

920,083.

E. C. PITCHER.
SLIDING DOOR STRUCTURE.
APPLICATION FILED JAN. 31, 1908.

Patented Apr. 27, 1909.
2 SHEETS—SHEET 1.

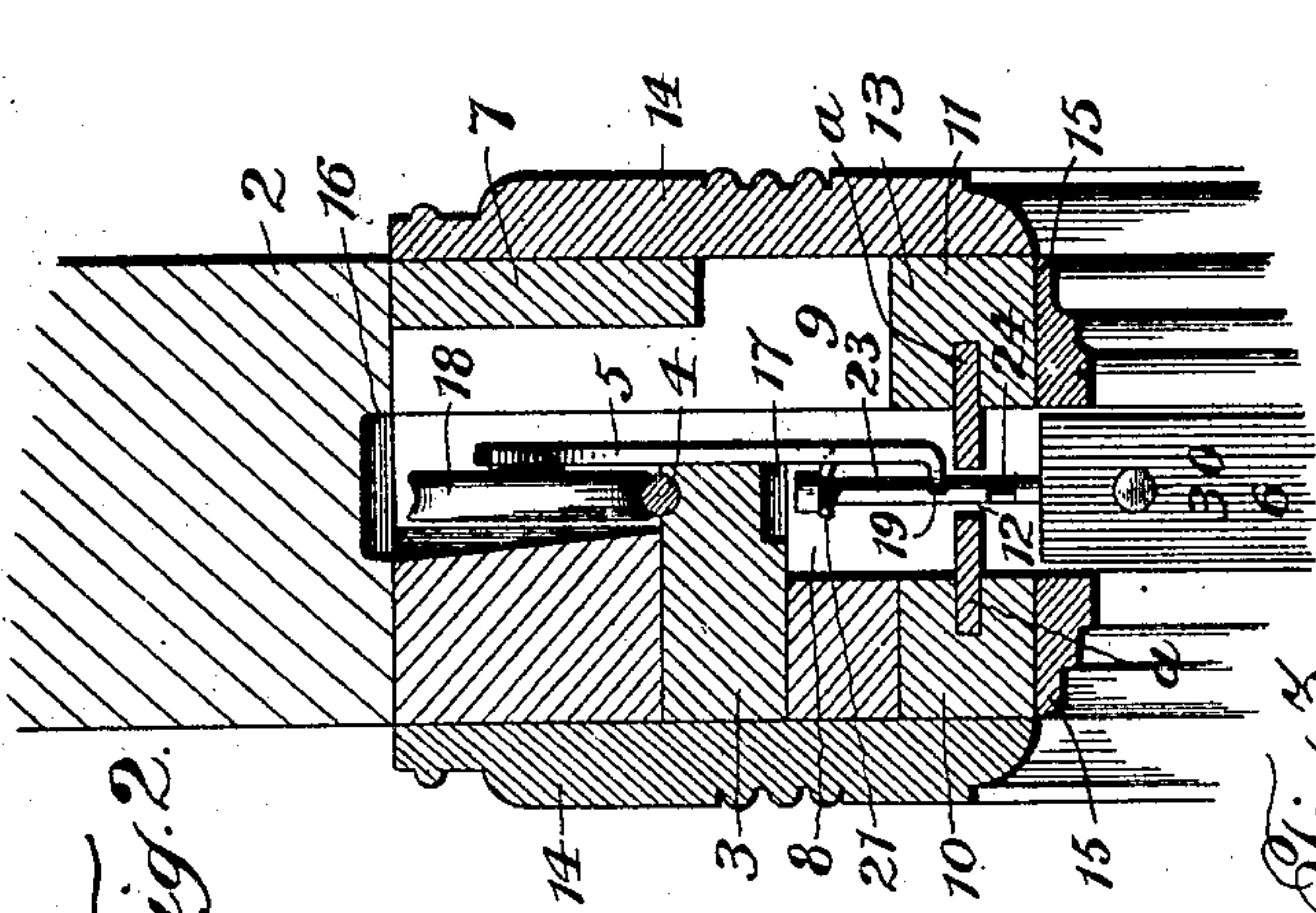


Fig. 2.

