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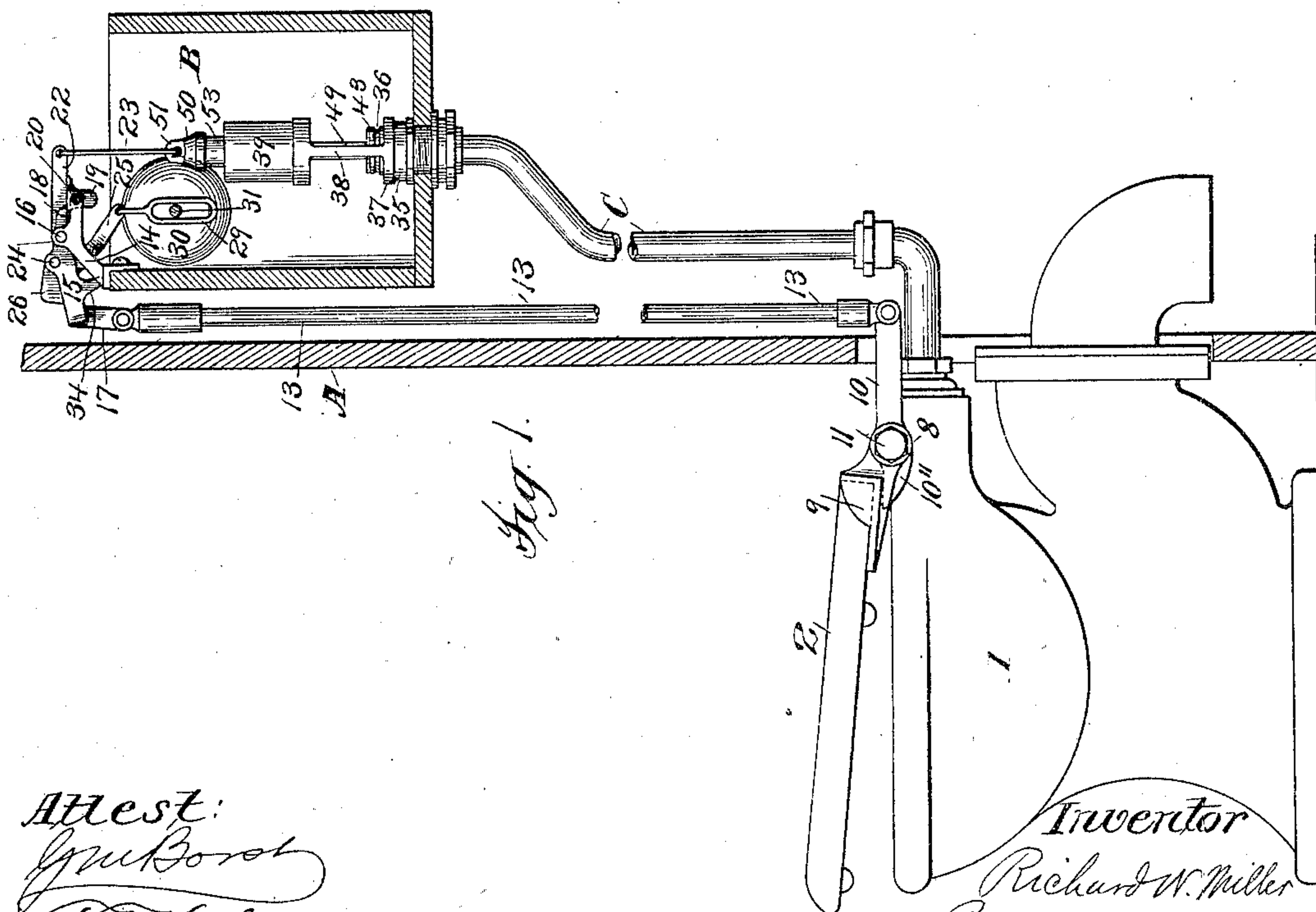
