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PATENTED JAN. 29, 1907.

J. BOWEY, JR.

CHEMICAL SOLUTION ELEVATOR FOR USE IN WATER PURIFIERS.

APPLICATION FILED SEPT. 8, 1905.

2 SHEETS—SHEET 1.

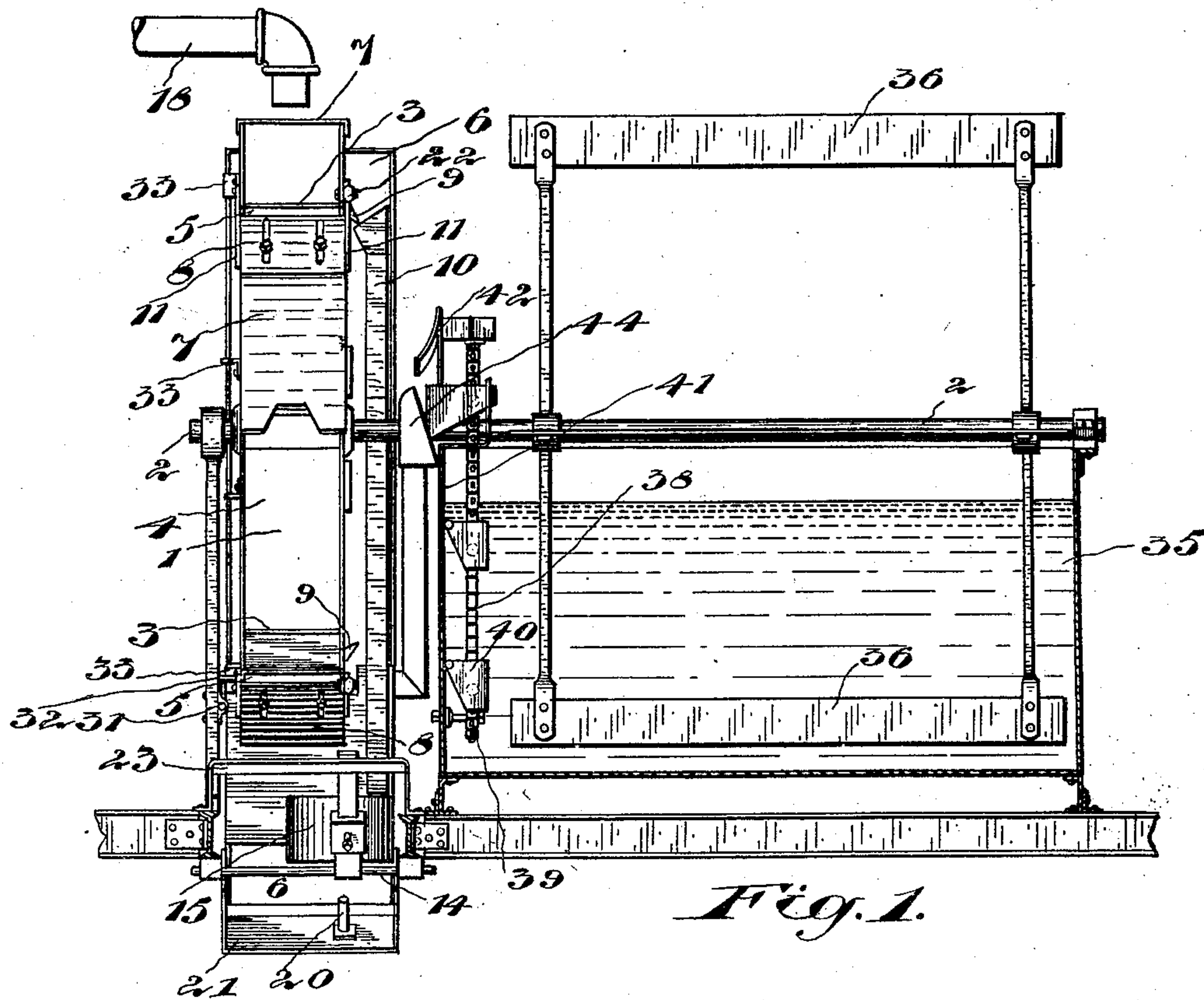


Fig. 1.