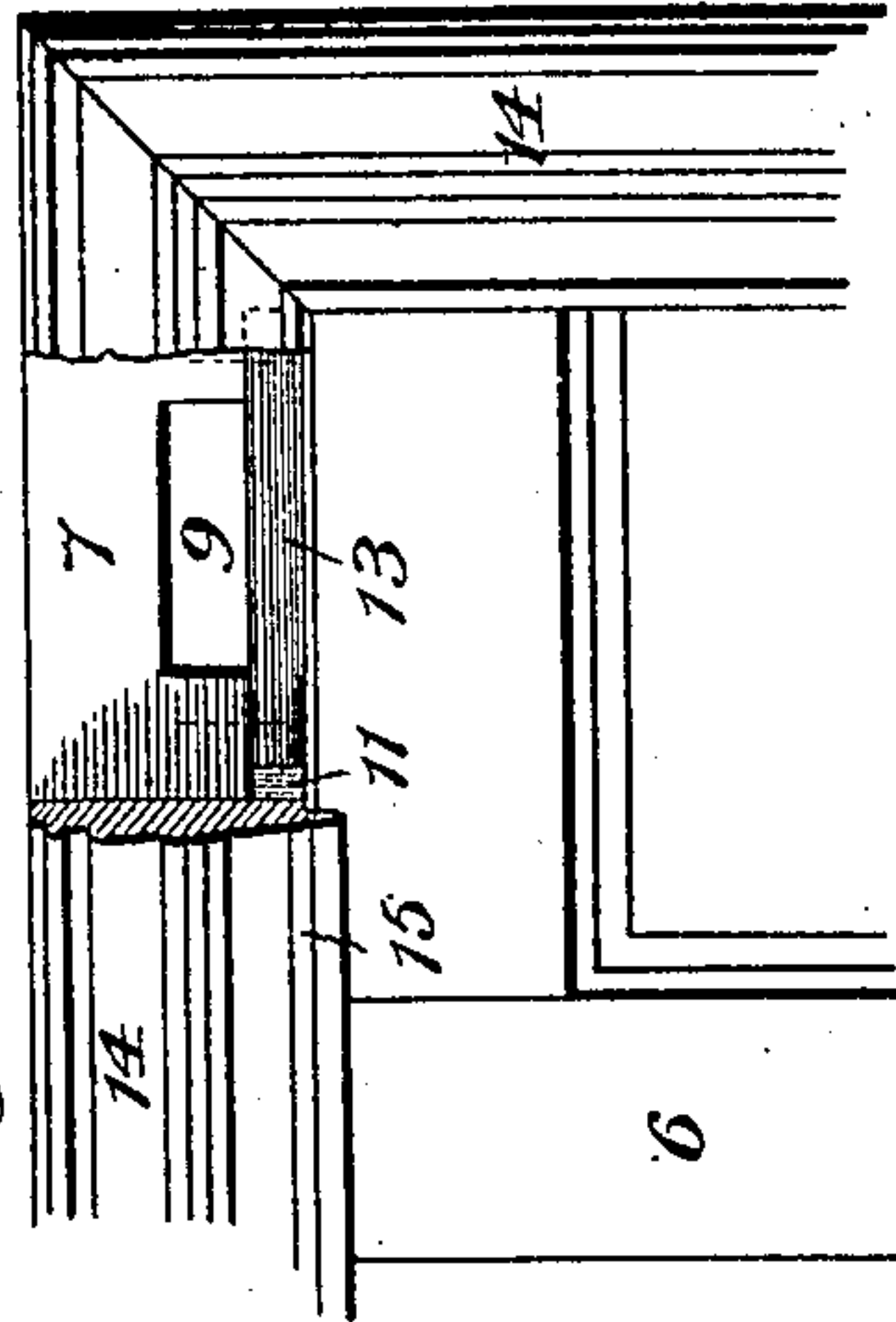


Fig. 3.