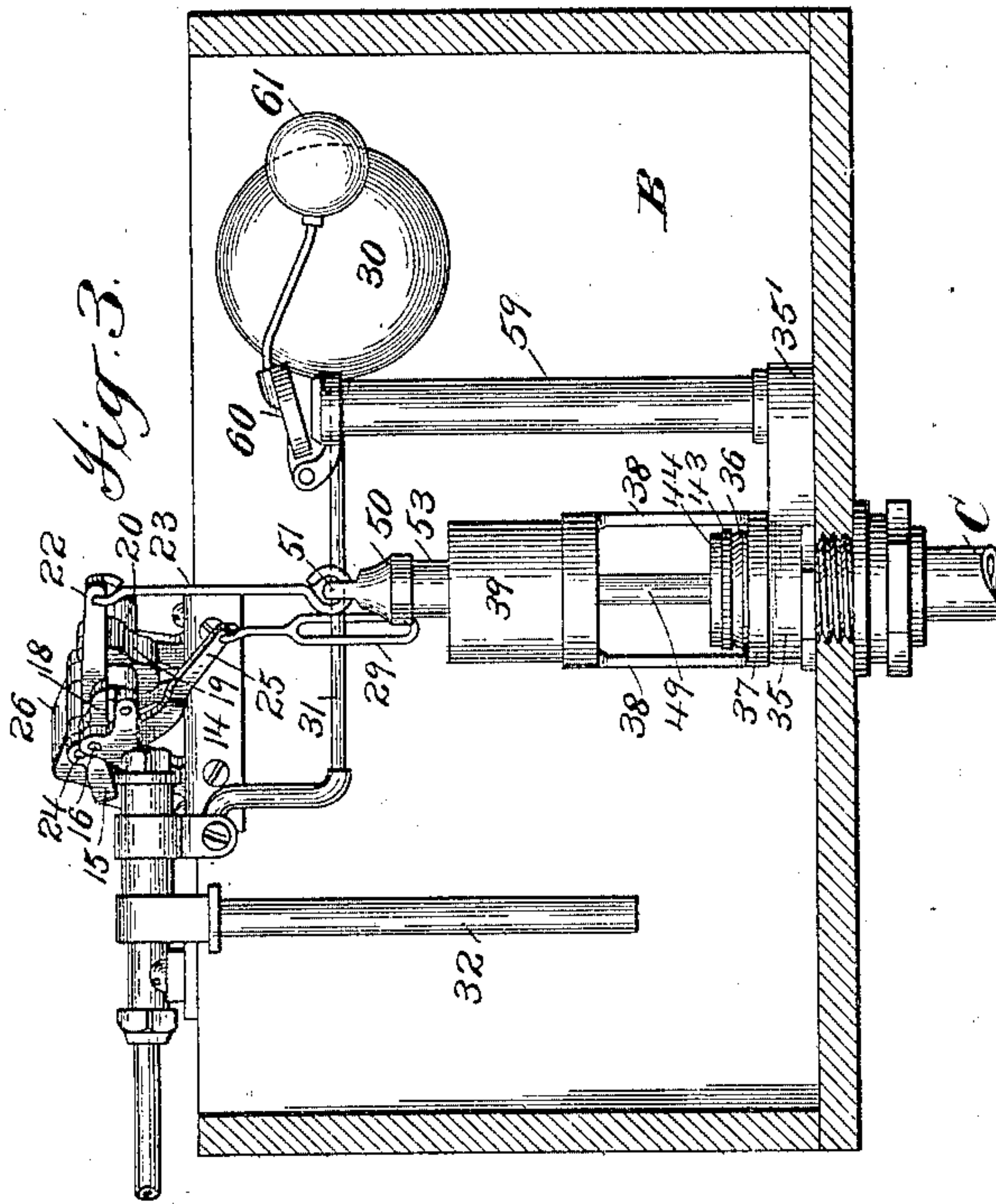
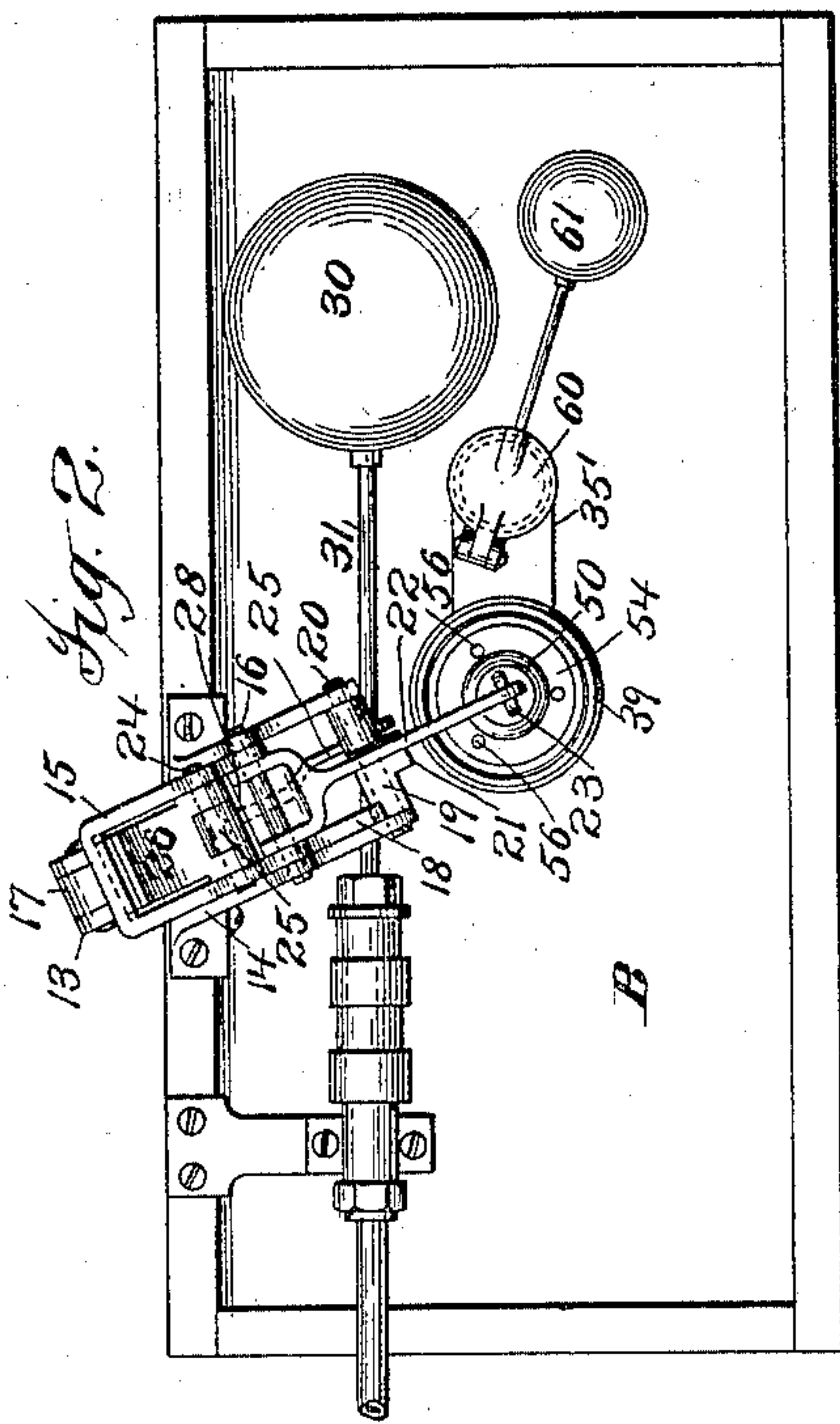
PATENTED APR. 14, 1903.

