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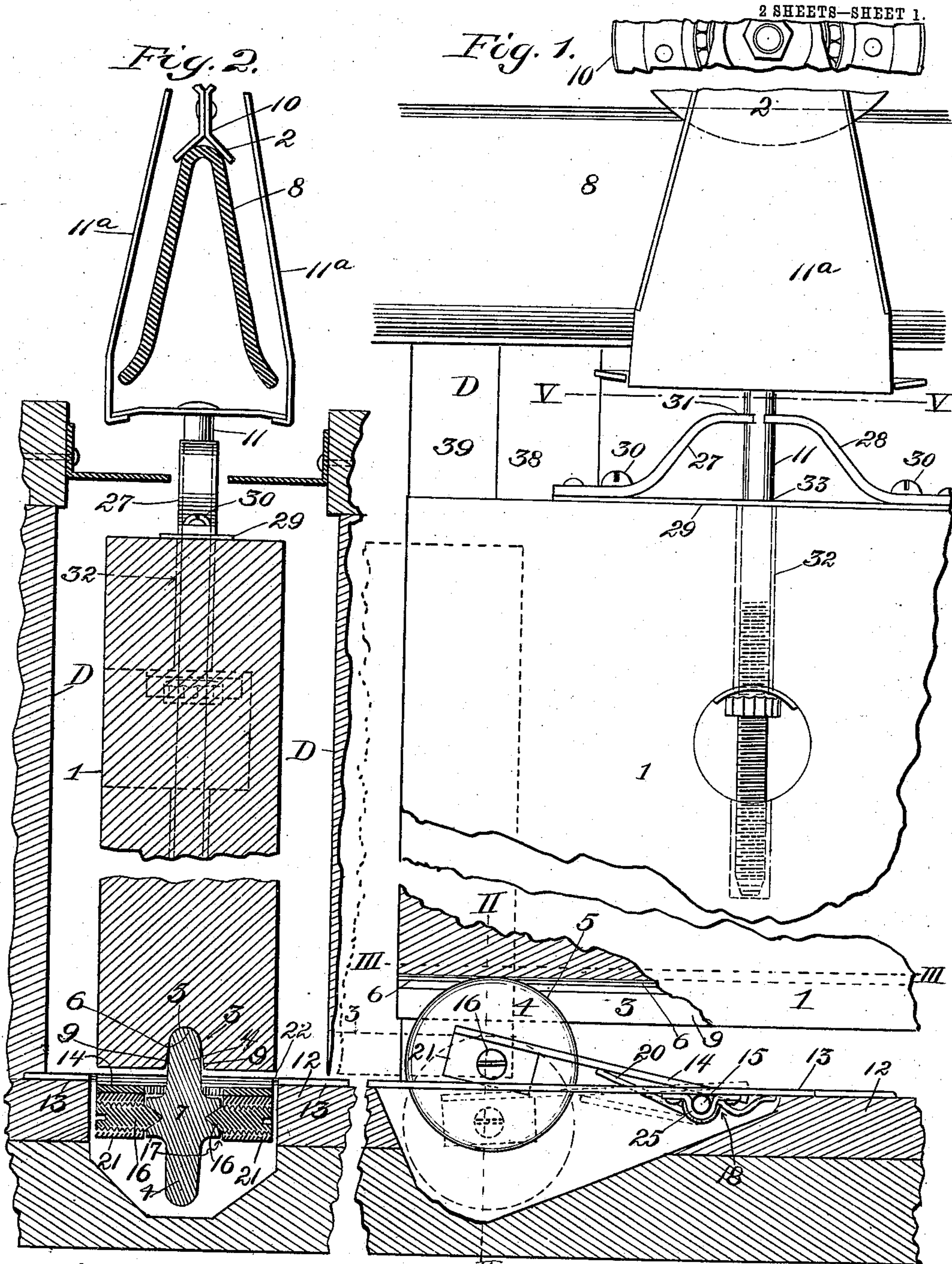
PATENTED OCT. 8, 1907.