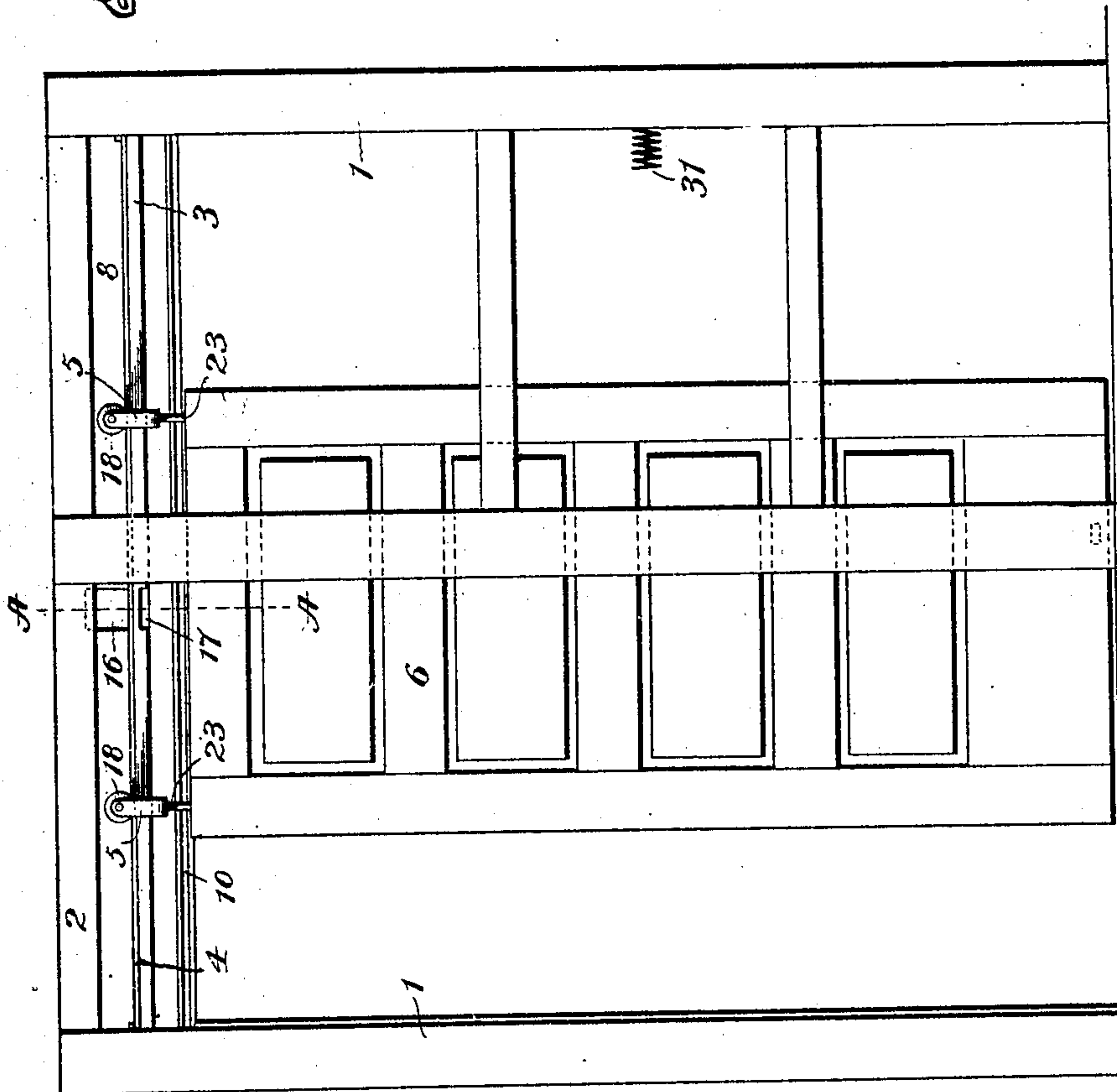


Fig. 1.