R. W. MILLER.  
WATER CLOSET.

APPLICATION FILED OCT. 20, 1898.

NO MODEL.

2 SHEETS—SHEET 1.



Attest:  
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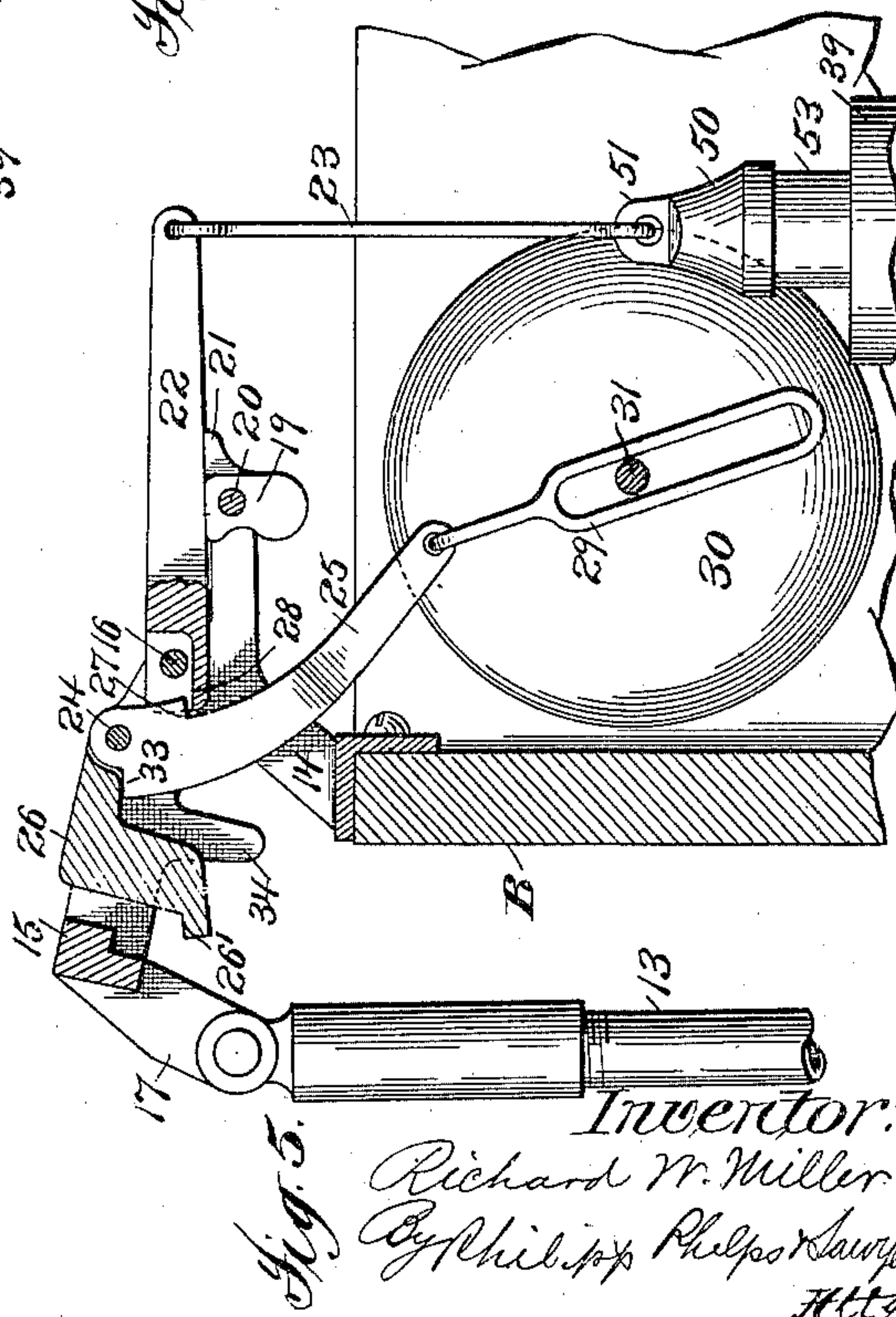
