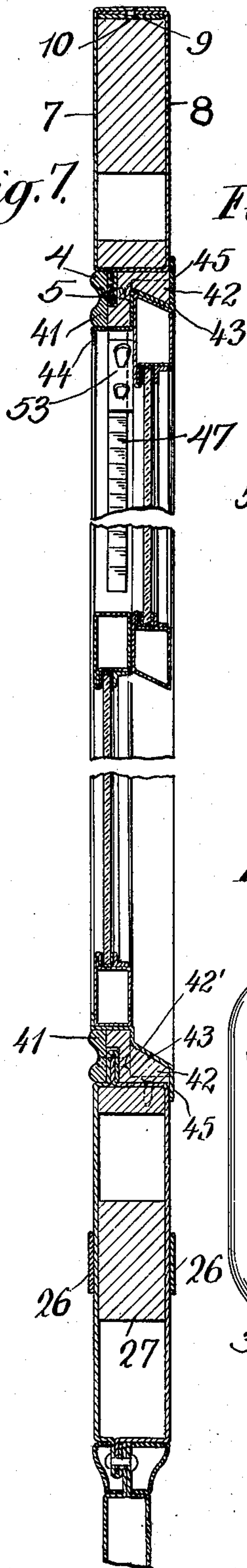


Fig. 8,