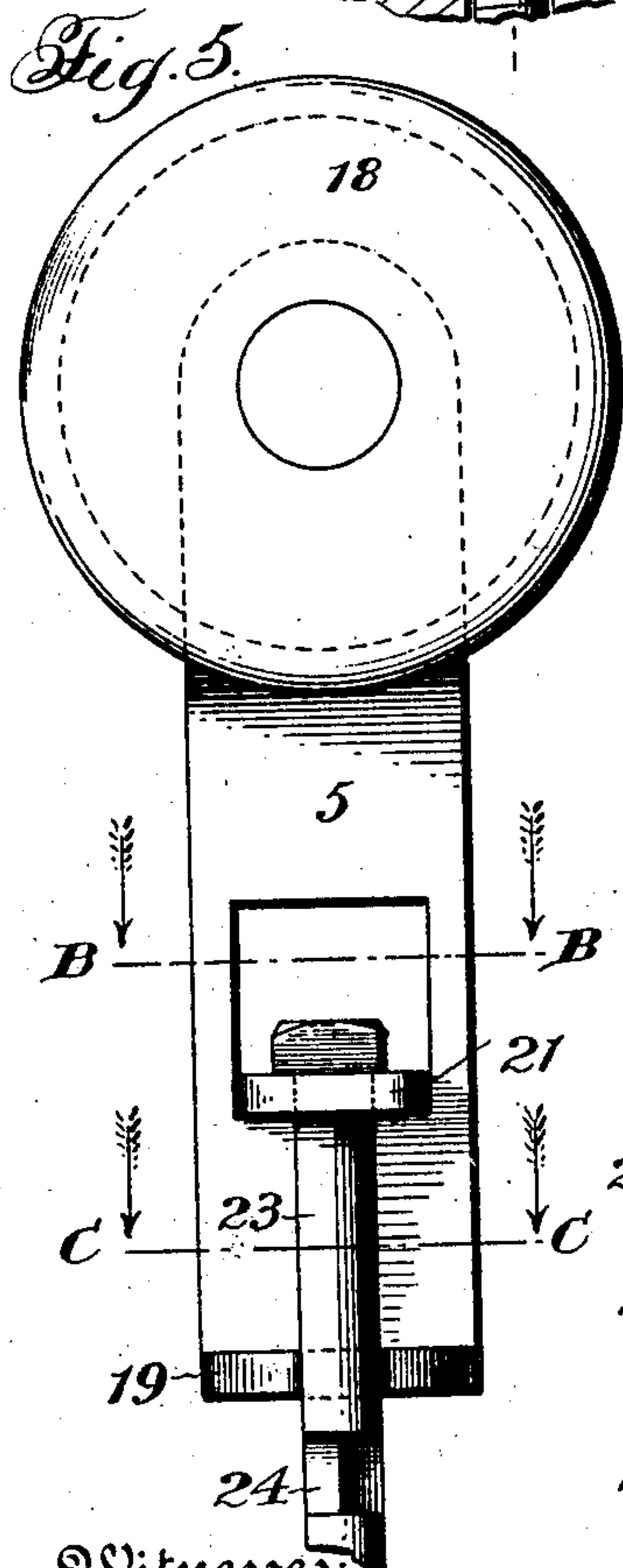
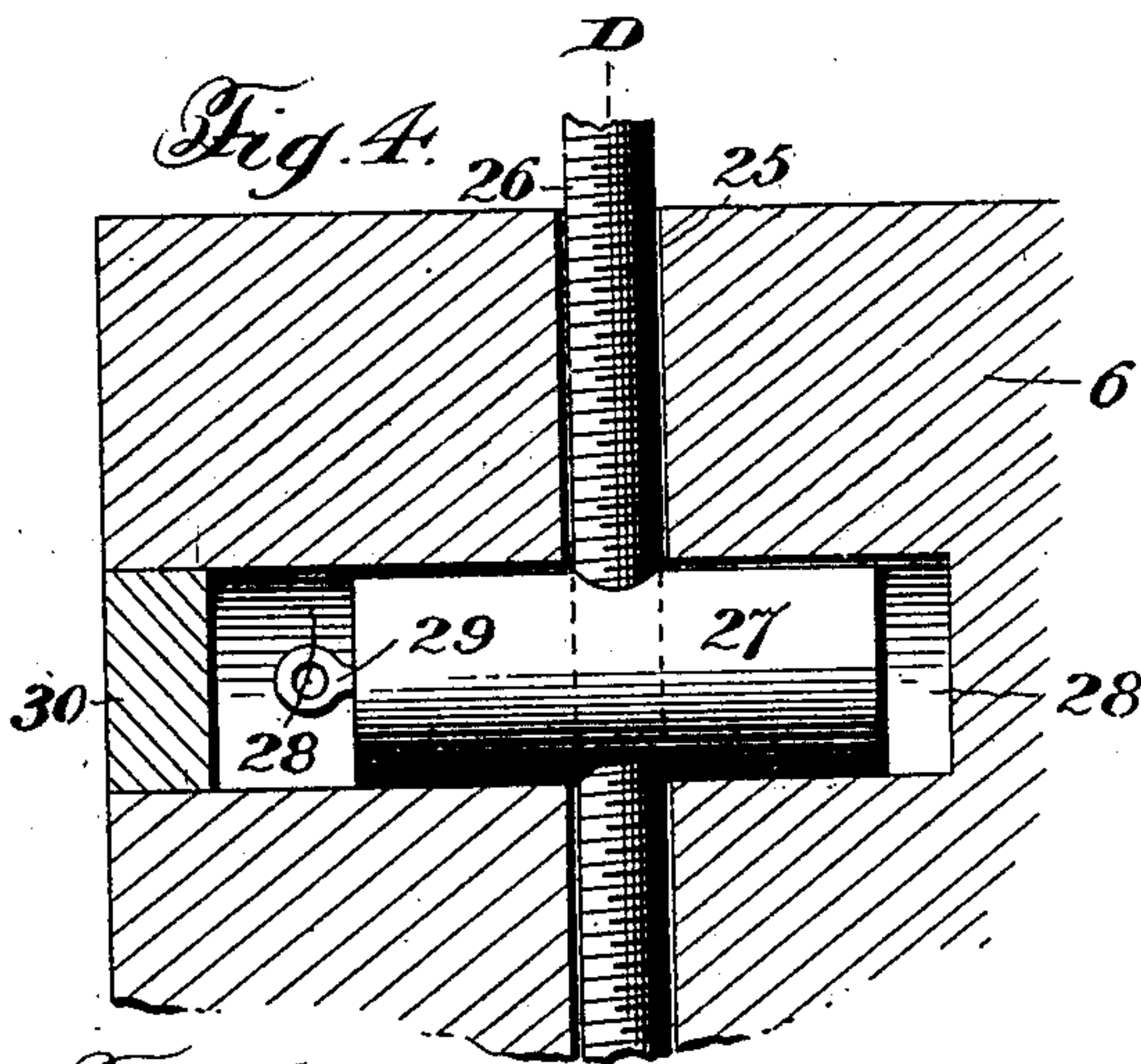
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2 SHEETS—SHEET 2.



Witnesses:

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G. A. Marvin.

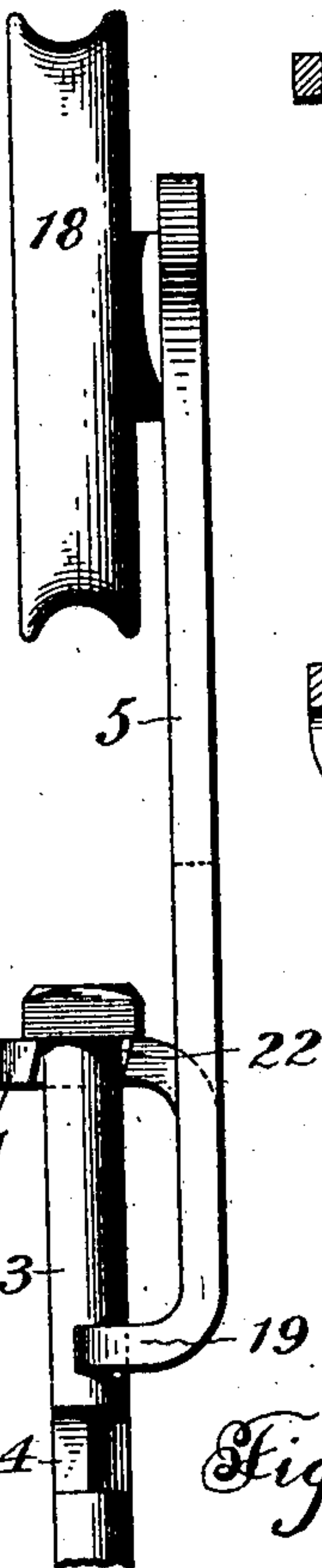


Fig. 6.