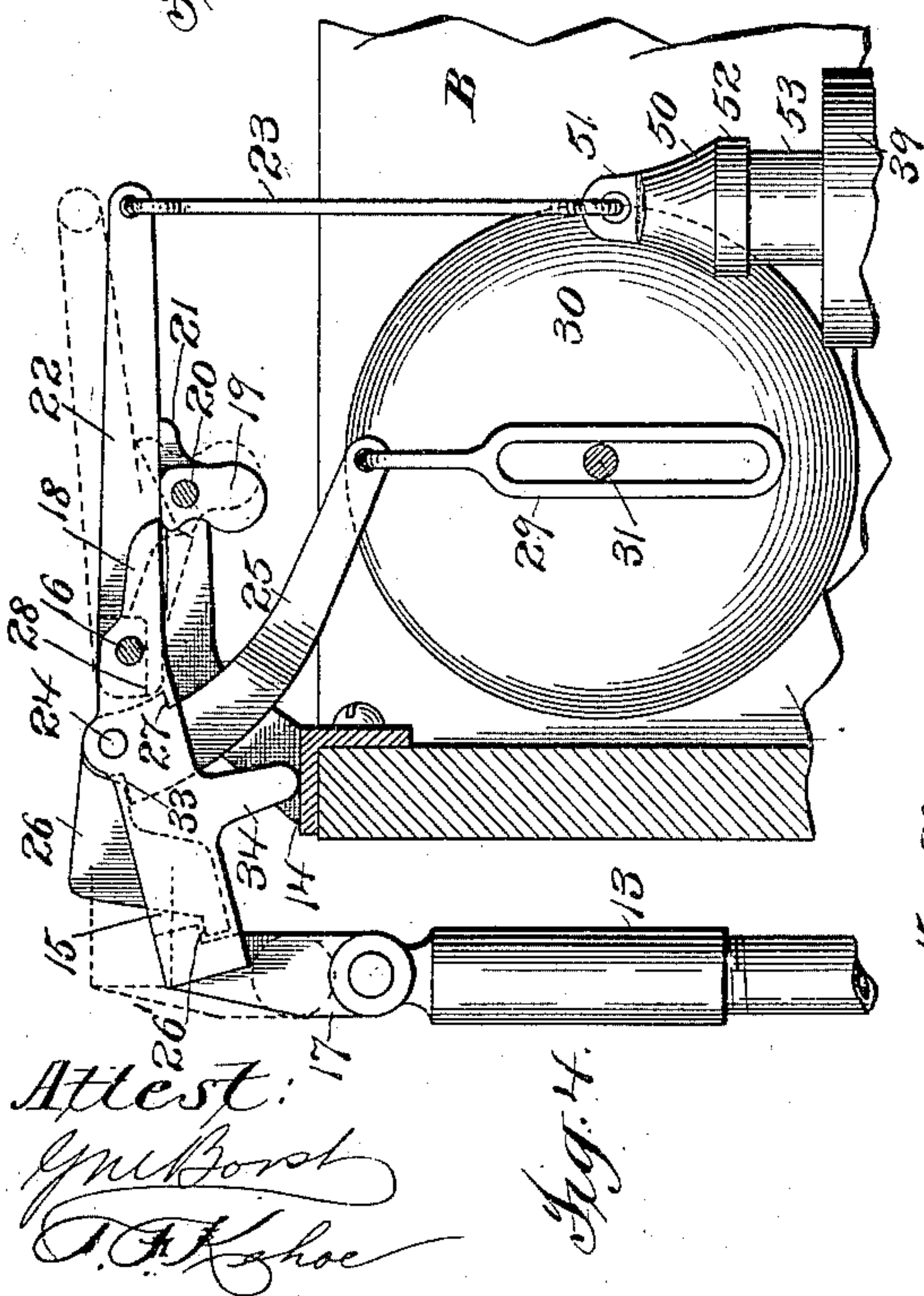
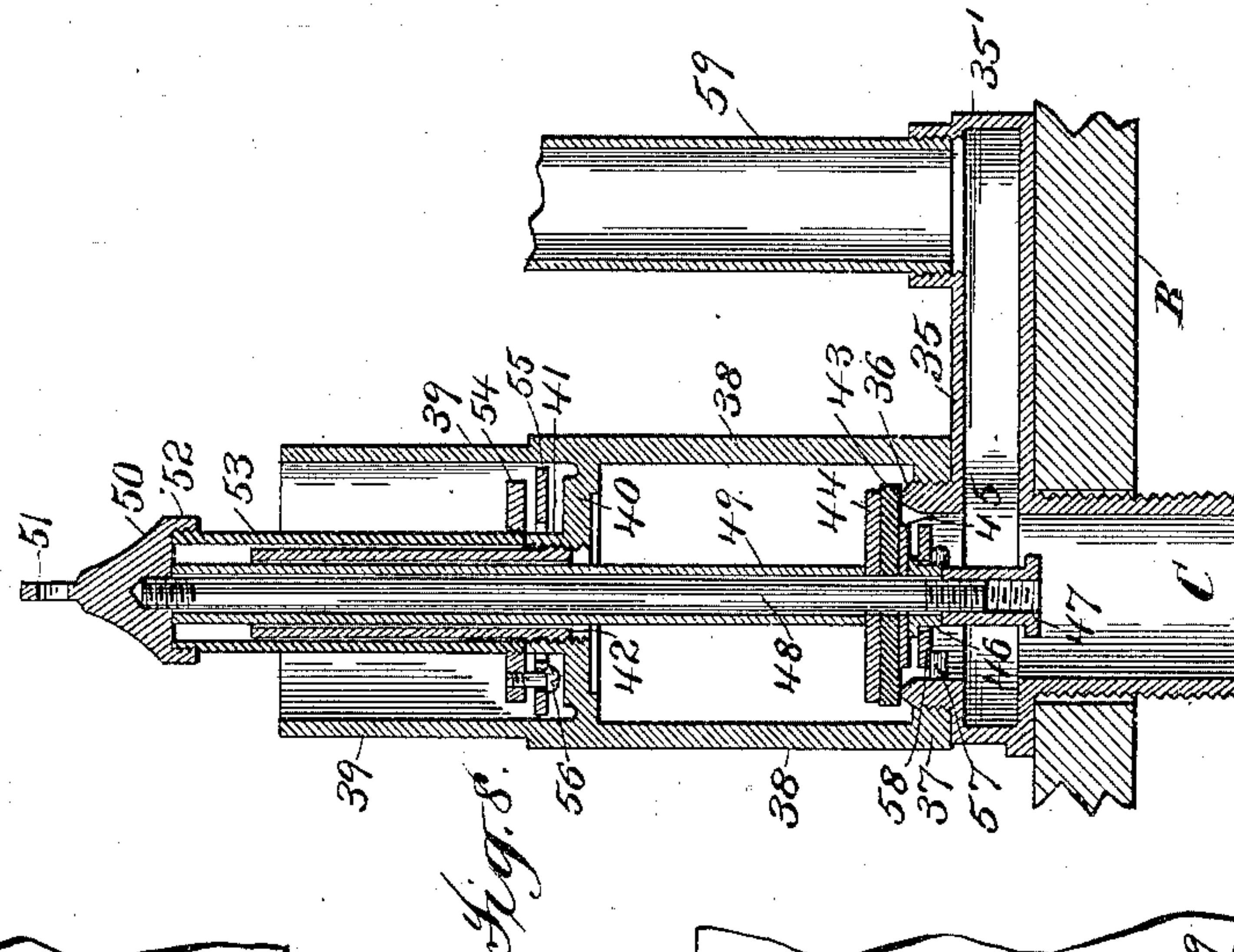
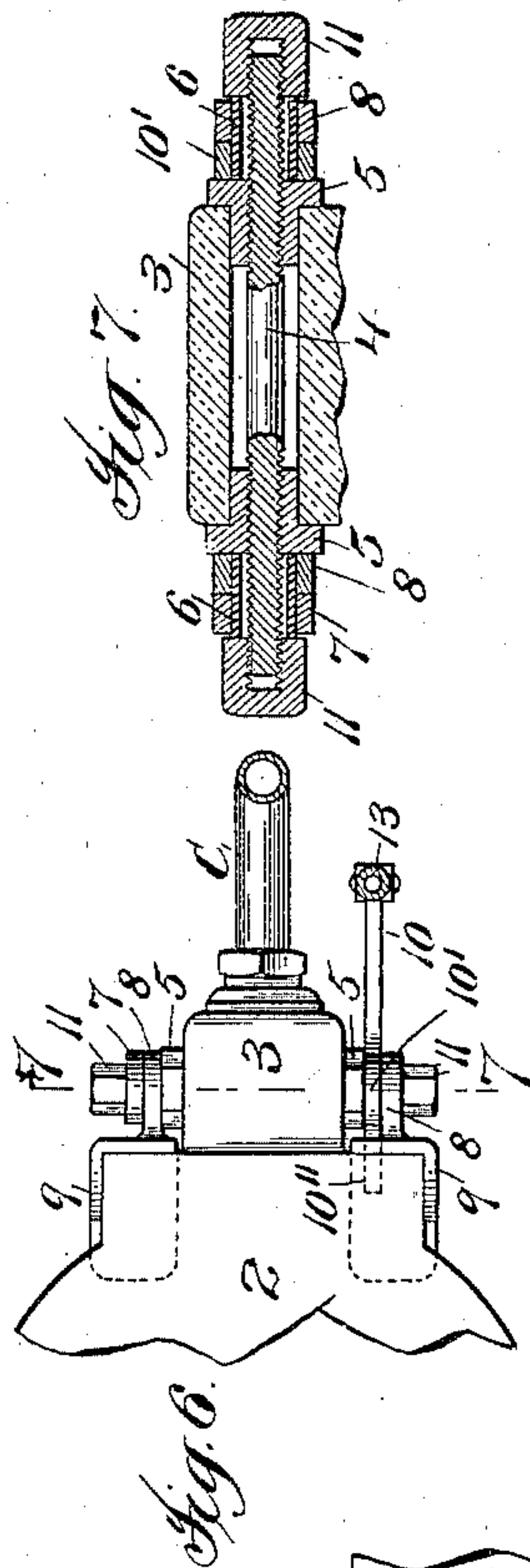
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NO MODEL.

