

**No. 631,097.**

**Patented Aug. 15, 1899.**

**A. SOLOMON & J. VAN LEAVEN.**

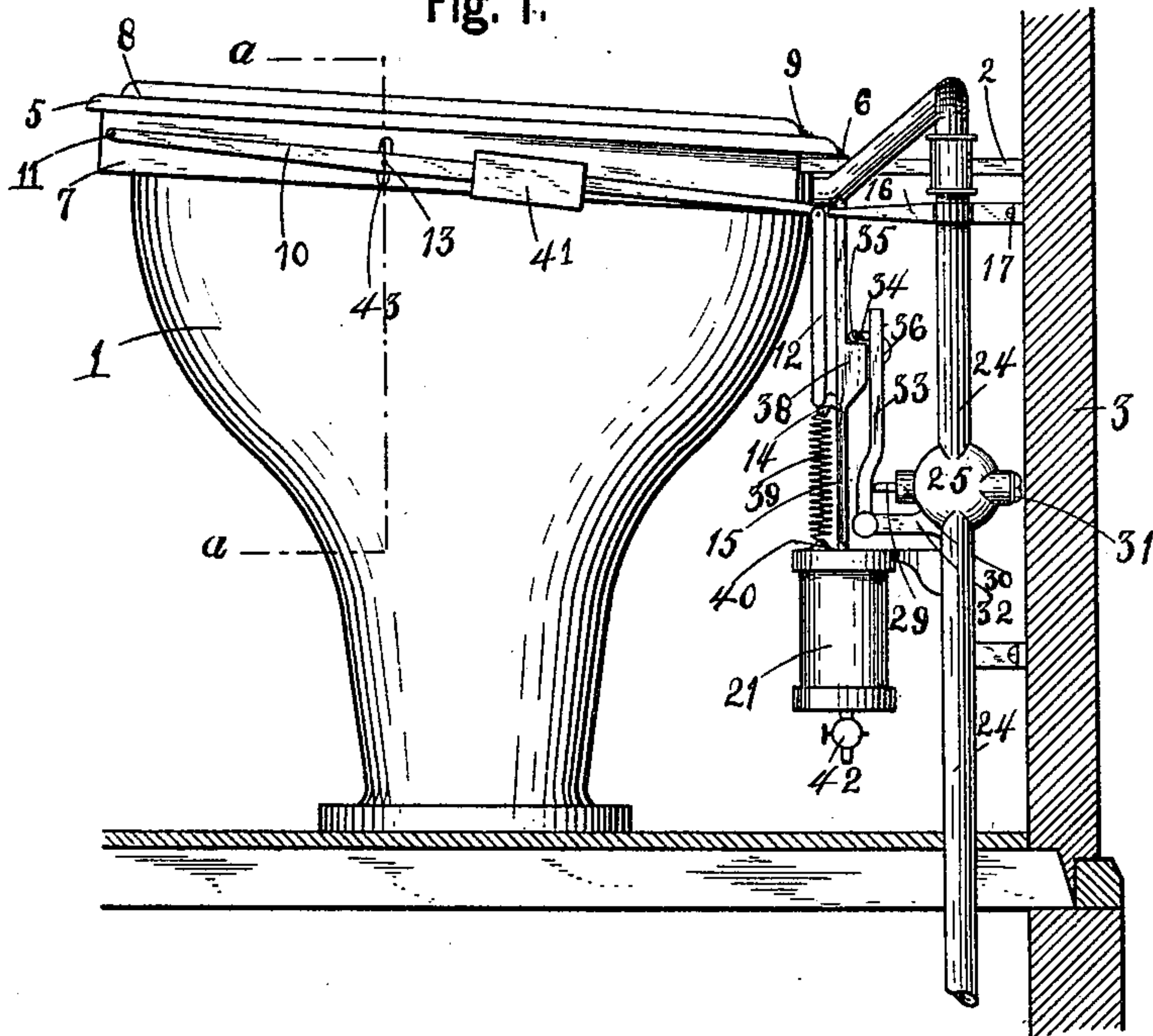
**WATER CLOSET.**

(Application filed Dec. 10, 1898.)