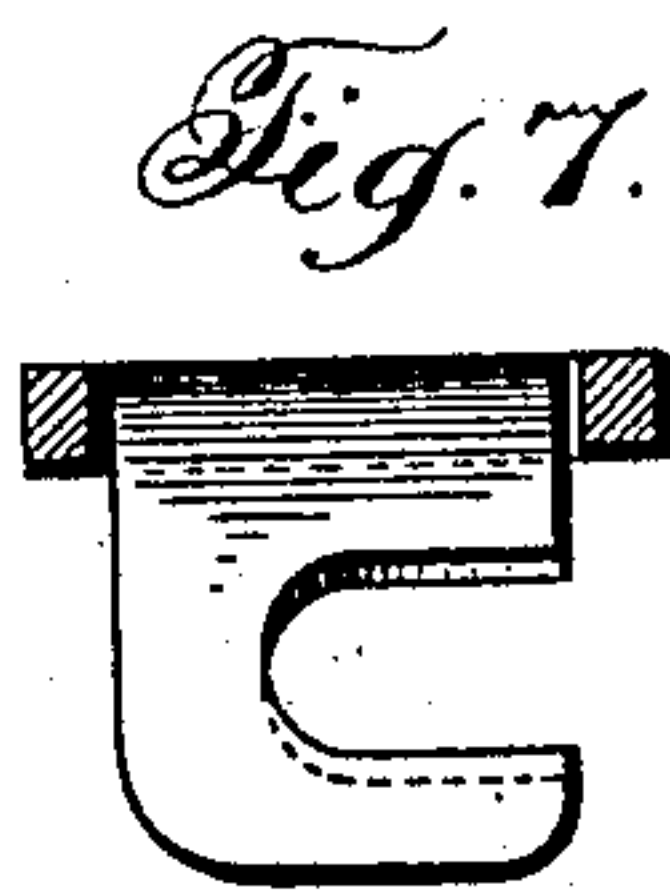


Fig. 7.

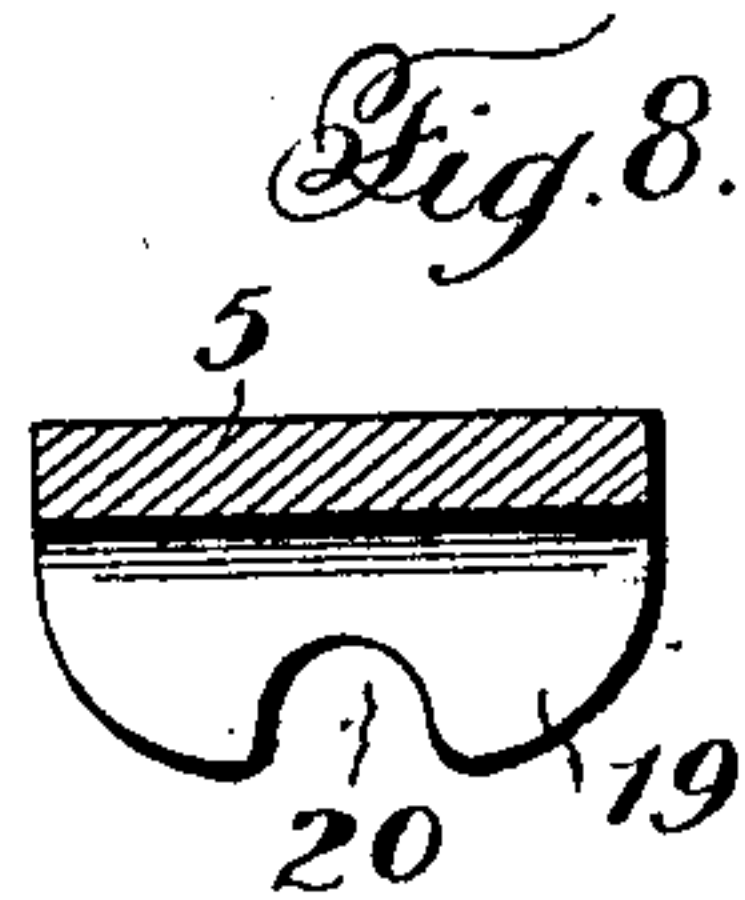
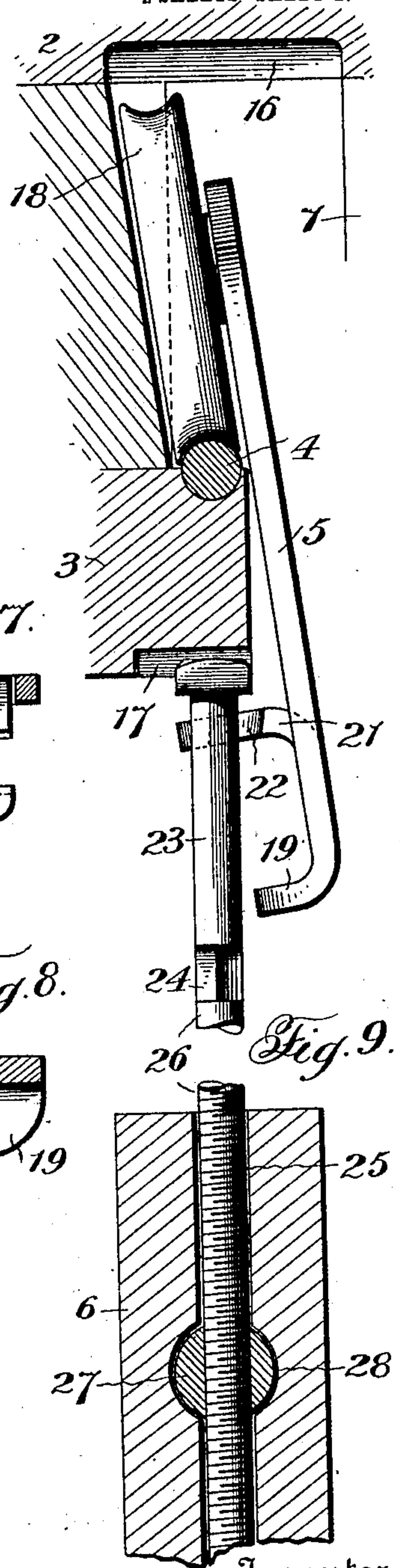