2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

RICHARD W. MILLER, OF RUTHERFORD, NEW JERSEY, ASSIGNOR TO THE MEYER-SNIFFEN COMPANY, LIMITED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 725,268, dated April 14, 1903.

Application filed October 20, 1898. Serial No. 694,108. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD W. MILLER, a citizen of the United States, residing at Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Water-Closets, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to certain improvements in valve-controlling mechanism for the flush-tanks of water-closets.

The invention has for its object to produce an improved mechanism controlled by the seat 15 of the closet which when the seat is released after use shall act to automatically operate the valve of the flush-tank to allow a sufficient quantity of water to descend and flush the basin.

20 A further object of the invention is to produce an improved automatic mechanism which shall effect a slight preliminary flushing of the basin before use, such flushing being sufficient to dampen the basin, thereby 25 preventing the adherence of fecal matter thereto.

A further object of the invention is to produce an improved valve for use in flush-tanks which after it has been operated to permit a 30 flushing flow of water from the tank shall close gradually, thereby avoiding the slamming of the valve upon the seat and preventing noise and water-hammer in the pipes, and which after it has been operated to produce 35 a flushing flow of water shall not only automatically act to cut off the said flushing flow, but shall still operate to permit a slight subsequent flow of water from the tank, which while not sufficient in volume to produce a 40 flushing action shall operate as an after-fill, thereby insuring the presence of a sufficient quantity of water in the basin or the traps connected therewith, or both, to properly and effectually seal the waste-pipes.

45 With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, which will be hereinafter described and then specifically pointed out in the claims 50 hereunto appended.

In the accompanying drawings, which constitute a part of this specification, and in which like reference characters indicate the same parts, Figure 1 is a vertical section through a flush-tank, showing the valve-operating mechanism and the connections therefor, the basin of the closet and the actuating-seat being shown in elevation. Fig. 2 is a plan view, on a somewhat larger scale than Fig. 1, of the flush-tank and the devices contained therein. Fig. 3 is a vertical section of the flush-tank, also on a somewhat larger scale than Fig. 1, the plane of section being at right angles to that of said figure. Figs. 4 and 5 are enlarged detail views of the mechanism for operating the valve, the parts being shown in different positions in these views. Fig. 6 is a detail plan view showing the construction by which the seat is hinged and the connection of the operating-rods to the seat. Fig. 7 is a section on the line 7 7 of Fig. 6 looking in the direction of the arrow; and Fig. 8 is a vertical central section, on an enlarged scale, taken through the valve and showing the connection of the overflow-pipe thereto.

Referring to the drawings, 1 indicates the basin of a closet of the wash-down type, and 2 indicates the seat of said basin. The seat is connected to the basin by a hinge connection of any suitable form. In order to provide for this hinge connection, the basin is provided with a bearing, which preferably consists of a perforated projection or shoulder 3, Figs. 6 and 7, which in the preferred form of the construction is integral with the basin. The seat-hinges are formed by collars 8, having suitable extensions, to which the seat is secured in any suitable or desired manner. In order to support the seat hinges or collars 8, a rod 4 is provided, which passes through the perforated shoulder 3. This rod is preferably smaller in cross-section than the diameter of the perforation and is supported in hollow sleeves or nuts 5 at opposite sides of the shoulder 3, which extend inside the perforation, with heads on the sleeves or nuts abutting against the shoulder. In the preferred form of the construction sleeves 6 are provided, which are passed over the ends of 100



the rod 4 and are supported thereon. These sleeves when employed are slightly larger in diameter than the rod, and therefore fit loosely thereon. These sleeves serve to support the hinge-collars 8 of the seat. The rod 4, before referred to, also preferably serves to support an operating-arm 10, which, as will hereinafter appear, serves to effect the operation of the valve mechanism of the flush-tank. This arm 10 is preferably provided with an enlargement 10', which is perforated and surrounds one of the sleeves 6 when the same are employed. One end 10'' of the arm extends under the seat, as shown in Fig. 1, so that as the seat is depressed the arm will turn upon its pivot. The arm 10 is located next to one of the hinged collars 8, and in order to produce a symmetrical appearance and also to enable the arm 10 to be located on either side of the basin, as the exigencies of the case may require, a loose ring or collar 7 is placed on the rod on the side opposite to that on which the arm is located. The arm and collar may be transposed, when desired, without trouble and without producing an unsightly appearance.

In the preferred form of the construction the ends of the rod 4 are screw-threaded and are engaged by cap-nuts 11, which hold the parts securely in place. These nuts abut against the ends of the sleeves 6, and as these sleeves when used are slightly longer than the combined length of the hinge 8 and the width of the perforated enlargement 10' on one side and of the collar 7 and the hinge 8 on the other side the nuts can be screwed down against the ends of the sleeves, so as to hold the parts firmly in position without causing them to bind, thereby allowing the free movement of the arm and hinges on the collars.

While the construction which has just been described is the preferred form of hinge connection, it may be varied, if desired.

Connected to the arm 10 is a rod 13, which is preferably weighted or made sufficiently heavy to act as a weight. This rod extends upward and is connected to the valve-operating mechanism for the flush-tank B. It may be here remarked that the flush-tank and operating mechanism therefor are shown in Fig. 1 as concealed behind a partition A. This partition may obviously, however, be omitted, thereby exposing the flush-tank and the operating mechanism to view.

Located upon the upper edge of one side of the flush-tank is a bracket 14, which is preferably provided with two arms projecting over the interior of the tank. An actuating-lever 15, preferably, but not necessarily, U-shaped, is pivoted between the two arms of this bracket on a short shaft 16, which is supported at each end in the bracket-arms. The actuating-lever is provided with a downward extension 17, to which the rod 13 is connected. One of the sides of the actuating-lever is formed to provide an extension 18, which

projects forward beyond the pivot 16. This forwardly-projecting extension 18 of the actuating-lever engages a weighted toe 19, which toe is pivoted between the arms of the bracket 14 at the forward ends thereof, the pivots being indicated at 20. This toe is further provided with a forwardly-extending projection 21, the purpose of which will be hereinafter stated.

Pivoted on the short shaft 16, before referred to, is the valve-operating lever 22, this being a lever of the third order. This lever is connected by a link 23 to the valve and passes over and normally preferably rests upon the extension 21 of the weighted toe 19, before referred to.

When the seat is depressed and the arm 10 rocked as before described, the rod 13 is given a vertical movement, and the actuating-lever is rocked on the short shaft 16. The arm 10 and rod 13, although pivoted together, form a substantially rigid connection between the seat and the actuating-lever, by which the movement of the seat is transmitted to the lever. This movement causes its forward extension to strike the inner side of the pivoted toe 19, thereby rocking it on its pivots 20. This movement causes the extension 21 of the toe to rise and carry with it the lever 22, which movement raises the valve to which the lever 22 is connected by means of the rod 23. As is apparent from the drawings, however, (see, for instance, Fig. 4,) any considerable movement of the actuating-lever will cause its extension 18 to rock the pivoted toe 19 sufficiently so that the end of the lever 18 will pass it. As soon as the end of the lever 18 has passed the toe 19 this toe, being weighted, as before stated, will rock back into its original position, allowing the lever 22 to return to its normal position and the valve to close. This operation of the valve, however, has been sufficient to allow a small amount of water to escape from the flush-tank, and this water descending through the pipe C into the bowl gives it a preliminary wetting or dampening, so that any matter therein deposited will not readily adhere to the sides of the bowl.