D. SCHUYLER.

DOOR HANGER AND ROLLER SUPPORT FOR EDGEWISE MOVABLE DOORS.

APPLICATION FILED FEB. 18, 1905.

2 SHEETS—SHEET 1.



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Fig. 5. 30 27 11 33 31 29 28 30

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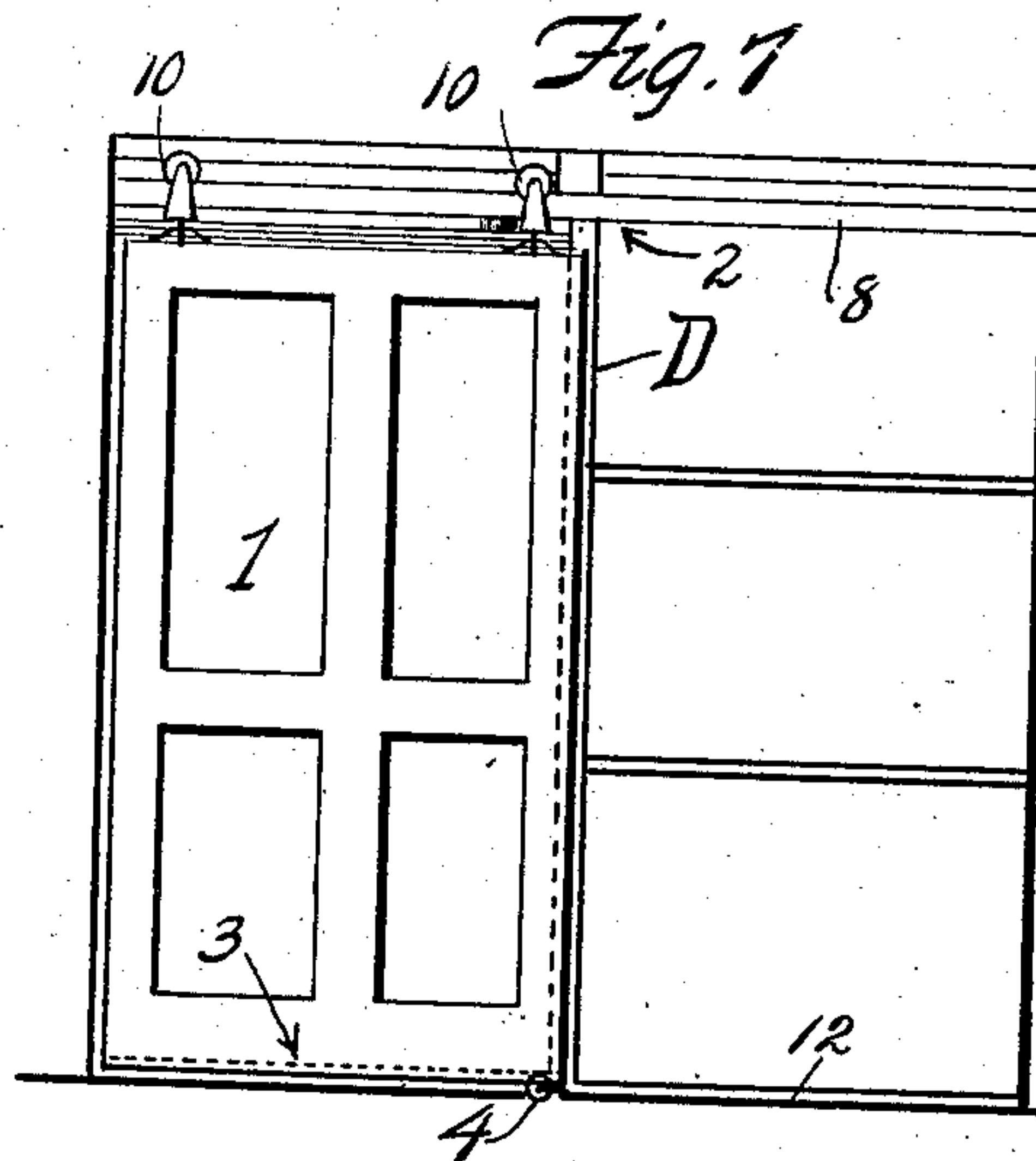
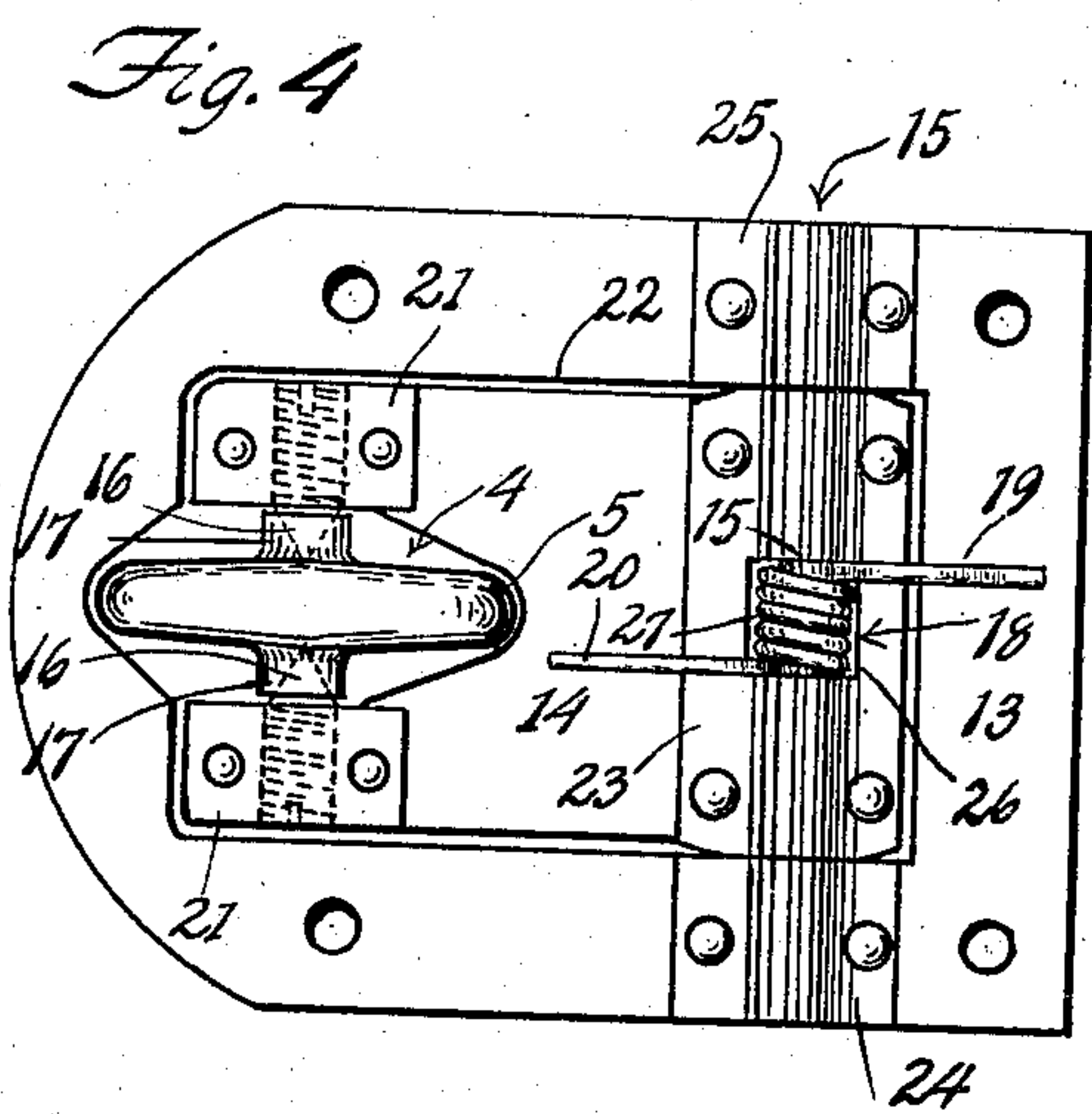