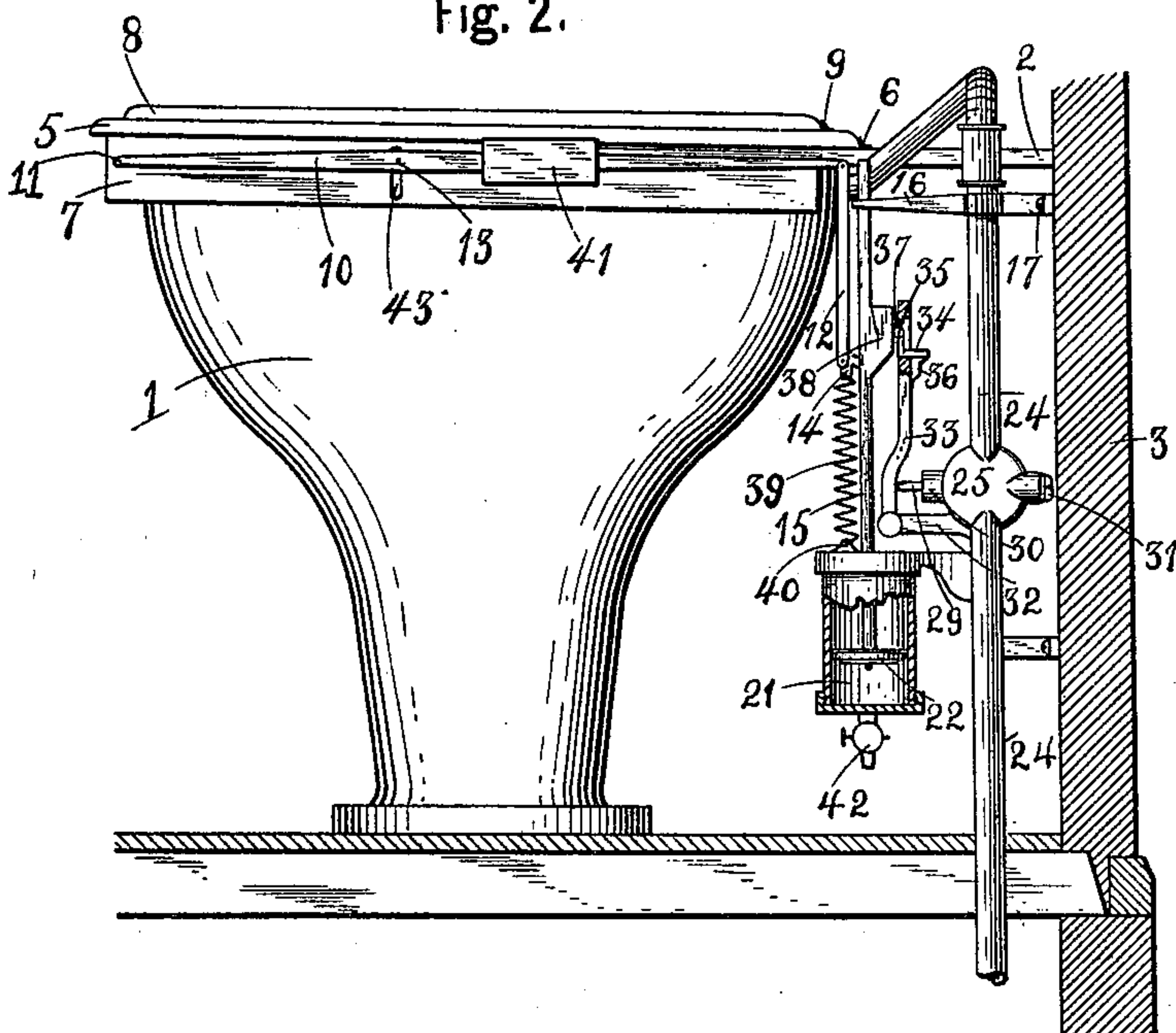
(No Model.)

**3 Sheets—Sheet 1.**

**Fig. 1.**



**Fig. 2.**



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Fig. 3.