The actuating-lever 15 has extending through it a short rod 24, this short rod being located back of the pivotal point of the lever. Pivoted to this short rod 24 are a latch or trigger-lever 25 and a weight 26, the latch being preferably pivoted between ears on the weight 26. (See Fig. 2.) The trigger-lever or latch 25 has a forwardly-projecting shoulder 27, which in certain positions engages a shoulder 28, formed on the lever 22, and a rearwardly-projecting shoulder 33, upon which the weight 26 rests.

The latch or trigger-lever 25 is connected by a slotted link 29 to the usual float 30, the said float being connected by a rod 31 to the inflow-valve, by which water is admitted into the flush-tank through the pipe 32. As the float descends said valve is operated and al-



lows the water to flow into the tank through the pipe 32. The connection between the float and the inflow-valve and the construction of said valve may be of any usual or ordinary type, and it is not, therefore, necessary to illustrate the same or describe it further.

The weight 26 is preferably provided with a shoulder 26', which is or may be engaged at times by the outer end of the actuating-lever 15. (See Figs. 4 and 5.) The actuating-lever 15 is also provided with a downwardly-projecting stop 34, which limits its downward movement.

When the seat is depressed, the rod 13 is given its vertical movement upward and the outer end of the actuating-lever 15 rocks upwardly, as before described. By this movement the extension 18 of the actuating-lever is caused to operate the toe 19, thus giving the valve its preliminary opening, and the outer end of the lever is pushed up into the position shown in Fig. 5. By this movement the trigger-lever 25 is carried upward to a point where its shoulder 27 is above the shoulder 28 on the valve-operating lever 22. As soon as the shoulder 27 on the lever 25 clears the shoulder 28 the weight 26, operating on the shoulder 33 of the lever 25, will swing the said lever inward and cause the shoulder 27 to engage or stand above the shoulder 28, this position of the parts being clearly shown in Fig. 5. By this movement of the trigger or latch the actuating-lever and the valve-operating lever are locked together, and since they have the same pivotal point they operate thereafter as a single lever. In other words, the latch or trigger constitutes a locking device, by the interposition of which the valve-operating lever and the actuating-lever are practically converted into a single lever, said lever being connected at one end to the seat and at its other end to the valve. The parts remain in the position shown in Fig. 5 so long as the seat is maintained in its depressed position. When, however, the weight is removed from the seat, the weighted rod 13 will descend, carrying with it the actuating-lever 15, which, so far as the work done by it on the operating-lever, is a lever of the second order. Since the trigger or latch is mounted in the actuating-lever, and by reason of the fact that its shoulder 27 has engaged the shoulder 28 of the lever 22 and has locked the actuating-lever to the lever 22, both levers are rocked about the pivot on which they are both pivoted and the valve is raised. The movement produced by the weighted rod 13 when the weight is removed from the seat, therefore, is transmitted to the valve practically through a single lever, thus forming a simple and direct means for transmitting the power. The downward movement of the actuating-lever will continue until its stop 34 strikes the bracket 14, to which the lever is pivoted, by which movement of the parts the valve is raised to its full extent, and the wa-

ter is allowed to escape from the flush-tank down through the pipe C, thereby flushing the closet. As the water escapes from the closet the float 30 descends. The position of the various parts of the valve-operating mechanism remains as above described until the rod 31 strikes the bottom of the slot in the link 29, which connects the lever 25 to the float. When the float has reached this position, its further downward movement operates through the link 29 to pull the trigger-lever downward and backward, thereby releasing its shoulder 27 from its engagement with the shoulder 28 on the lever 22. As soon as this occurs the valve is free to close, and does so, the lever 22 resuming the position shown in Fig. 4, with its shoulder 28 above the shoulder 27 of the trigger-lever 25. The parts now being in their normal condition are ready to be again operated in the manner before described to flush the closet, as before described.

It is of course understood that the descent of the float 30 opens the inflow-valve of the flush-tank and that the tank has become filled through the pipe 32.

While the apparatus before described may be used with any desired form of valve, the valve is preferably constructed so that its movement in closing will be automatically controlled, so as to avoid noise and any slamming of the valve against the seat, and also the construction of the valve is preferably such as to provide for a slight flow of water after the flushing action proper has ceased, thereby providing for an after fill and insuring that sufficient water to form a proper seal flows into the basin or traps, or both. To accomplish these objects, the valve is preferably constructed as follows: A casing 35 is provided, which carries valve-seat 36. The valve-seat 36 is surrounded by the ring 37, which engages suitable threads formed on the outer portion of the upward projection on which the valve-seat is formed. Two legs or extensions 38 connect the ring 37 to an upper annular chamber or casing 39. The bottom of the chamber 39 is formed by a web 40, having an upward projection 41, into which is screwed or to which is otherwise secured an upwardly-extending tube 42. The casing 39, the web 40, and the upwardly-extending tube 42 form an annular chamber the top of which is below the normal level of the water in the flush-tank and which is therefore filled with water.

43 indicates a leather or elastic plate forming part of the valve proper, which plate rests upon the valve-seat 36. This plate 43 lies between washers 44 45. A shouldered collar 46 bears against the washer 45. The plate 43, the washers 44 45, and the collar 46 fit somewhat loosely on a rod 48, which forms the valve-stem. The collar 46 is engaged by a shouldered nut 47, which is screwed upon the lower end of the valve-stem 48. Surrounding the stem 48 and bearing against the



washer 44 is a tube 49, the upper end of the tube being engaged by a nut 50, which nut is threaded onto the upper end of the rod 48. The several parts of the valve are thus held in firm adjustment on the stem by the two nuts 47 and 50. The upper end of the said nut 50 is provided with a loop 51, which is engaged by the link 23 of the valve-operating mechanism before described. The nut 50 has a downwardly-projecting threaded shoulder 52, and to this shoulder is connected a threaded tube 53. This tube has secured to its lower end, by means of a thread or in any other suitable manner, a plate 54, which plate is somewhat less in diameter than the annular casing 39. Lying below the plate 54 is a second perforated plate or annulus 55, which surrounds the upwardly-extending threaded portion of the bottom 40, the diameter of its central opening being somewhat greater than the diameter of said upwardly-projecting extension. This perforated plate or annulus is nearly as large as the diameter of the casing 39, but is of a sufficient size to work freely therein, and it is loosely connected in any suitable manner, as by headed bolts 56, to the plate 54, it being free to play up and down on the bolts. It being remembered that the casing 39 is normally filled with water, it will be seen that when the valve is raised by means of the valve-operating mechanism before described the plate 54 and the annulus 55 will be carried upward in the chamber 39, and the annulus will by the action of the water in the casing be forced downward against the heads of the bolts 56. The water in the casing will therefore flow between the plate and the annulus and through the opening in the center of the annulus and between it and the upwardly-projecting tube 42 into the lower part of the casing. A portion of the water which is contained in the casing may be forced out over its upper edge by the upward movement of the plate and the annulus; but should this occur inasmuch as the top of the casing is located somewhat below the normal level of the water in the tank as soon as the upward movement of the plate and annulus has ceased sufficient water will run in to fill the casing. When the valve-operating mechanism is released, as before described, the valve is free to seat itself. The first movement of the valve in the downward direction will cause the annulus 58 to be forced upward against the plate 54. The plate 54 will now act to close the opening between the annulus and the tube 42, and the water which is in the casing will act as a cushion and resist the downward movement of the valve. The valve, therefore, can move downwardly only so fast as the escaping water will permit, and as the water can only escape around the edges of the annulus 55 and between it and the sides of the casing 39 the downward movement of the valve will necessarily be slow, thereby avoiding any sudden closing or slamming of the valve.