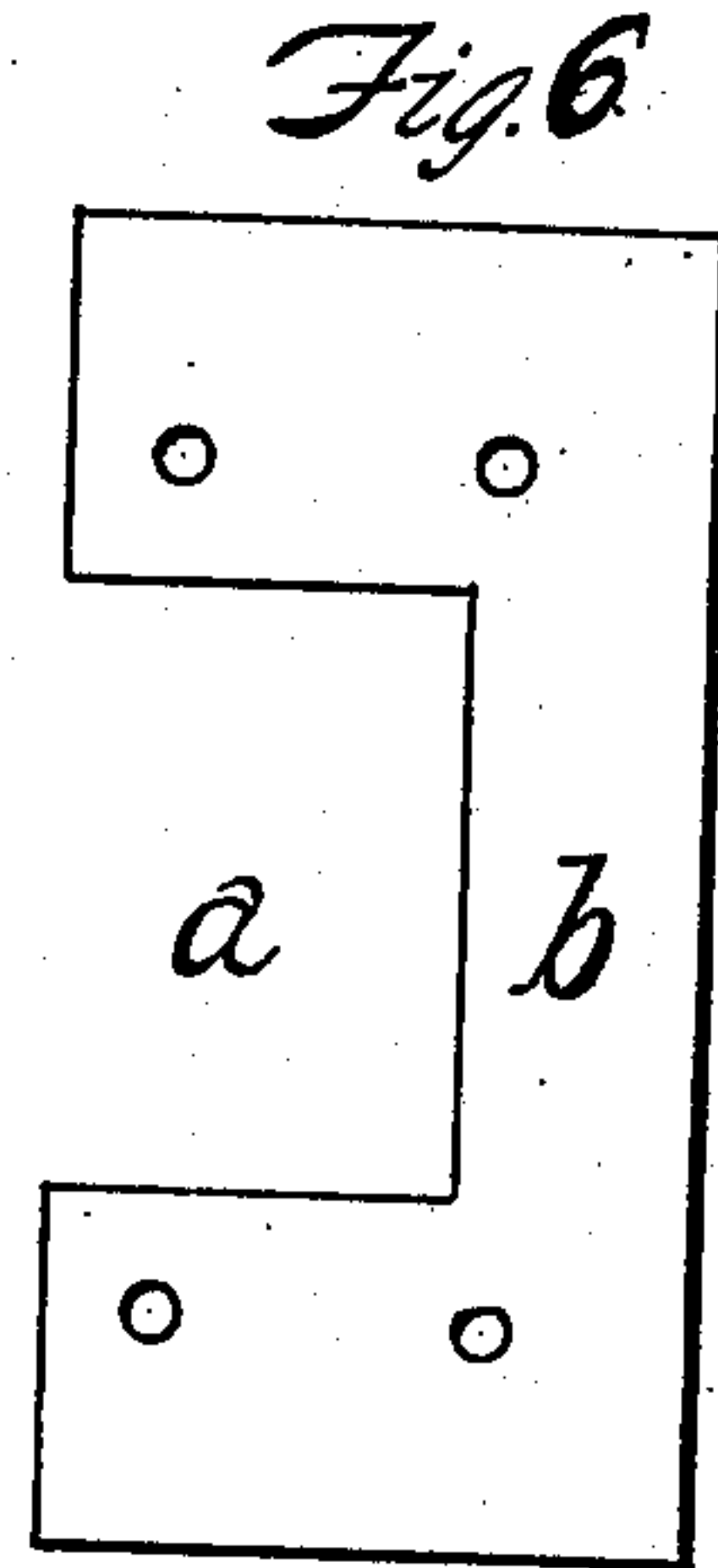
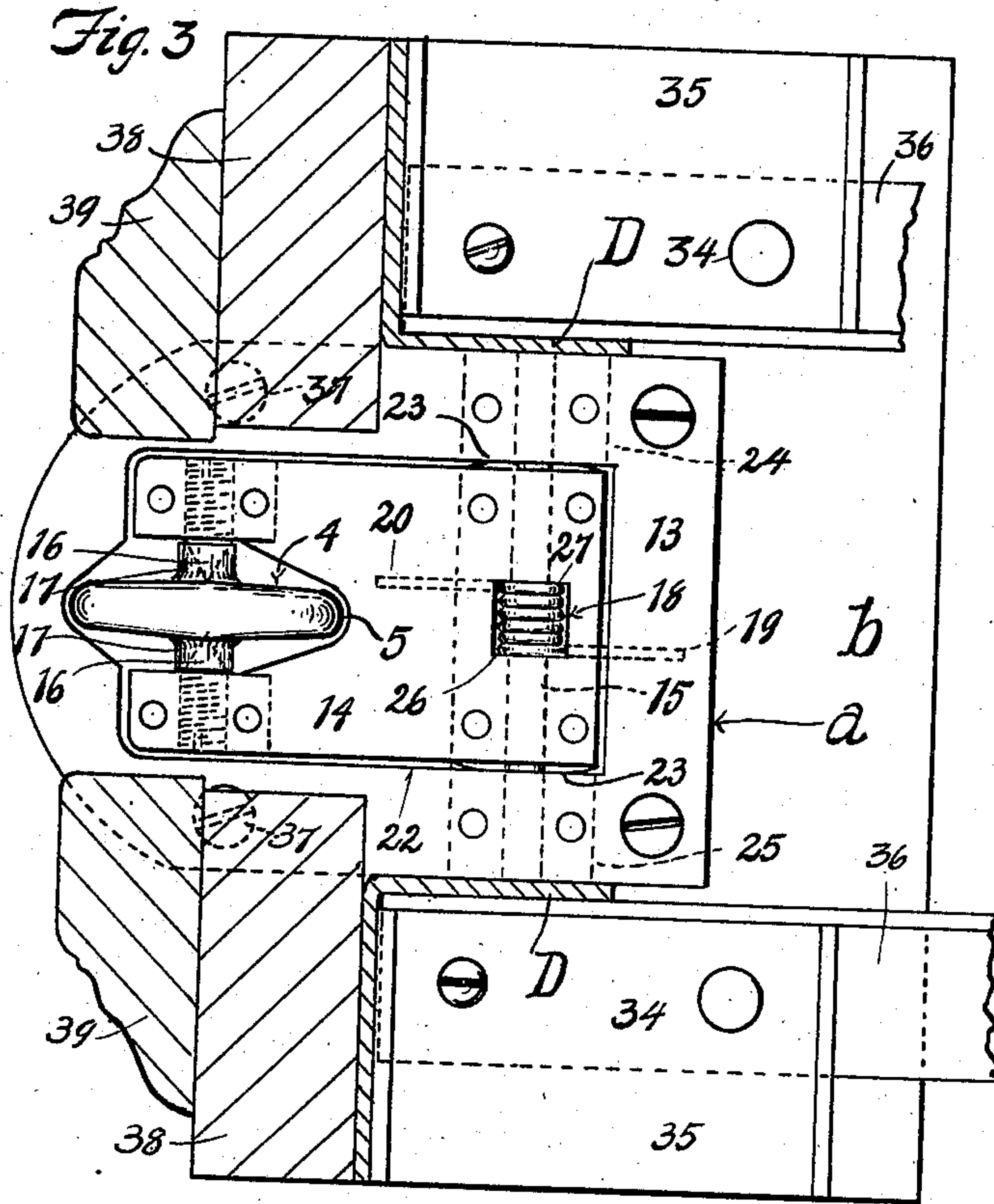
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