Fig. 8.



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UNITED STATES PATENT OFFICE.

ELMER C. PITCHER, OF SAN FRANCISCO, CALIFORNIA.

SLIDING-DOOR STRUCTURE.

No. 920,083.

Specification of Letters Patent.

Patented April 27, 1909.

Original application filed December 27, 1905, Serial No. 293,482. Divided and this application filed January 31, 1908. Serial No. 413,640.

To all whom it may concern:

Be it known that I, ELMER C. PITCHER, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Sliding-Door Structures, of which the following is a specification.

This invention relates to sliding door structures, and this application is a division of my application filed December 27 1905 Serial Number 293,482 having particular reference to the structure illustrated in Figures 1, 2, 3 and 4. of the drawings, that is to say to the rail, support or track and its associated structure as distinguished from the hanger device proper illustrated in the remaining figures of the drawings.

One of the objects of the invention is to provide a simple, cheap and efficient overhead support for door-hangers, whereby all danger of sagging or displacement of the parts is avoided.

Another object is to provide such a construction as will be adapted to light, as well as heavy doors, and will be more economical of space than ordinary sliding doors.

A further object is to provide such a construction whereby the hangers as well as the door, may be readily removed for inspection or repair without injuring the woodwork.

Still another object is to provide a hanger which may be stamped from sheet metal or the like, thereby increasing the strength and accuracy of the hangers, and decreasing the cost of production.

Another object is to provide means whereby the height of the door above the floor may be varied at will.

Another object of the invention is to provide a structure, having the above characteristics, that can be made complete in the factory ready for insertion in the building. And objects particularly in view in the devices especially referred to in this division are to provide a strong, cheap and efficient track for a sliding door; and to provide also a track which though having a metallic tread will be practically noiseless.

These objects are accomplished by means of the devices illustrated in the accompanying drawings, in which:—

Fig. 1 is an elevation, portion being omitted to more clearly illustrate the invention. Fig. 2 is an enlarged detail showing a cross-

section through A—A of Fig. 1. Fig. 3 is a detail, the casing being broken away to show the removable piece of the door lintel. Fig. 4 shows the means of attaching the hangers to the door. Fig. 5 is a front view of the hanger. Fig. 6 is a side view of the hanger. Fig. 7 is a cross-section through B—B of Fig. 5. Fig. 8 is a cross-section through C—C of Fig. 5. Fig. 9 is a side view of the hanger and section through D—D of Fig. 4. This view shows the position of the hanger preparatory to its removal, or the removal of the door.

Referring to the drawings 1 represents a suitable frame securely fastened together and provided with a longitudinal piece 2. Below piece 2 and preferably attached thereto is a track-supporting-member 3 provided with a track 4, shown in the drawings as a round metal bar set into member 3 about half of its diameter and held in place by any suitable means. Supported from the track 4 by hangers 5 is a door 6 adapted to slide within the frame 1. In front of the track 4 and its supporting-member 3, is a strip 7 preferably attached to piece 2 and adapted to form one side of a suitable runway or channel 8. Strip 7 is provided with a cut-away part or aperture 9 as shown in Figs. 2 and 3. Attached to member 3 and strip 7 are stringers 10 and 11 respectively in which are mounted strips *a* to form the bottom for the channel 8 and provide a longitudinal slot 12. Below aperture 9, stringer 11 is provided with a removable portion 13 adapted to close the bottom of the aperture. 14 shows an ordinary outer casing and 15 represents the top door stops. The piece 2 is provided with notches or openings 16 and member 3 is provided with a notch 17 as shown in Figs. 1, 2 and 9.