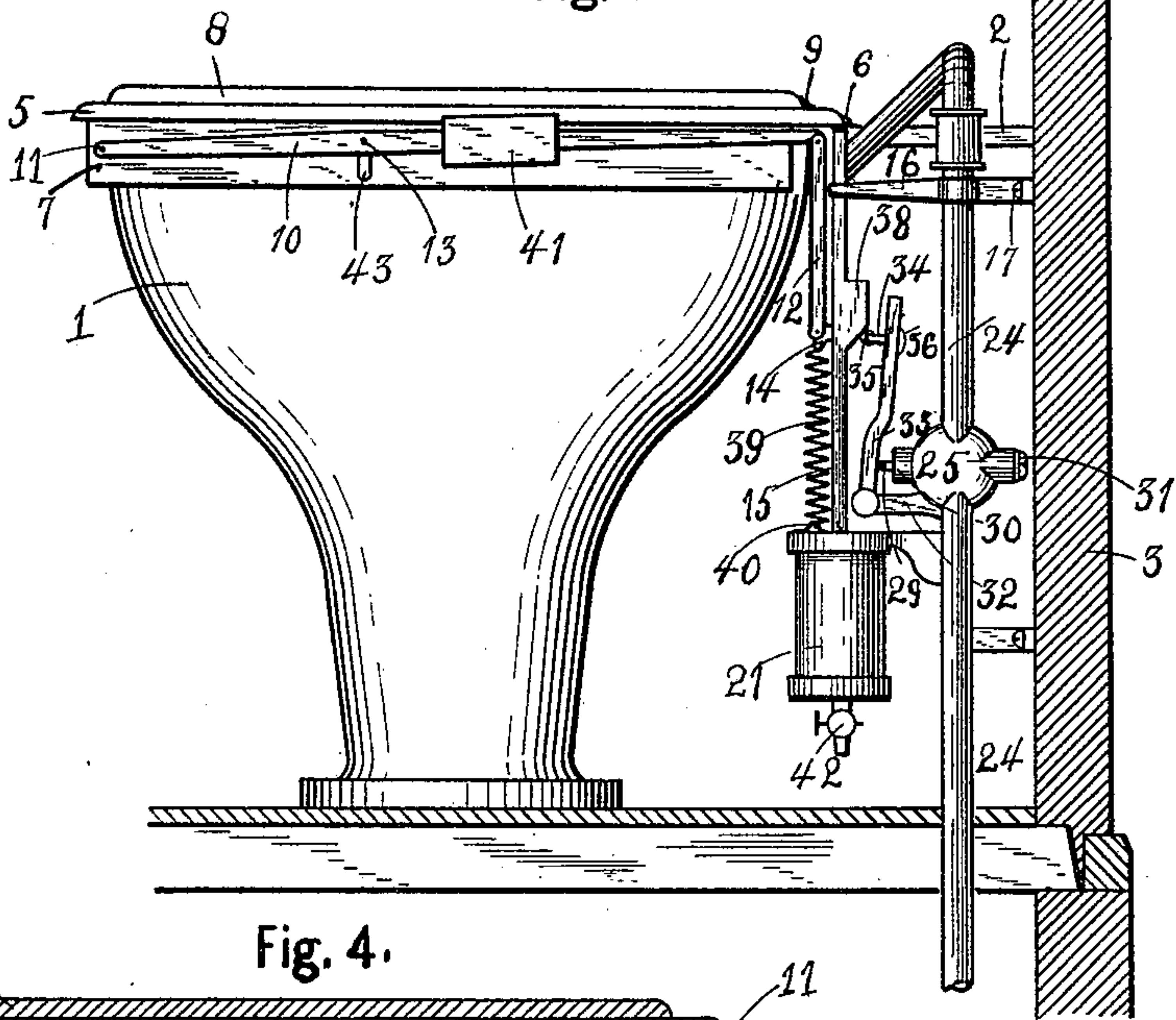


Fig. 4.

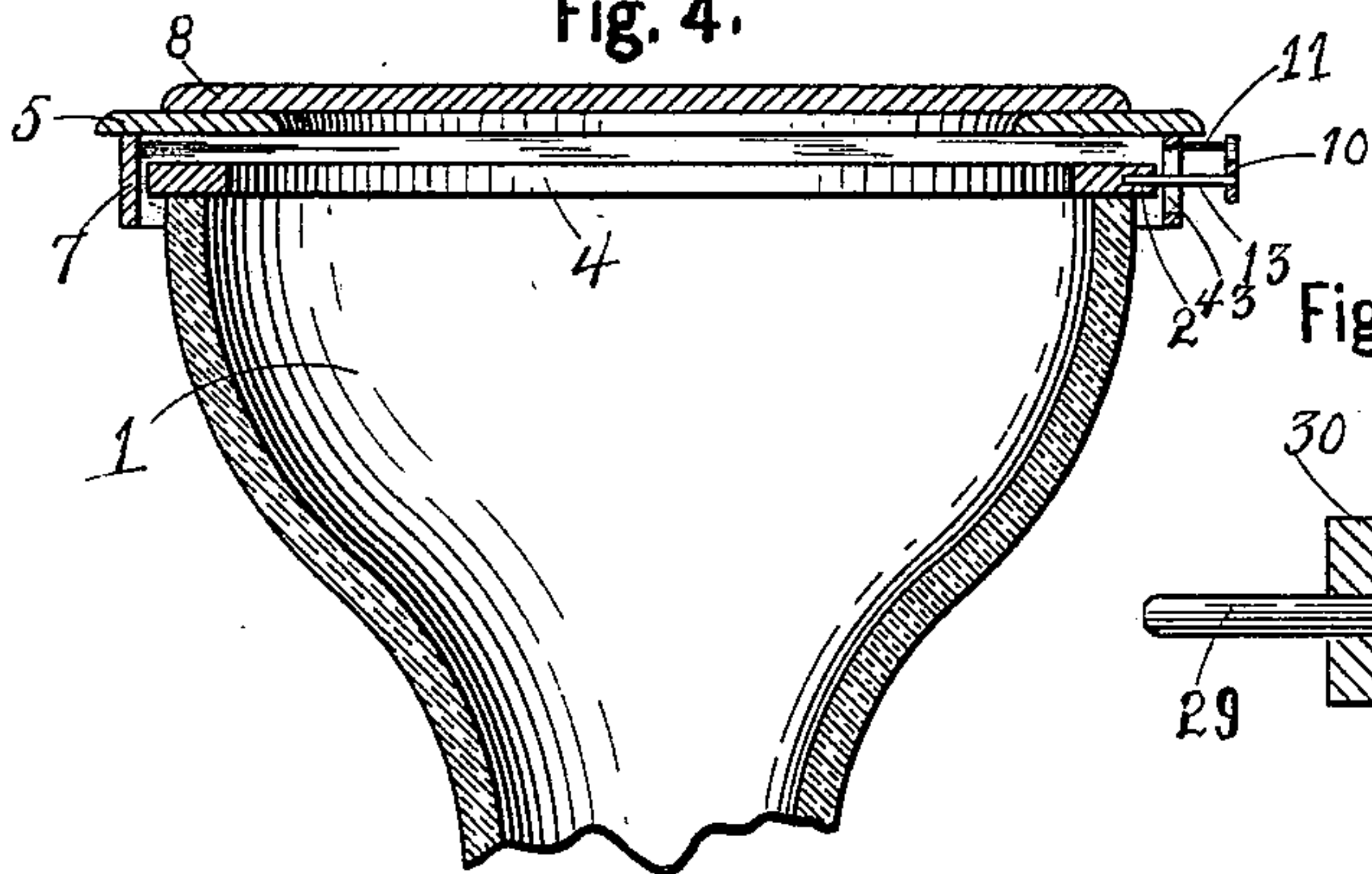


Fig. 5.