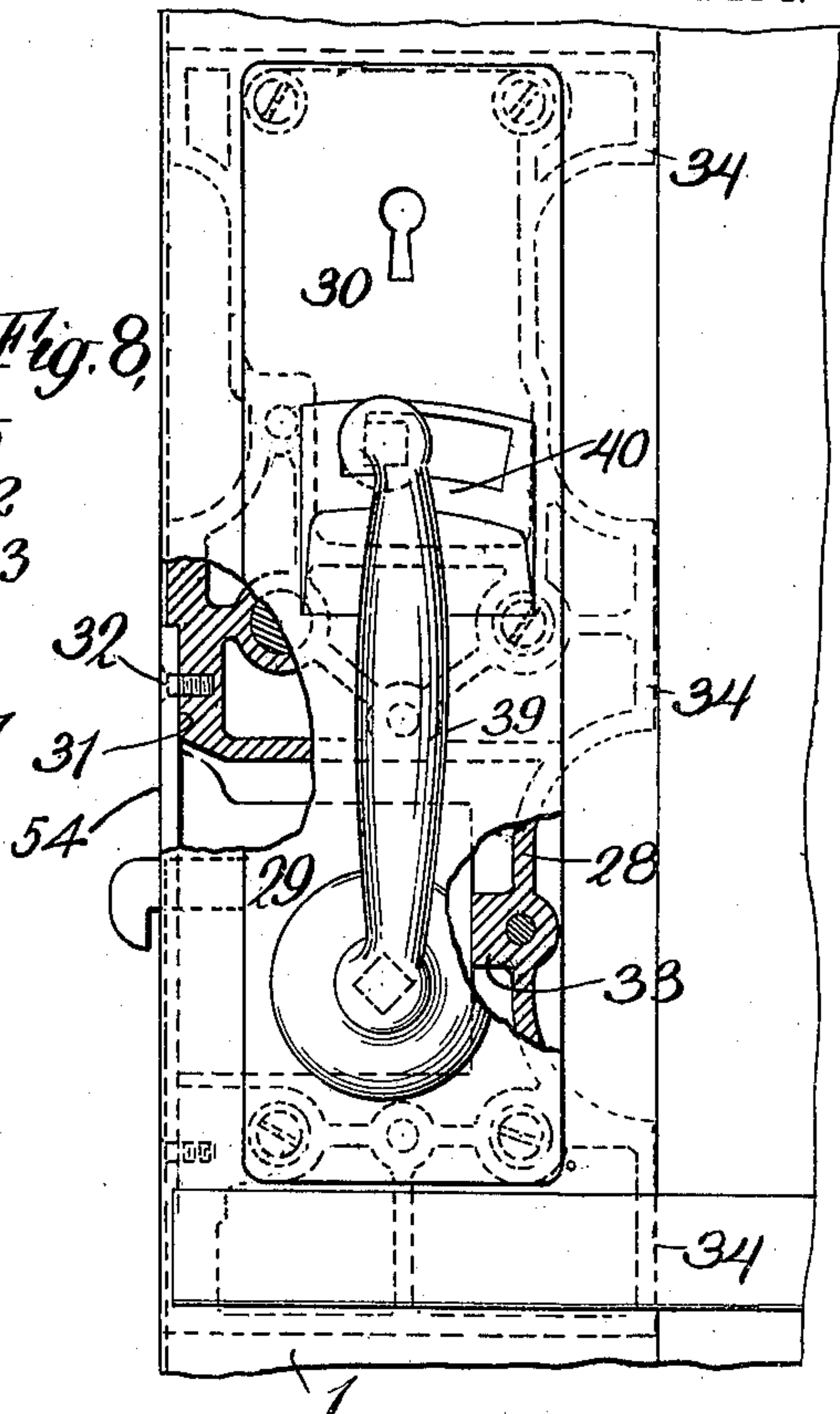
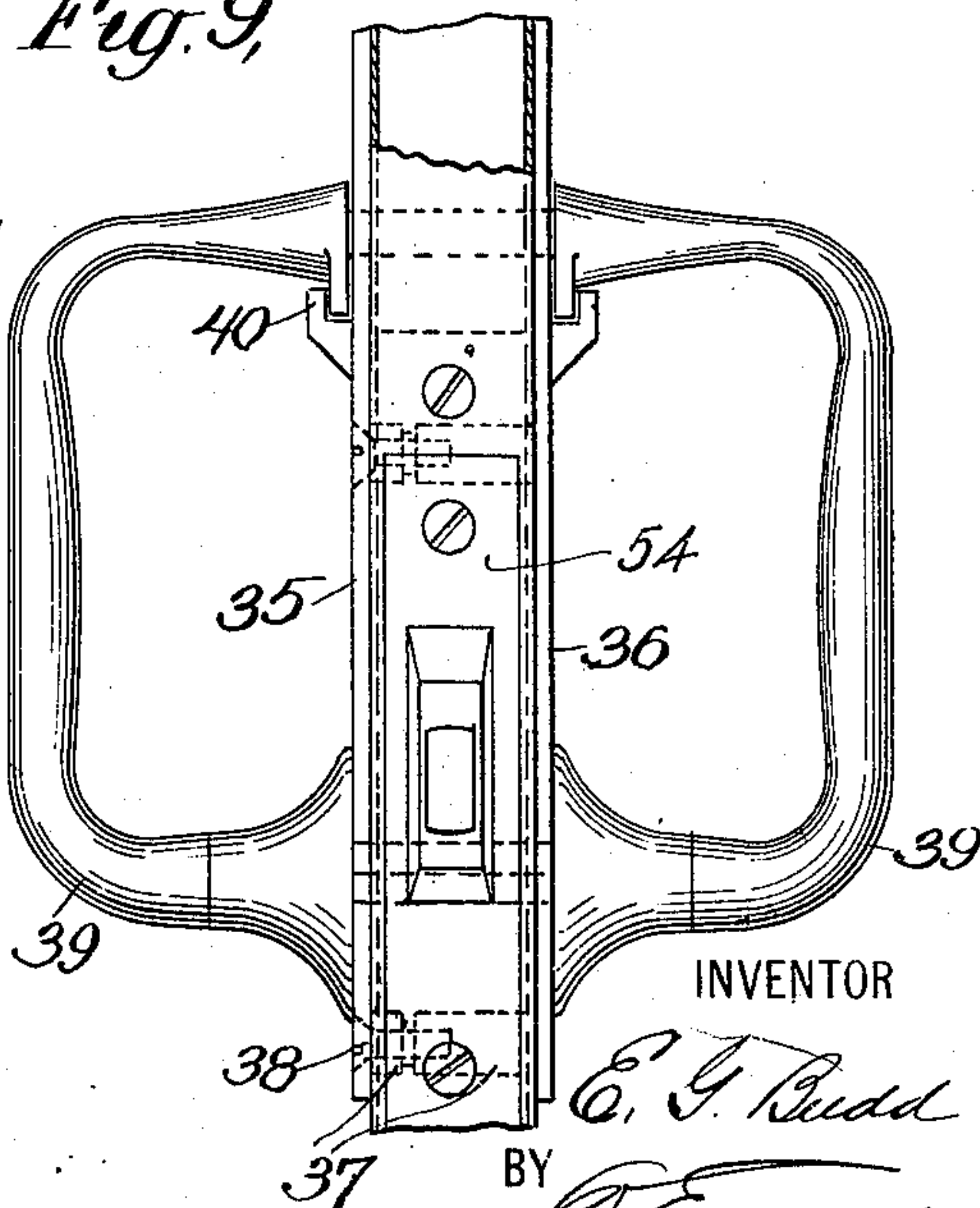