The valve-seat 36 is provided with a series of inwardly-extending studs 57. These studs act to support an annulus 58, which is carried by the valve and which is free to move between the shoulder on the collar 46 and the shoulder on the nut 47. As the valve is raised the annulus 58 will be carried forward clear of the opening through the valve-seat and allow an unobstructed flow of water into the pipe C. When, however, the valve starts to move in its downward direction, as soon as the annulus 58 reaches its supporting-pins 57 it will be stopped by them. It will at this time, therefore, act to partially close the opening through the valve-seat and so diminish the flow of water as to cause the flushing action to cease. Water will still continue to flow around this annulus in a diminished quantity until the valve proper comes to place on its seat, and this afterflow, while not sufficient to cause a "flushing action," properly so called, will act to fill the basin or trap, or both, and so insure a proper water seal.

The casing 35 is provided with a lateral hollow extension 35', to which is secured an upwardly-extending overflow-pipe 59.

Various modifications may be made in the mechanism, and various parts are capable of use independently of the other parts and in relations other than that herein set forth. For instance, the actuating-lever 15 may be made straight instead of U-shaped. The weight 26 may be omitted altogether and the latch itself weighted in such a manner that it will of itself engage the valve-operating lever. The connections between the seat and the actuating-lever may be varied, and in general many other obvious modifications, which it is not necessary to specifically state, may be made. The invention is not, therefore, to be limited to the specific details of construction herein described, but is to be regarded as generic in its nature and as including all modifications which come within its spirit and scope.

What I claim is—

1. The combination with a flush-tank, of a valve, an operating-lever therefor, connections between the lever and the valve, an independent actuating-lever, said lever being arranged so that its power end moves in the same direction as the power end of the operating-lever when the valve is to receive its main opening movement, locking devices which operate to connect the two levers when the valve is to be raised, means for disconnecting the locking devices when the valve is to be closed, and means connected to the power end of the actuating-lever to move it in both directions, substantially as described.

2. The combination with a closet having a movable seat, of a flush-tank, a valve, an operating-lever therefor, connections between the lever and the valve, an independent actuating-lever, said lever being arranged so that its power end moves in the same direction as the power end of the operating-lever



when the valve is to receive its main opening movement, locking devices which operate to connect the two levers when the valve is to be raised, means for disconnecting the locking devices when the valve is to be closed, and connections between the closet-seat and the power end of the actuating-lever, substantially as described.

3. The combination with a flush-tank, of a valve, a pivoted operating-lever therefor, an independent pivoted actuating-lever, said lever having the same pivotal point as the operating-lever, locking devices which serve to connect the two levers when the valve is to be raised, means for operating the locking devices to disconnect the two levers when the valve is to be closed, and means connected to the power end of the actuating-lever for operating it in both directions, substantially as described.

4. The combination with a flush-tank, of a valve, a pivoted valve-operating lever therefor, an independent pivoted actuating-lever, said lever having the same pivotal point as the operating-lever, locking devices carried by one of the levers which serve to connect the two levers when the valve is to be raised, means for operating the locking devices to disconnect the two levers when the valve is to be closed, and means connected to the power end of the actuating-lever for operating it in both directions, substantially as described.

5. The combination with a flush-tank having a valve therein, of a valve-operating lever, an actuating-lever, a latch carried by said lever and constructed in one position to engage the valve-operating lever, an operating-rod connected to the actuating-lever and acting to move it in both directions whereby a movement of the said rod in one direction causes the latch to engage the lever and a movement in the opposite direction operates the valve-operating lever and opens the valve, and latch-releasing devices, substantially as described.

6. The combination with a flush-tank having a valve therein, of a valve-operating lever, an actuating-lever, a latch carried by said lever and constructed in one position to engage the valve-operating lever, a weighted operating-rod connected to the actuating-lever and acting to move it in both directions whereby a movement of the said rod in one direction causes the latch to engage the lever and a movement in the opposite direction operates the valve-operating lever and opens the valve, and latch-releasing devices, substantially as described.

7. The combination with a movable closet-seat, of an actuating-rod and means whereby this rod is moved by the movement of the seat, a flush-tank and valve therein, a valve-operating lever pivoted between its ends, an actuating-lever connected to the operating-rod, and a latch carried by the actuating-lever for engaging the valve-operating lever, said latch being located between the point of

connection of the rod and lever and its pivotal point, substantially as described.

8. In a flush-tank, the combination with a valve-operating lever, of a pivoted actuating-lever, a latch pivoted on said lever, a weight pivoted on the actuating-lever independently of the latch, a shoulder on the valve-operating lever with which the latch engages, means for operating the actuating-lever to cause the latch to engage the valve-operating lever, and means controlled by the height of the water in the tank for causing the latch to release the valve-operating lever, substantially as described.

9. In a valve-operating mechanism for flush-tanks, the combination with a valve-operating lever, of an actuating-lever having an extension, a pivoted toe lying in the path of the extension and serving when actuated to operate the valve-lever, a latch for engaging the valve-operating lever, means for operating the actuating-lever whereby the valve is given a slight preliminary movement to allow the escape of a small quantity of water, and the latch is caused to engage the lever so that further movement of the actuating-lever will cause the operation of the valve, and means controlled by the height of water in the tank causing the latch to release the valve-operating lever, substantially as described.

10. The combination with a closet having a movable seat, of a flush-tank, a valve-operating lever for controlling the tank-valve, an actuating-lever having an extension, connections between said actuating-lever and the closet-seat, a pivoted toe lying in the path of the extension, a latch for engaging the valve-operating lever, a weight for engaging the latch, said latch and weight lying between the arms of the actuating-lever whereby the downward movement of the seat will cause the extension to strike the pivoted toe and permit a slight preliminary operation of the valve allowing the escape of a small quantity of water and the movement of the seat in the opposite direction to actuate the valve-lever to operate the valve, substantially as described.