DANIEL SCHUYLER, OF SAN DIEGO, CALIFORNIA, ASSIGNOR TO THE PERFECT SLIDING DOOR COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

DOOR-HANGER AND ROLLER-SUPPORT FOR EDGEWISE-MOVABLE DOORS.

No. 867,612.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed February 18, 1905. Serial No. 246,325.

To all whom it may concern:

Be it known that I, DANIEL SCHUYLER, a citizen of the United States, and a resident of San Diego, in the county of San Diego and State of California, temporarily residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented new and useful Door-Hangers and Roller-Supports for Edgewise-Movable Doors, of which the following is a specification.

10 While this invention relates primarily to so called sliding doors, it also relates to guides for other movable bodies as well as for sliding closures and other edgewise moving closures, and includes the combinations and parts hereinafter particularly described and claimed.

15 An object of this invention is to provide a superior guiding means for edgewise-moving closures, which will hold the door from vibrating, will be practically frictionless and noiseless, and dispenses with the use of any rail in the threshold of the opening closed by such
20 closure.

An object of this invention is to provide means adapted for use in the system known as the perfect sliding door system to give to the closures of such system superior stability and freedom from vibration or
25 lateral movement at all times; but the use of the invention is not limited to any specific system or kind of edgewise movable closure.

This invention relates to a self adjusting, steadying, centering, noiseless, roller guide for sliding doors and
30 the like. The invention is capable of application in various forms.

One object of this invention is so to construct the roller and the groove, that the roller can move along the groove or the grooved body along the roller with
35 practically no rubbing or slipping between the roller and the body. This object is attained in cases where the grooved body is stationary and the roller moves along the groove, as well as in cases where the grooved body is movable and the roller stationary.

40 The invention includes a suspended movable body grooved below the point of suspension and a roller mounted on a horizontal axis and having a portion of its rim in the groove of said body.

45 Another object of the invention is to provide a simple, cheap, strong and permanent roller guide for sliding doors and to provide for keeping the roller thereof and the object to be guided in constant contact.

50 Another object of the invention is to so construct the various parts as to facilitate accurate assemblage of the parts of the roller guide and also for locating the roller guide with unfailing accuracy in the floor so as to center and give true direction to the bottom of the closure.

55 Another object is to provide a simple, easily assembled, adjustable roller guide to be stationed in the wall pocket for sliding doors and which will follow the rise

and fall of the door and will be free from liability to squeak or creak, without lubrication, but which can be readily lubricated if desired.

Another object of the invention is to so suspend and mount the so called sliding door closure as to prevent
60 any superfluous movement of the closure so that in actual practice the closure can be moved rapidly and without care in opening and closing it and yet will move with a velvet smoothness.

A further object of the invention is to provide means
6 for causing a sliding door invariably to enter its true seat at the final movement of closing.

Another object is to facilitate accurate mounting of the closure.

The accompanying drawings illustrate the invention in the form at present deemed to be most desirable.

Figure 1 is a fragmental side elevation showing the invention as applied to a gravity closing door. The door is shown in its open position. Dotted lines show the positions of parts when the door is closed. Fig. 2
75 is a vertical section lengthwise the axis of the roller on line II—II, Fig. 1. The parts are shown in the position they occupy when the door is closed. Fig. 3 is a sectional plan on line III—III, Fig. 1, the closure being omitted from the view. Fig. 4 is an inverted
80 view of the roller guide detached. Fig. 5 is a plan of the brace from line V—V Fig. 1 omitting the bolt 11. Fig. 6 is a reduced plan of the anchor plate. Fig. 7 is an elevation of my newly invented sliding door; parts being omitted for clearness of illustration.

85 1 designates the suspended closure or door having below its point of suspension, 2 a longitudinal groove 3 extending horizontally along the path of the movement of the door on the track rail 8, from which it is suspended. A roller or wheel 4 located beneath the
90 door and mounted on a horizontally disposed axis and having its rim 5 curved in cross section, is seated in said groove and engages the intermediate face 6 thereof. The axis 7 of the roller 4 lies in a plane at right angles to the groove 3 and to the path of movement of the
95 body 1.