Fig. 9,



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# UNITED STATES PATENT OFFICE.

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## DOOR.

No. 894,421.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed July 11, 1907. Serial No. 383,161.

*To all whom it may concern:*

Be it known that I, EDWARD G. BUDD, a citizen of the United States, residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Doors, of which the following is a specification.

This invention relates to doors constructed largely of metal, so as to be practically fireproof.

The object of the invention is to effect certain improvements in the construction of such metallic doors, whereby great strength is obtained in a door which may be manufactured at comparatively low cost.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

Figure 1 is an elevation of the door; Figs. 2 and 3 are detail views in section on lines 2—2 and 3—3 of Fig. 1; Fig. 4 is a section on line 4—4 of Fig. 1; Fig. 5 is a section through the stile on line 5—5 of Fig. 1; Fig. 6 is a section on line 6—6 of Fig. 1; Fig. 7 is a section on line 7—7 of Fig. 1; Fig. 8 is a plan view of one of the rails, showing the lock and its supporting member broken away and sectioned in part; and Fig. 9 is an elevation of a portion of the edge of the door, showing the lock.

Referring to these drawings, the door consists of a rectangular frame formed of four rails secured together at their ends, one or more stiles lying within the frame and secured thereto, and one or more panels secured at their edges to the frame and stiles. The rails consist of sheet-metal strips which are pressed to the desired form, this being preferably a rectangular cross-section, so as to provide open space between opposite sides of the rail, whereby greater strength and a more attractive appearance are obtained, and an inwardly extending flange. They are preferably secured together at their ends by reducing the width of one rail at its end, inserting this reduced end within the end of the other rail and soldering or brazing together the overlapping surfaces. The construction of the side rails 1 and 2 and the bottom rail 3 is best shown in Figs. 4 and 6, from which it will be seen that the rail consists of a single piece of sheet-metal pressed to a rectangular cross-section as shown, and to provide a flange 4 at one of the lateral

edges and a fold 5 at the other lateral edge, this fold inclosing the flange 4 and forming therewith a flange extending inwardly of the frame. The top rail may be similarly constructed, but in some cases I prefer to make this rail as shown at the top of Fig. 7. As thus constructed, the rail consists of two strips 7 and 8 of sheet-metal pressed into form so that when assembled they provide a rectangular cross-section, the two strips being united at the inner edge of the rail by a flange 4 and fold 5, as above described in connection with Fig. 4. At the outer edge of the rail, each of the strips 7 and 8 is provided with a flange, one overlapping the other. A sheet-metal strip 9 is inserted within the rail directly underlying these overlapping flanges and the two flanges and the strip 9 are united by means of rivets 10.