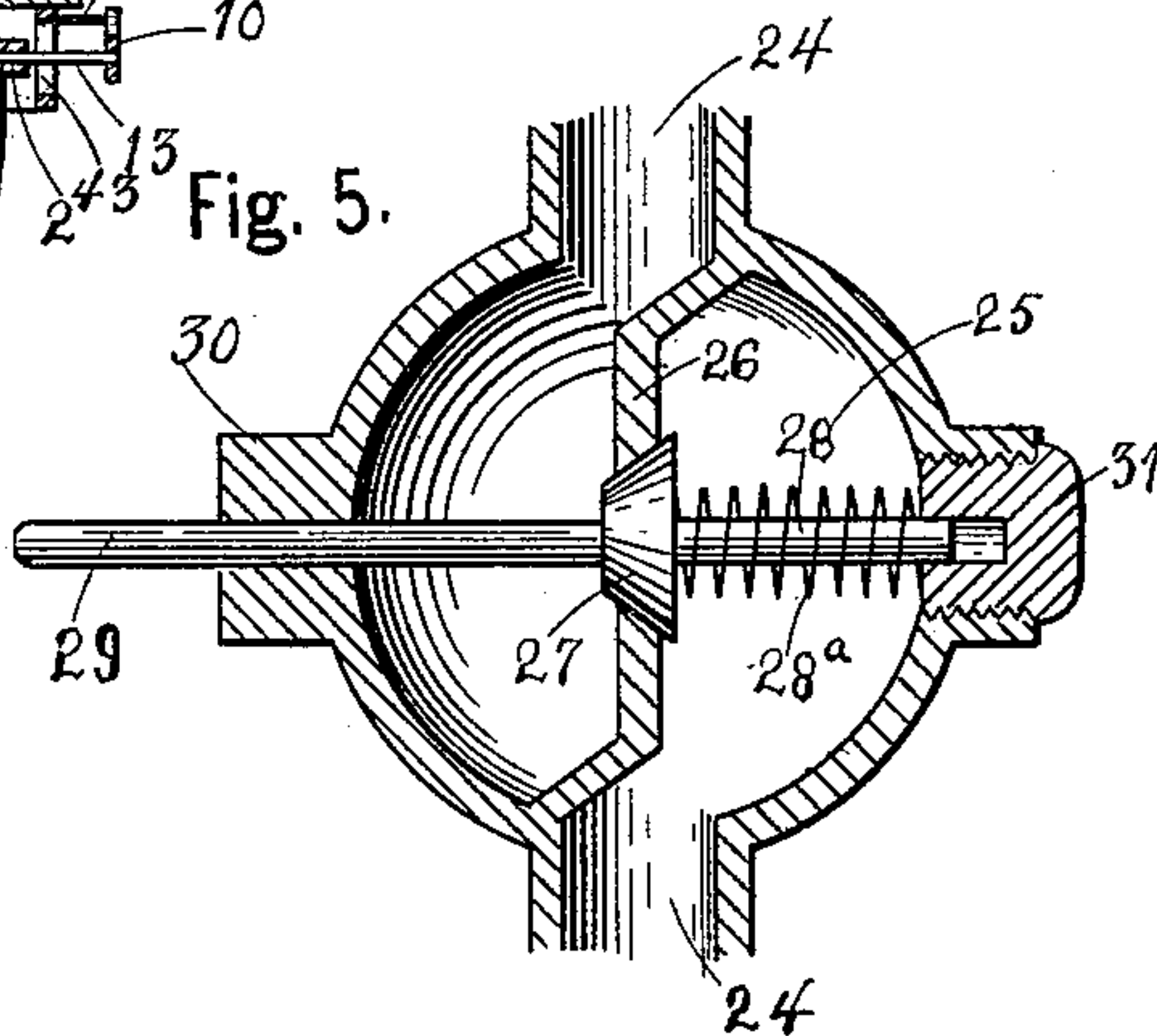
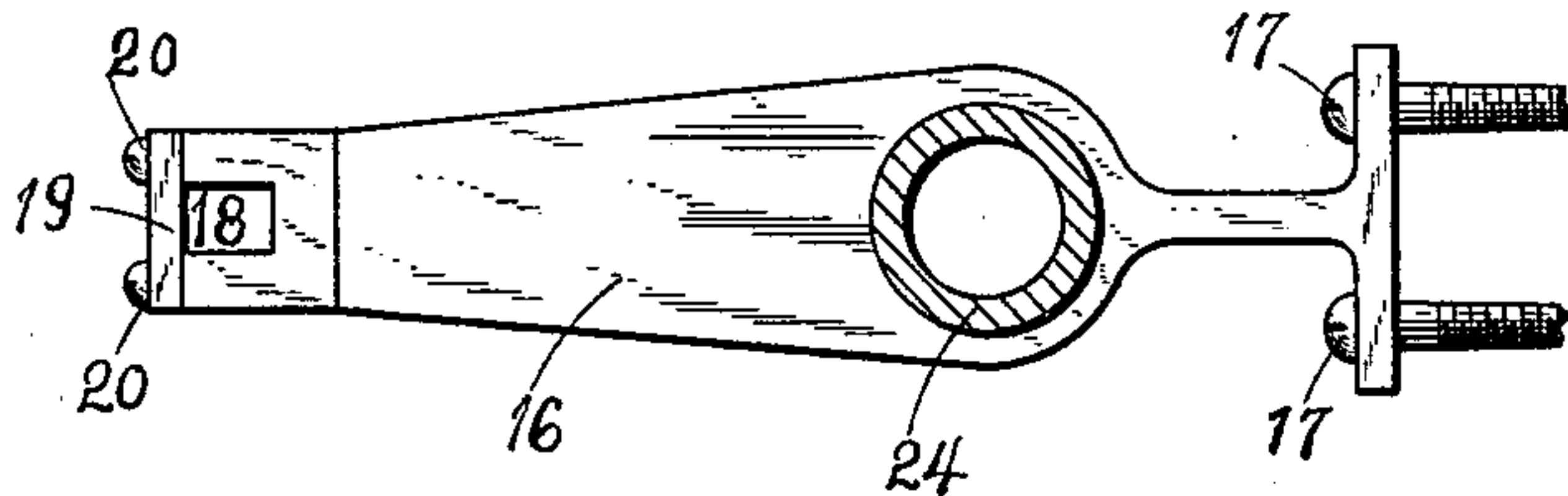