The contour of the curved portion of the roller rim 5 conforms in its radial sections to the cross sectional curved portion of the contour of the bottom or intermediate face 6 of the groove. The outer rim 5 of the
100 roller and the intermediate face 6 of the groove shown in Fig. 2 are tapering or curved in the arcs of circles approximately of the same radius so that the rim of the roller fits into the transversely curved face 6. The walls 9 of the groove converge from the mouth of the
105 groove toward the intermediate face 6 and the roller is thinner than the width of the space between said side walls 9 so that its contact with the body is only on the intermediate face 6 at the line which lies in the vertical plane in which the axis of the roller lies. By
110

this arrangement the roller may fit the groove so closely as to prevent lateral movement of the closure and yet there will be no rubbing or grinding of the roller on the closure. In order to prevent the roller from riding out of the groove, the groove terminates at its mouth in the nearly vertical inwardly converging walls 9.

10 indicates the rollers by which the closure is sustained, 11 and 11^a, the suspension bolt and hanger arms connecting the closure with said rollers.

12 is the floor; 13 a perforated plate fastened to the floor and forming a frame in which a carrier 14 is pivoted by a shaft 15. The guide roller 4 is mounted on the carrier, preferably by center pivots 16 of case hardened steel in the ends of the hub 17 of the roller which is desirably made of cast-iron so that the bearing between it and the pivots will be anti-friction, preventing noise or squeaking.

18 is a spring, constituting means for yieldingly holding the roller toward the body 1. The spring is preferably a coil spring surrounding the shaft 15 and having its terminals 19 and 20 engaging the frame and the carrier respectively so that the tension of the spring is applied through the carrier to hold the roller in constant yielding contact with the inner face of the groove. The pivots 16 for the roller are desirably mounted by being screwed through blocks 21 on the free end of the carrier, and the shaft 15 is arranged cross-wise of the groove and rearward of the axis of the roller so that a considerable up and down movement of the roller may occur without much movement of the carrier on its support formed by the shaft; the object of this being to allow the guide roller to follow the closure in any vertical movement it may make in its travel. That is to say, this especially adapts the guide roller for application to gravity closing doors in which the closure rises as it opens and falls as it closes. The solid and dotted positions shown in Fig. 1 suggest the up and down movement of the closure.

Desirably the carrier and its frame are formed of sheet metal of a thickness suitable to give the required strength and both may be stamped from a single plate; the carrier being formed of the portion struck out of said plate to provide the opening 22 in which the carrier is to be mounted, so that the carrier may freely swing on its shaft up and down from upper to lower side of the frame.

23 is a bearing plate fastened on one face of the carrier to secure the shaft 15 thereto, and 24 and 25 are bearing plates fastened to the frame to secure the ends of the shaft 15 thereto. Desirably the bearing plate 23 is equal in length to the width of the opening in the frame so as to engage with the walls of said opening to hold the carrier in true position.

The carrier and the bearing plate 23 are provided with a centrally arranged hole 26, and the spring 18 has its coil 27 equal in width to the length of the hole so that in assembling the parts after the carrier and its bearing plate 23 have been riveted together, and the frame and its bearing plates have been riveted together, the workman desiring to assemble the roller guide will bring the coil of the spring into the hole 26, and the shaft receiving openings of the bearing plates on the frame and the carrier into line to receive the shaft which will then be driven through into place.

In putting the roller guide into place in the door struc-

ture, the frame 13 will be inserted into the opening *a* in the anchor plate *b* (see Fig. 6) and fastened in place on the floor which is recessed to allow the roller to be depressed below the level of the floor. Then the frame will be fastened in place. The closure is grooved along the bottom by any suitable machine, tool or other means. I find that $\frac{1}{4}$ inch radius is most suitable for inscribing the rim of said wheel, and the depth of the groove should be $\frac{3}{8}$ of an inch while the mouth of the groove is preferably $\frac{5}{16}$ of an inch wide. By these proportions the appropriate taper is given to the intermediate face of the groove and the walls of the groove will prevent the roller from over-riding or climbing out of the groove which is otherwise liable to occur whenever the closure is moving rapidly while lateral pressure is applied thereto. The intermediate face of the groove may, if desired, be lubricated by the application of plumbago, powdered or otherwise; but ordinarily the groove is finished smoothly and not lubricated.