The door illustrated in the drawings is preferably used as a side or end door for a railway-car, and for this purpose is arranged to slide back and forth. To facilitate this, I provide at the bottom of the door a guide adapted to coact with a suitable groove in the support for the door. This guide consists of a sheet-metal strip 11 (Fig. 6) pressed to a U-shaped cross-section and to provide at the bottom thereof an integral downwardly-extending flange 12. The sides of this U-shaped strip are adapted to lie one on either side of the bottom rail 3 at the lower edge thereof and are secured to rail 3 in any suitable manner, as by means of screws 13. These screws 13 may engage metallic strips inside the rail 3 or strips of wood or other suitable material within the rail and serving to prevent denting of the rail. The forward edge of the door may be provided with a suitable buffer 14 (Fig. 4) of rubber or other tubing secured to the edge of the door by means of screws 15 coacting with a strip lying within the rail 1.

Extending between the rails 1 and 2 and secured at its ends thereto, is a stile 16, and a similar stile 17 extends between and is secured to stile 16 and the bottom rail 3. The construction of these stiles is shown in Figs. 5 and 6. Each consists of two sheet-metal strips 18 and 19, pressed to provide flanges and inclosing folds at the lateral edges, whereby the two strips are secured together, and so bent intermediate these flanges and folds as to provide open space between the opposite sides of the stile. The extreme ends



of the strips 18 and 19 are turned at a right angle to the body portions of the strips as shown at 18' (Fig. 6) and the edges of these ends abut the flanges at the lateral edges of the rails. The slight depressions at the joints between the ends of the stiles and the rails may be filled with solder. In the spaces between the stiles 16 and 17 and the rails 1, 2 and 3, are secured suitable panels. Each of these panels consists of two pieces 20 and 21 (Figs. 4, 5 and 6) of sheet-metal pressed to provide a rib 22 parallel to each of the lateral edges of the piece and an outwardly extending flange 23 beyond this rib. The flanges 23 of the two pieces 20 and 21 are secured by means of rivets 24 to the flanges at the edges of the rails and stiles. These rivets serve to stiffen the side rails by preventing twisting which would take place if the edges of the rails were free to slide one upon another and also secure the panels firmly to the rails and stiles and thereby reduce vibration; furthermore, these panels serve as gussets to reinforce the devices for securing the ends of the rails together, and to thus strengthen the door and prevent sagging. In order to conceal the rivets by which the panels are secured to the flanges on the rails, I provide moldings 25, each consisting of a strip of sheet-metal which may be pressed to any desired cross-sectional shape. These molding-strips are secured in position by springing the lateral edges thereof between the ribs 22 on the plates of the panels and the inner edges of the rails adjacent to these ribs. If desired, the strips 25 may be secured more firmly in these positions by means of solder. To guide the door in its movement, I provide friction-strips 26 (Fig. 7) secured to the outside of the door, and in order that these may be held firmly in position I employ a securing piece within the door. This securing piece may be a strip of sheet-metal but I prefer to use a strip of wood 27 of such size that it fits tightly within the stile 16. The securing devices for friction-strips 26 pass through the stile 16 and enter the strips 27.

It is customary to provide doors of this type with locks and these locks are frequently subjected to sudden and severe strains. For this reason the mounting of the locks is of great importance, since these strains may tear the lock from the door or damage the door. I therefore provide means for holding the lock securely and for distributing the strains received by the lock over a substantial portion of the door. A lock-supporting member 28 is shown in Figs. 8 and 9 consisting of a casting cut to the interior dimensions of the rail 1 so as to fit snugly therein. This casting is cored out as shown in Fig. 8 so as to be of very light weight and is provided with two cavities to receive the locks 29 and 30. The member 28 is inserted within the rail 1 when the latter is being