Fig. 6.



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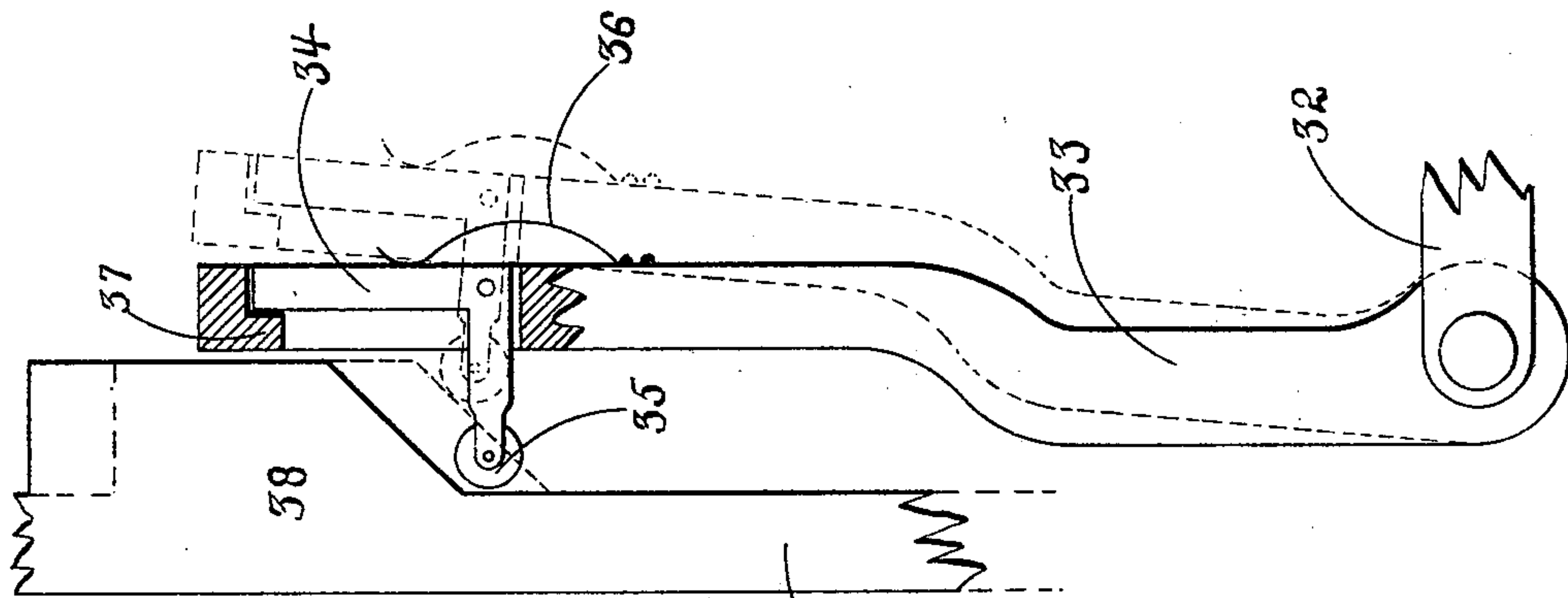


Fig. 8.