The hanger 5 which is preferably made of sheet metal is provided with a wheel or runner 18 suitably journaled thereon. Near the lower end of the hanger 5 is a lug or projection 19 having a slot or recess 20 transverse to the plane of the door. Above the lug 19 is a second lug 21 projecting from the same side of the hanger and provided with a slot or recess 22 preferably at ninety degrees to slot 20 and in a parallel plane. The sides of the slot 22 are preferably at an angle from the perpendicular when in position, as shown in Figs. 6 and 7. The centers of slots 20 and 22 are preferably in the same vertical

line and lie directly beneath the center of runner 18. As will be seen from the various views, the hanger 5 is formed of one piece of sheet metal from which the lugs 19 and 21 and recesses 20 and 22 are stamped out. Projecting through slots 20 and 22, its head resting upon lug 21 is a bolt 23 which may be provided with a square portion 24 below the lug 19 to receive a turning key or wrench. The lower end of this bolt 23 passes through a hole 25 in the door 6 and is provided with threads 26 adapted to engage with a nut 27 secured in the door. The nut 27 is preferably of elongated or cylindrical form and is placed in a hole 28 bored from the edge of the door at right angles to hole 25. This nut is provided with suitable means for placing it in the hole and removing it therefrom, shown as an eye or loop 29. A plug 30 or other cover is preferably provided for the hole 28. A spring or buffer 31 may be provided to act as a cushion for the door 6.

In practice the frame 1 is set in position and finished with its casing in place with the exception of that portion of the top stop 15 under the removable piece 13. The hangers 5 are placed on the track 4 by means of the opening left by the piece 13 and aperture 9. The bolts 23 having been previously secured in the door 6 are interlocked with the hangers 5. The door may be raised or lowered after it is hung in position, by simply turning bolts 23 by means of a wrench on the square portion 24. After the pieces 13 and the top stop 15 have been secured in place, the door is ready for use.

The piece 2 acts as a stop which prevents the runner 18 leaving the track 4 and the member 3 prevents the bolts 23 with the door 6, from being raised, except to the aperture 17.

When it is required to remove the door or its hangers the piece 13 with the stop 15 is removed and one of the hangers is brought opposite to the aperture 9 and pockets 16 and 17. One side of the door is lifted slightly thus removing its weight from one of the hangers 5, the pocket 17 receives the head of the bolt 23. The hanger 5 is now free of the weight of the door and can be swung backward into pocket 16, the rail 4 acting as a pivot which owing to its circular section it is peculiarly adapted to do. The rail 4 also while presenting a wear resisting metallic tread surface, is practically noiseless, owing to its being deeply embedded in the sound deadening wooden supporting member 3. Swinging the lower end of the hanger forward disengages the bolt 23 from recess 20 of the lug 19. The slanting character of recess 22 of lug 21 permits this movement without undue play in the recess when in normal position. Moving the lower part sidewise disengages the hanger from the bolt 23 thus permitting it to be removed

through the aperture 9. The bolt 23 is screwed down into the hole 25 bringing its head below the stringers 10 and 11. The door is now moved forward so that the other hanger comes opposite aperture 9 and pockets 16—17 and is then removed in the same manner as the first hanger.

It will be seen that by the construction heretofore described, the door as well as the hangers are readily removed either for inspection or repairs without injuring the woodwork. The doors need not be put in place until after the building in which they are to be used is completed. This will be found very desirable, especially where highly polished doors or expensive wood is used, which might easily be scratched or otherwise marred during the completion of the building. The door hanging as it does directly beneath the runner by a single arm or connection fastened centrally to the door occupies the least possible wall space, a most desirable feature. The rail 4 having a continuous support its entire length is prevented from sagging or becoming distorted, thereby insuring perfect running of the door. The frame being built as a unit and independent of the framework of the building, is not necessarily affected by any settling of the building.

It will be observed that by connecting the hangers to the door by means of the bolts 23 and elongated nut 27 I avoid all possibility of the hangers working loose, which not unusually happens when the hangers are attached directly to the door by means of screws or the like. By these means I also produce a door in which the hangers are wholly concealed from view and which is not visibly disfigured by hanger attachments. It will be noted that the hanger attachments being centrally disposed can be used on doors of different thickness and avoid the necessity of making the hangers of different sizes.

It will be seen from the drawings, the hanger 5 loosely interlocks with the bolt 23. By using the term "loosely interlocking" I do not desire to be understood to mean any looseness in the parts when in place but only a loose interlocking for attachment and detachment, as distinguished from semi-permanent attachments such as screws, bolts, clamps and the like.