11. The combination with a closet having a movable seat, of a flush-tank, a valve-operating lever for controlling the tank-valve, an actuating-lever having an extension, connections between said actuating-lever and the closet-seat, a pivoted toe lying in the path of the extension, a latch for engaging the valve-operating lever carried by the actuating-lever, means controlled by the height of the water in the tank for causing the latch to release the valve-operating lever, whereby the downward movement of the seat will cause the extension to strike the pivoted toe and cause a slight preliminary operation of the valve allowing the escape of a small quantity of water, and the movement of the seat in the opposite direction will actuate the valve-lever to operate the valve, substantially as described.



12. The combination with a closet having a movable seat, of a flush-tank, a valve-operating lever for controlling the tank-valve, an actuating-lever having an extension, connections between said actuating-lever and the closet-seat, a pivoted toe lying in the path of the extension, a latch for engaging the valve-operating lever carried by the actuating-lever, a weight also carried by the actuating-lever for engaging the latch and means controlled by the height of the water in the tank for causing the latch to release the valve-operating lever, substantially as described.

13. The combination with a flush-tank, of a bracket secured thereto, a valve-operating lever pivoted in the bracket, an actuating-lever also pivoted in the bracket and having an extension, a toe pivoted in the bracket and lying in the path of the extension on the said actuating-lever, a latch pivoted on the actuating-lever, a weight for operating the latch in one direction, a shoulder on the latch, means controlled by the height of water in the tank for causing the latch to release the valve-operating lever, whereby the movement in one direction of said actuating-lever will operate the toe and cause a preliminary movement of the valve to allow the escape of a small quantity of water and the latch to engage the valve-operating lever, and the movement of the said actuating-lever in the opposite direction will cause the latch to operate the valve-operating lever to allow the usual escape of water from the tank, substantially as described.

14. The combination with a closet, of a flush-tank, a bracket secured thereto, a valve-operating lever pivoted in the bracket, an actuating-lever also pivoted in the bracket and having an extension, a toe pivoted in the bracket and lying in the path of the extension on the said actuating-lever, a latch pivoted on the actuating-lever, a weight for operating the latch in one direction, a shoulder on the latch, means controlled by the height of water in the tank for causing the latch to release the valve-operating lever, whereby the movement in one direction of said lever will operate the toe and cause a preliminary movement of the valve to allow the escape of a small quantity of water and the latch to engage the valve-operating lever, and the movement of said actuating-lever in the opposite direction will cause the latch to operate the valve-operating lever to allow the usual escape of water from the tank, substantially as described.

15. The combination with a closet having a movable seat, of a flush-tank, a bracket secured on the tank, a valve-operating lever pivoted in the bracket, an actuating-lever also pivoted in the bracket, connections between the actuating-lever and the movable seat, an extension on said actuating-lever, a pivoted toe lying in the path of the extension, a latch pivoted on the actuating-lever, a weight cooperating with the latch, a shoulder

on the latch for engaging the valve-operating lever, means controlled by the height of water in the tank for causing the latch to release the valve-operating lever, whereby the movement of the seat in one direction of said actuating-lever will operate the toe and cause a preliminary movement of the valve to allow the escape of a small quantity of water and the latch to engage the valve-operating lever, and the movement of the seat in the opposite direction will cause the latch to operate the valve-operating lever to allow the usual escape of water from the tank, substantially as described.

16. The combination with a closet having a movable seat, of a flush-tank, a bracket secured on the tank, a valve-operating lever pivoted in the bracket, a U-shaped actuating-lever also pivoted in the bracket, connections between the U-shaped lever and the movable seat, an extension on said U-shaped lever, a pivoted toe lying in the path of the extension, a latch pivoted between the arms of the U-shaped lever, a weight pivoted between the arms of the U-shaped lever cooperating with the latch, a shoulder on the latch for engaging the operating-lever and means controlled by the height of water in the tank for causing the latch to release the valve-operating lever whereby the movement of the seat in one direction will cause the extension of said U-shaped lever to operate the toe and cause a preliminary movement of the valve to allow the escape of a small quantity of water and the latch to engage the valve-operating lever and the movement of the seat in the opposite direction will cause the latch to operate the valve-operating lever to allow the usual escape of water from the tank, substantially as described.

17. The combination of a closet-basin having a perforated portion at the rear side, sleeves 5 at opposite sides of said perforated portion, rod 4 passing through said sleeves 5, sleeves 6 on said rod, nuts 11 on said rod engaging sleeves 6, and seat-hinges on said sleeves 6, substantially as described.

18. The combination of a closet-basin having a perforated portion at the rear side, sleeves 5 at opposite sides of said perforated portion, rod 4 passing through said sleeves 5, sleeves 6 on said rod, nuts 11 on said rod engaging sleeves 6, seat-hinges on said sleeves 6, and operating-arms 10 actuated by the seat and mounted on one of the sleeves 6, substantially as described.

19. The combination with a perforated shoulder, of a rod passing through the shoulder, a sleeve surrounding said rod, a collar surrounding said sleeve, said collar being shorter than the sleeve, a nut engaging the end of the rod whereby the nut may be screwed tightly down against the end of the sleeve without interfering with the free movement of the collar on the sleeve, substantially as described.

20. The combination with a perforated



shoulder, of a screw-threaded rod passing therethrough, nuts on the rod, sleeves loosely surrounding the rod, hinged collars surrounding the sleeves, the collars being slightly shorter than the sleeves which they surround and cap-nuts fitting the ends of the rod whereby said nuts may be screwed down firmly against the sleeves to hold the parts in place without interfering with the movement of the hinged collars, substantially as described.

21. The combination with a closet having a perforated shoulder, of a screw-threaded rod passing through the shoulder, nuts threaded on the rod and having extensions entering the perforated shoulder, a sleeve or collar surrounding the rod, a hinged seat, the hinges of the seat surrounding the collars or sleeves, a lever pivoted on one of the sleeves and having an extension projecting beneath the seat, nuts threaded on the ends of the rod and engaging the ends of the sleeves, a flush-tank and connections from the lever to the valve in the tank, substantially as described.

22. In a valve mechanism for flush-tanks;

the combination with a movable valve and stem therefor, a casing or chamber, an opening in said casing or chamber located beneath the normal level of the fluid in the tank, an opening in the bottom of the casing through which the valve-stem passes, an upwardly-extending sleeve connected to said bottom, a second sleeve connected with the valve-stem and inclosing the first-named sleeve, a plate connected to the second sleeve and making a tight joint therewith, an annulus loosely connected with said plate, the opening in the interior of the annulus being greater than the diameter of the sleeve, whereby the opening is formed between it and the sleeve, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

RICHARD W. MILLER.

Witnesses:

G. M. BORST,  
T. F. KEHOE.