X ↓

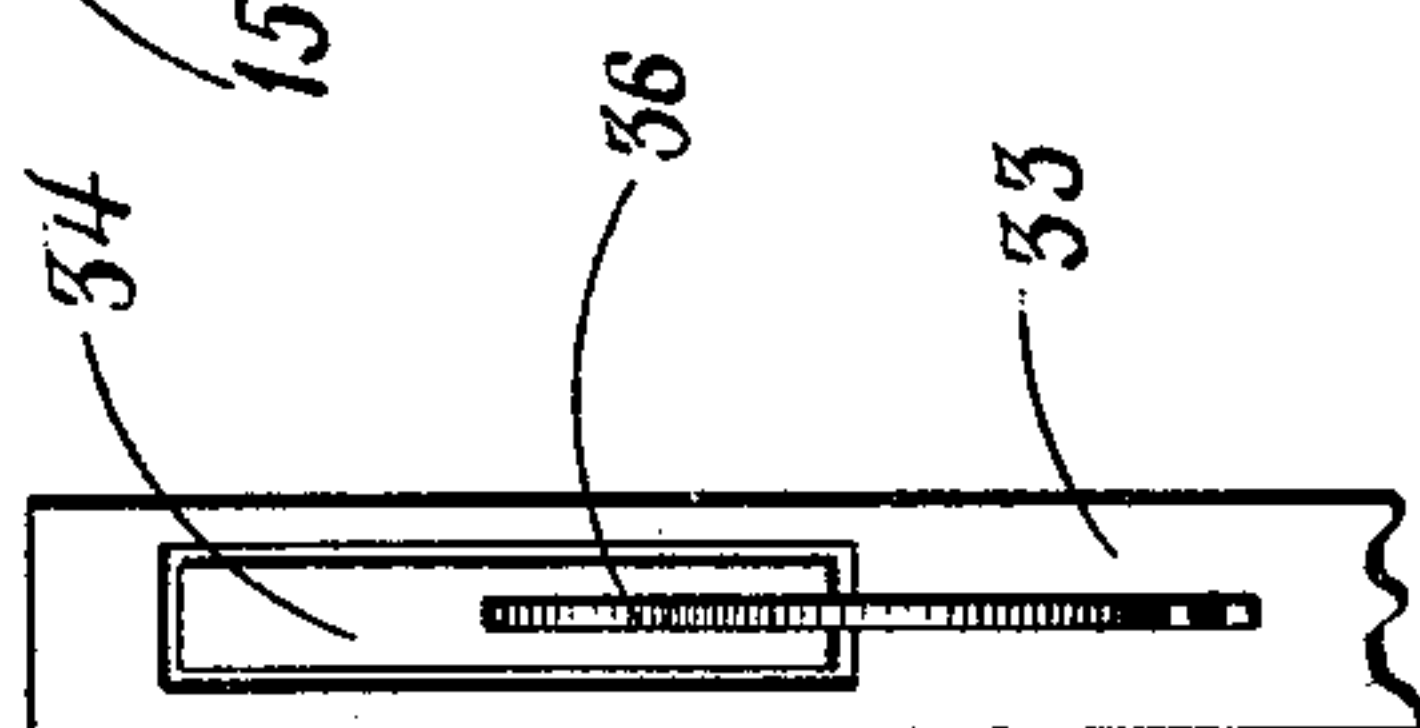


Fig. 9.