If for any reason the holes 28 are not exactly the same distance from the top of the door, the nuts 27 may be adjusted on the bolts 23 so that the door hangs perfectly parallel with the floor. It will be seen that the nuts 27 and bolts 23 permit vertical adjustment of the door to provide for the presence or absence of carpet.

A very important and desirable feature of this invention is the simplicity and cheapness of the hangers which are preferably stamped out of sheet-metal thereby insuring

great strength and avoiding hand work or fitting.

Owing to the shape of the recesses or slots 20 and 22, the bolts 23 are securely clamped or locked therein while in a vertical position and easily disengaged therefrom.

What I claim is:—

1. In a sliding-door-structure, the combination of a frame forming a channel provided with a slot and a lateral notch or recess into which a hanger may be tilted, a rail in the channel above the slot, tiltable hangers projecting through the slot adapted to travel on the rail, a door loosely interlocked with the hangers, a detachable section on one side of the slot to permit the removal of the hangers.

2. In a sliding-door-structure, the combination of a frame forming a channel provided with a slot and a lateral notch or recess into which a hanger may be tilted, a rail in the channel above the slot, tiltable hangers projecting through the slot adapted to travel on the rail, a door connected to the hangers by loosely-interlocking means whereby the door may be disconnected by tilting the hangers, a detachable section on one side of the slot to permit the removal of the hangers.

3. In a sliding-door-structure, the combination with a frame forming a channel provided with a notch or recess into which a hanger may be tilted, a rail having a continuous support, tiltable hangers adapted to travel on the rail, a door arranged beneath the channel loosely interlocked with the hangers and a removable piece in the frame to permit the removal of the hangers from the channel.

4. In a sliding-door-structure, the combination of a frame forming a channel provided with a rail, a door arranged beneath the channel, a hanger loosely interlocked with the door from which it is disengageable by tilting on the rail, the frame being provided with removable piece to permit the removal of the hangers and a notch in the side of the channel to permit the tilting of the hanger.

5. In a sliding-door-structure, the combination of a frame forming a channel provided with a rail, hangers to travel on the rail, a door loosely attached to the hangers so as to be detached by tilting the hangers, the frame being provided with a suitable notch to permit the tilting of the hangers on the rail which acts as a pivot therefor.

6. In a sliding-door-structure, the combination of a frame forming a channel provided with a rail and having a recess into which a hanger may be tilted, tiltable hangers to travel on the rail, a stop or abutment below the rail to prevent upward movement of the hangers, a door arranged beneath the rail loosely attached to the hangers so as to be

detached by tilting of the hanger, and suitable openings in the frame and in the abutment to permit the withdrawal of the hangers from the channel.

7. In a sliding-door-structure, the combination of a frame forming a channel provided with a rail and having a recess into which a hanger may be tilted, a hanger consisting of two parts one of which is tiltable upon the rail, a door arranged beneath the rail adjustably connected with the other part of the hanger and means for loosely-interlocking the two parts of the hanger by tilting one of them, the frame being provided with a removable piece whereby the upper part of the hanger may be removed from the channel.

8. In a sliding-door-structure, the combination of a casing having a channel provided with a rail and having a notch into which a hanger may be tilted, a tiltable hanger to travel on the rail provided with a lug on its lower end, a door arranged beneath the rail provided with devices adapted to loosely interlock with the lug and disengageable therefrom by the tilting of the hanger into the notch.

9. In a sliding-door-structure, the combination of a casing having a channel provided with a rail and having a recess into which a hanger may be tilted, a tiltable hanger to travel on the rail provided with a lug on its lower end, a door arranged beneath the rail provided with devices adapted to loosely interlock with the hanger and disengage therefrom by tilting of the hanger into the recess and a removable piece in the casing to permit the removal of the hanger from the channel.

10. In a sliding door structure, the combination of a frame including a rail comprising a member, one side of which is formed of two planes offset to each other, the offset being provided with a suitable track to support a hanger and said member having a recess in one of the offset planes into which a hanger supported by said track may be tilted, and a tiltable hanger to travel on said track.

11. In a sliding door structure, the combination of a frame including a rail comprising a wooden member one side of which is formed on two planes offset to each other, a circular section metallic track supported on the offset into which it is depressed a portion of its depth, and a hanger to travel on said track, said hanger having a curved surface to engage the said track so that the hanger can be tilted thereon, and said wooden member having a recess in one of the offset surfaces thereof into which the hanger is adapted to be tilted.

12. In a sliding door structure, the combination of a frame forming a channel provided with a rail, hangers to travel on the rail and a door detachably connected with the hangers, said frame being provided with openings

to permit the withdrawal of the hanger laterally therethrough.

13. In a sliding door structure, the combination of a frame forming a channel and including top and side longitudinal members and having a rail provided with a recess into which a hanger may be tilted, and said top member being provided with a recess in vertical alinement with the first mentioned recess, a hanger comprising a track member tilttable upon the rail and a door member,

and means on said members to interlock them together adapted to be uncoupled by tilting the track member and a door connected with the door member, one side member of the frame being provided with a lateral opening to permit the withdrawal of the track member.

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Witnesses:

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