made and a slot is cut in the edge of the rail the exact size of the front-plate 54 of the lock 29, as shown in Fig. 9. Member 28 has ledges 31 formed thereon and when the lock 29 is inserted in position, the ends of the front-plate 54 of the lock rest on these ledges and are secured thereto by screws 32, the surface of plate 54 lying flush with the surface of the edge of rail 1. The cavity in member 28 in which lock 29 fits is somewhat larger than the lock and at the rear thereof a lug 33 is formed on member 28 of such size that when the lock is in position it rests against this lug. The member 28 has integral lugs 34 thereon distributed along the opposite edges and these bear against the rail 1 so that any strains to which the lock 29 is subjected, as when the door is slammed shut, are transmitted to the member 28 and by it to the rail and door at a plurality of distributed points. With the locks in position, two escutcheon-plates 35 and 36 are positioned on opposite sides of rail 1 over the member 28. These plates have integral bosses 37 formed on the inner sides thereof which enter openings in the rail 1 and the member 28. Screws 38 are then inserted through openings in the bosses on the plate 35 and their ends screwed into threaded openings in the ends of the bosses on plate 36. The plates are thus securely held in position upon the door. The handles 39 are then positioned and secured together as shown, these handles having projections thereon coacting with tongues 40 formed on the plates 35 and 36.

The panel in the upper portion of the door is preferably of glass. In the drawings, I have shown two small windows mounted in the upper portion of the frame, the lower one being stationary and the upper one movable from the position in which it is shown in Fig. 1 to a position in which it overlies the lower window. A window frame is secured to the rails and central stile of the door and coacts with the window-sashes to support the two windows and permit movement of the upper one. Secured to the inwardly extending flange on each of the side and top rails and the central stile are two metal pieces 41 and 42, the latter being cut away on its inner side to receive the flange, as shown in Figs. 2, 3, 6 and 7. The piece 42 has depressions formed therein, as shown by the dotted lines in Fig. 7, and from the bottom of each of these depressions, a screw 42' extends through the piece and the flange on the frame and enters a threaded opening in the piece 41, thus securing the two pieces together and to the flange. The preferred cross-sectional shape of the pieces 42 at the top and bottom of the opening for the windows is shown in Fig. 7 and that for the pieces at the sides in Fig. 2. A strip 43 of sheet-metal pressed to the proper cross-section



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tional shape is then secured to each pair of pieces 41 and 42 by countersunk screws 43' (Fig. 2). Each strip 43 has a flange 44 at one edge and at the other a flange 45 overlying the side of the piece 42. A strip 46 of sheet-metal is then secured, as by means of suitable screws, to each of the strips 43 at the sides of the opening. The lower half of each of the strips 46 is of U-shaped cross-section (Fig. 2), but throughout the upper half each strip has one side cut away (Fig. 3) and adjacent thereto a rack 47 is secured to the piece 42 by screws 48. The sides of the U-shaped strips 46, together with the racks 47, form guides to position the upper window and permit movement thereof. The lower stationary window consisting of a glass 49 and sash 50 is positioned between the flange 44 on strip 43 and the adjacent side of the strip 46. The upper window consisting of the sash 51 and glass 52 is positioned as above described and movable in the side guides, its upper and lower edges being adapted to abut the strips 43 at the upper and lower edges of the opening in the door, as shown in Fig. 7. The sash 51 has latches 53 secured thereto and adapted to coact with the racks 47 to hold the movable window in any position to which it is moved.

Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:—

1. A door comprising a frame formed of rails secured together at their ends, said rails consisting of sheet-metal strips pressed to rectangular cross-section and having flanges extending inwardly of the frame, a panel formed of sheet-metal having its edges riveted to said flanges, said panel having a rib therein adjacent to the lateral edges, and sheet-metal strips overlying said rivets and held in position by said rib and the inner edge of the adjacent rail, substantially as set forth.

2. A door comprising a frame formed of sheet-metal rails secured together at their ends, a sheet-metal stile extending across the frame and secured at its ends to opposite rails, a strip within said stile extending lengthwise thereof, and a strip secured upon the exterior of the door lengthwise of said stile by securing devices coacting with said first-named strip, substantially as set forth.