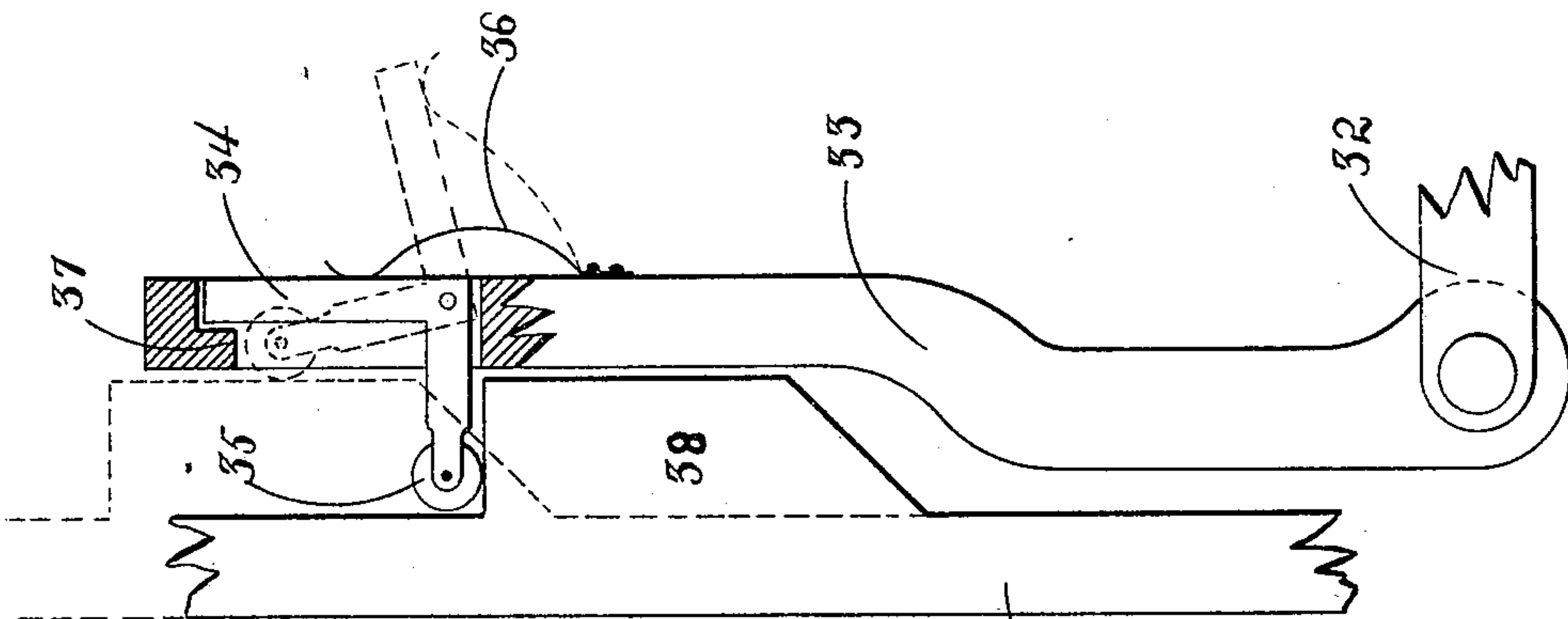


Fig. 7.

V ↑

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# UNITED STATES PATENT OFFICE

ARTHUR SOLOMON AND JOHN VAN LEAVEN, OF BUFFALO, NEW YORK.

## WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 631,097, dated August 15, 1899.

Application filed December 10, 1898. Serial No. 698,873. (No model.)

*To all whom it may concern:*

Be it known that we, ARTHUR SOLOMON and JOHN VAN LEAVEN, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification.

Our invention relates to an improved water-closet adapted to be flushed by direct pressure; and the object of the invention is to provide a simple and cheap mechanism for automatically flushing the closet after the person using it has left. To attain this object, we provide mechanism for normally sustaining the closet-seat at a slight elevation above the bowl and connect said mechanism to a valve in the water-pipe, the mechanism being so arranged that it will traverse its path of movement upon the depression of the seat without opening the valve and upon the removal of the weight from the seat and its return to its normal position will open the valve to flush the closet.

Another object is to provide an air-pressure device for regulating the speed of the return of the seat and the connecting mechanism when in the depressed condition to the normal position and thereby regulate the interval of time during which the valve will remain open and the duration of the flushing.

It also relates to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings and the following description, in which a preferred adaptation of our invention is shown and described.

Figure 1 represents a side elevation of our improved closet and its connected flushing mechanism in the normal position. Fig. 2 represents a side elevation with the seat partially depressed, the piston partially raised, and the angle portion pivoted in the upper extreme of the valve-operating lever turned or rotated to one side to permit the piston to pass without moving the lever, portions being in section to illustrate their construction. Fig. 3 is a side elevation with the seat partially raised and the valve-operating lever moved sufficiently to open the valve to flush the closet. Fig. 4 is a section on or about

line *a a*, Fig. 1. Fig. 5 is an enlarged section through the flushing-valve. Fig. 6 is an enlarged detached top plan view of the standard for supporting the upper end of the piston-rod. Fig. 7 represents an enlarged detached view of the piston-rod and the valve-operating lever and its angle portion, illustrating the piston-rod in its lower position in full lines and in a partially-elevated position with the angle portion turned to one side in dotted lines. Fig. 8 represents an enlarged detached view of the piston-rod and the valve-operating lever, illustrating the piston in its elevated position in full lines and in a partially-lowered position in dotted lines, also illustrating the valve-operating lever in its normal position in full lines and moved to one side to open the valve in dotted lines. Fig. 9 is an enlarged side elevation of the upper portion of the valve-operating lever.

In referring to the drawings for the details of construction like numerals represent similar parts.

1 designates the bowl, which may be of any well-known construction or pattern and is attached to the floor in the usual manner. A horizontal support 2, preferably formed of wood, rests upon the upper edge of the bowl and is attached at its rear extreme to the side wall 3 of the room in any well-known way and provided with an opening 4.

The seat 5 is secured at its rear end to the support 2 by hinges 6 and is provided with a rim or flange 7, which extends substantially vertically downward from at or near the edge thereof and is adapted to lap over the top edge of the bowl.

A top cover 8 is secured at its rear to the seat by the hinges 9. A lever 10 is pivotally attached at its forward end to the seat by means of the pin 11 and at its rear end to the upper extreme of the connecting-rod 12 and is pivotally fulcrumed or supported by the pin 13, extending from the support 2.

The lower end of the connecting-rod 12 is fastened to a lug 14, projecting from the side of a piston-rod 15. The upper end of the rod 15 is supported in the horizontal standard 16, so as to be vertically movable therein, which projects from and is fastened to the side by any well-known means, preferably the screws 17. The construction of this stand-



ard is shown in Fig. 6, in which its outer end is provided with a vertical slot 18, forming a slideway for the upper end of the piston-rod, the rod being held in place by the plate 19, which is fastened in place with the screws 20.

The lower end of the piston-rod extends into an air chamber or cylinder 21 and is provided with a piston 22, which is secured thereto by a screw or similar means.

The water-pipe 24 extends into the upper part of the bowl and is provided with an intermediate valve mechanism, substantially as shown in Fig. 5, in which an enlarged chamber 25 is provided with a valve-seat 26 and a valve portion 27, having a rearwardly-extending rod 28, provided with a spring 28<sup>a</sup> for normally holding the valve portion 27 against its seat and the valve closed and a forwardly-extending rod 29, the outer end of which extends through the side of the enlarged chamber 25 and a stuffing-box 30 upon the extreme of said chamber. An opening is provided on the rear side of the chamber 25, which is closed by the screw-cap 31, for the purpose of affording entrance into the interior of the chamber for examining or fixing the valve.