In order to secure the highest perfection of movement in the sliding door, I have found that it is desirable that the connection of the top of the closure with the hanger should be as nearly solid as possible but should have a quality of resiliency and should not be made with continuous material but with a sufficient number of joints or breaks to lessen or prevent the transmission of vibration which might produce noise. Therefore I have constructed my noiselessly guided sliding door with a resilient brace for the suspension bolt, the same being constructed of two resilient bows or fingers 27, 28, riveted to a bed plate 29 and having their upper ends engaging the suspension bolt 11, and notched to conform to the cylindrical form of said bolt.

30 designates screws each passing through its respective finger and the bed plate at points at which the fingers and bed plate are not in contact so that when the bed plate is in place and the fingers are adjusted with their curved notches 31 embracing the bolt 11, and the screws 30 are tightened, the fingers are caused to resiliently clamp the bolt. The vertical hole 32 in the closure through which the bolt extends should be considerably larger in diameter than the bolt; the contact of said bolt with the closure or its immediate connection being made only through the lower end of the bolt and the bed plate and brace fingers. The hole 33 through the bed plate should accurately fit the bolt. By thus mounting the closure with an upper connection for said over-head roller having a semi-resilient and semi-rigid quality or character and a center roller guide having a resilient action against the bottom of the closure, I provide against any tendency of setting up vibration or superfluous movement, either at top or bottom.

It is to be understood that the closure 1 of this improved door is supported by two rollers 10, Fig. 7, which are duplicates of each other and are fastened to the closure 1 to support it in the usual manner and roll upon the rail 8.

In the drawings, for convenience, only the top and bottom front corners of the closure are shown, except in Fig. 7; it being unnecessary for a full understanding of the invention to show the entire closure and its usual over-head rollers, except in said latter view.

D designates the mouth post of the wall pocket in which the closure 1 moves. The anchor plate *b* is constructed as a part of a semi-metallic wall structure which

is fully described in my co-pending application, Serial Number 246,325, filed on the 18 day of February 1905. The anchor plate *b* is a U shaped plate fastened by rivets 34 to brackets 35 and stays 36 which are fastened to the parts thus tying the posts together and holding them accurately together in position. The opening *a* of the U being definitely located between the two posts D serves to receive and accurately center the frame 13 of the roller guide when the parts are assembled. Preferably the front screws 37 by which the frame 13 is fastened to the floor are so located as to be concealed by the jambs 38 and stops 39 when the same are in place.

Although the bearings of the roller and the carrier are practically anti-friction, they are so located that they may be reached with an oil can for oiling same. On account of the roller 4 being pressed upward against the bottom of the door, the weight of the door is partially taken off from the rollers at the top thereof and a door provided in which the resistance to opening and closing is mostly near the bottom, this point being most conveniently accessible in car doors when opened by a person standing on the ground.

The hole 32 is desirably of larger diameter than the bolt 33 so that in mounting the closure, it is immaterial

whether or no the bolt 32 be bored in a vertical line, as considerable departure from such line may occur without interfering with the bolt which is held true by contact with the plate 29.

Claims.

1. A movable body having a groove, the inner portion of the face of which is curved in cross-section, means for supporting said body and a roller having a portion of its rim in said groove, said portion being curved correspondingly to said face.

2. An edgewise moving closure grooved in its lower edge, an over-head rail and rollers for supporting the closure, and a roller stationed below the closure and yieldingly pressed into the groove.

3. A sliding closure, a bolt suspending the closure, resilient braces engaging said bolt, and means for holding the braces in tension between the bolt and closure.

4. In a door hanger, the combination with the closure and its suspension bolt of a bed plate through which the bolt passes, two resilient braces fastened on the plate, and engaging the bolt, and screws through the braces and plate, into the closure for producing a tension in the braces.

Signed at Bridgeport, Connecticut January 28, 1905.

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Witnesses:

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