3. A door having a frame consisting of hollow rails secured together at their ends, a supporting member inclosed within one of said rails and filling the same throughout a portion of the length of said rail intermediate its ends, and a lock positioned by said member, substantially as set forth.

4. A door having a frame consisting of hollow rails secured together at their ends, a supporting member inclosed within one of said rails and filling the same throughout a portion of the length of said rail intermediate

its ends, and a lock mounted on said rail, said member serving to distribute along the rail the force of shocks received by said lock, substantially as set forth.

5. A door having a frame consisting of hollow metallic rails secured together at their ends, a supporting member within one of said rails, and a lock secured to said member, said member having a seat against which the rear edge of said lock abuts, substantially as set forth.

6. In a door, the combination of a frame consisting of hollow metallic rails secured together at their ends, a metallic supporting member fitting within one of said rails and having a cavity therein, a lock in said cavity and secured to said member, its forward edge projecting through a slot in the edge of said rail, said member having a seat against which the rearward edge of said lock abuts, and metallic plates lying on opposite sides of said rail and secured together, substantially as set forth.

7. A door having a frame consisting of hollow rails secured together at their ends, a metallic supporting member within one of said rails, its width and thickness being substantially equal to the interior dimensions of the rail, said member having a cavity therein, and a lock in said cavity supported by said member, substantially as set forth.

8. A door having a frame consisting of hollow rails secured together at their ends, a metallic supporting member within one of said rails, its width and thickness being substantially equal to the interior dimensions of the rail, said member having a lock-receiving cavity therein and being of skeleton form so as to be of light weight, and a lock in said cavity supported by said member, substantially as set forth.

9. In a door, the combination of hollow metallic rails secured together, a metallic supporting member within one of said rails having a cavity therein, and a lock in said cavity supported on said member, its forward edge projecting through a slot in the edge of said rail, said member having a seat against which the rearward edge of the lock abuts and ledges against which the ends of the front plate of the lock rest, substantially as set forth.

10. In a door, the combination of a frame having an opening therein formed of frame-members of pressed sheet-metal, each provided with an inwardly extending flange, a window-frame consisting of metallic strips extending lengthwise of and secured to said flanges, a sash consisting of sheet-metal strips pressed into form and secured together at their ends mounted on said frame, and a window secured within said sash, substantially as set forth.

11. In a door, the combination of a frame having an opening therein formed of frame-



members of pressed sheet-metal, each provided with an inwardly extending flange, a window - frame comprising two metallic pieces secured to each of said flanges and  
5 sheet-metal strips secured to said pieces, and a window supported by said frame, substantially as set forth.

12. In a door, the combination of a frame having an opening therein formed of frame-  
10 members of pressed sheet-metal, each provided with an inwardly extending flange, a window - frame comprising two metallic pieces lying one on either side of each of  
15 said flanges, means passing through the flanges for securing said pieces together and to the flanges and sheet-metal strips overlying and secured to said pieces, and a window supported by said frame, substantially as set forth.

20 13. In a door, the combination of a frame having an opening therein formed of frame-members of pressed sheet-metal, a window-frame secured to said members and including

pressed sheet-metal strips flanged at their edges and sheet-metal strips of U-shaped  
25 cross-section secured to said first-named strips, and a window supported on said frame, substantially as set forth.

14. In a door, the combination of a frame having an opening therein formed of frame-  
30 members of pressed sheet-metal each provided with an inwardly extending flange, a window-frame comprising two metallic pieces secured to each of said flanges, sheet-metal strips overlying and secured to said  
35 pieces and sheet-metal strips of U-shaped cross-section secured to said first-named strips, and two windows supported by said frame, substantially as set forth.

This specification signed and witnessed  
40 this 8th day of July, 1907.

EDWARD G. BUDD.

Witnesses:

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P. J. TUCKER.