It will be noticed by reference to Fig. 5 that the valve is so arranged that the pressure of the water assists in maintaining it in its normally-closed condition.

A lug 32 projects out from the water-pipe at the lower portion of the enlarged chamber, and a valve-operating lever 33 is pivotally attached at its lower end to said lug. The upper end of said lever is provided with an opening in which is pivotally mounted an angle portion 34, having a friction-roller 35, mounted at the outer extreme of one of the angle parts. A spring 36, extending from the lever 33, has its free end tensioned against the angle portion and normally maintains the friction-roller-supporting part of said angle portion in a substantially horizontal position, a lip 37 projecting downward by the upper edge of the opening in the upper end of the lever 33, against which the upper extreme of the other angle part abuts to limit its outward movement.

The piston-rod is provided with an enlargement 38, having its upper edge substantially horizontal and its lower edge beveled or extending diagonally downward.

A spring 39 is fastened at its upper end to the lug 14 and at its lower end to an extension or lug 40, projecting from the air-cylinder, and serves to return the piston-rod to its normal position. A counterweight 41 is adjustably supported upon the lever 10, which, in connection with the spring 39, acts to lift the seat to its normal position after the weight has been removed. In some instances one of these devices—the weight 41 or the spring 39—may be dispensed with, and it might be possible to so construct the closet and its operating mechanism as to dispense with both.

A small petcock 42 is attached to the air-

cylinder, by which the escape of air therefrom is regulated, thereby providing means for regulating the speed of the descent of the piston-rod and the duration of the flush.

The operation of the device is as follows: The seat being depressed the lever 10 is partially rotated, elevating the piston-rod, substantially as shown by the arrow V in Fig. 7, and turning the angle portion in the upper portion of the valve-operating lever to one side sufficiently to permit the enlarged portion of the piston-rod to pass without moving said lever to open the valve, as shown in said Fig. 7. Upon the removal of the weight from the seat the spring 39 and counterweight 41 automatically return the seat and piston to their normal positions, the speed of the descent of the piston being regulated by the rapidity with which the air in the air-chamber escapes through the petcock. At the beginning of the descent of the piston (see Fig. 8, in which the piston-rod is shown in its elevated position in full lines and in a partially-lowered position in dotted lines) the inclined lower edge of the enlarged portion moves on the friction-roller and presses the valve-operating lever inwardly, which in turn presses the rod 29 inwardly and opens the valve.

The operation will be clearly understood by reference to Figs. 7 and 8 of the drawings, the piston in Fig. 7 being shown in full lines in its lower position and traveling upward in the direction of the arrow V, a partially-elevated position being shown in dotted lines, and the piston-rod being illustrated in Fig. 8 in its elevated position in full lines and descending in the direction of the arrow X, a partially-lowered position being shown in dotted lines, with the valve-operating lever moved to one side sufficiently to open the valve and permit the water to flow in.

A slot 43 in the flange 7 forms a slideway for the pin 13 to permit the seat to be moved.

We claim as our invention—

1. In a direct-pressure water-closet, the combination with the bowl, of a seat normally held in a slightly-elevated position, a water-flushing pipe extending into said bowl, a valve connected to said pipe and normally in a closed position, an air-chamber, a piston-rod extending into said air-chamber having an enlarged portion, a lever connected to the seat and the piston-rod, and an operating valve-lever provided with a pivotal portion having a limited range of movement, and adapted to be moved to provide a passage for the enlarged portion of the piston-rod when said rod is moving upward, and to be rigid in its position to force said piston-rod to move the valve-operating lever sufficiently to open the valve and flush the closet when said rod is moving downward, as set forth.

2. In a direct-pressure water-closet, the combination with the bowl, of a seat normally held in a slightly-elevated position, a water-flushing pipe extending into said bowl, a valve connected to said pipe and normally in a



closed position, a lever connected to the seat, a connecting-rod connected to said lever and having an enlarged portion provided with a substantially horizontal top edge and a diagonal bottom edge, and an operating valve-lever having a movable part projecting over the horizontal top edge of the enlarged portion and adapted to be moved by said enlarged portion to permit the elevation of the connecting-rod without moving said lever to open the valve upon the depressing of the seat and to be rigid in position to permit the diagonal edge to turn the lever to open the valve during the return movement of the connecting-rod, as set forth.

3. In a direct-pressure water-closet, the combination with the bowl, of a seat normally held in a slightly-raised position, a water-flushing pipe connected with said bowl, a valve connected to said pipe and normally in a closed position, an air-chamber, a piston-rod

extending into said air-chamber, having an enlarged portion, a lever connected to the seat, and the piston-rod, an operating valve-lever provided with a pivotal portion having a limited range of movement and adapted to be moved to provide a passage for the enlarged portion of the piston-rod when said rod is moving upward, and to be rigid in its position to force said piston-rod to move the valve operating-lever sufficiently to open the valve and flush the closet when said rod is moving downward, and a petcock for regulating the volume of the air-flow from the air-chamber and the duration of the flushing operation, as set forth.

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