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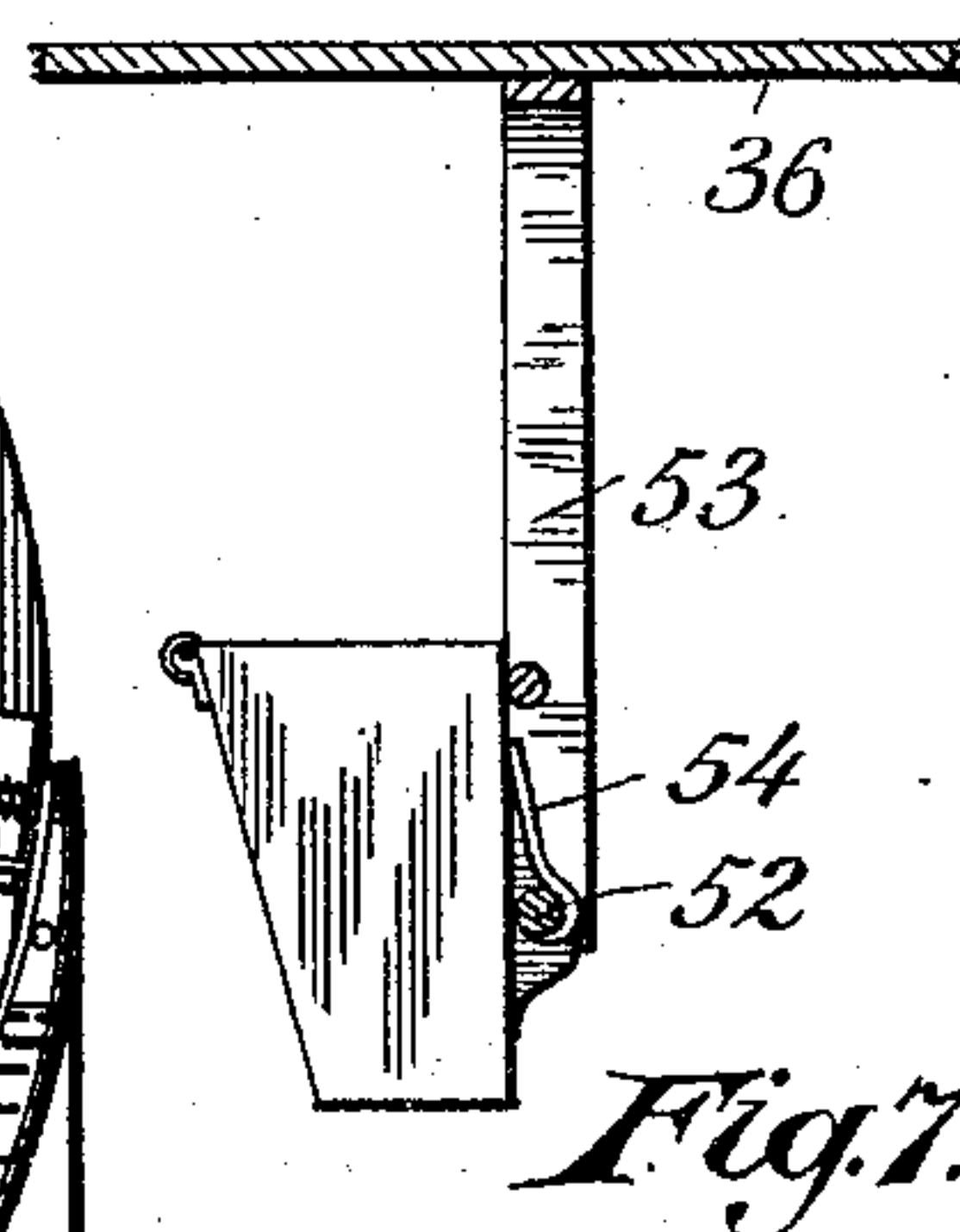
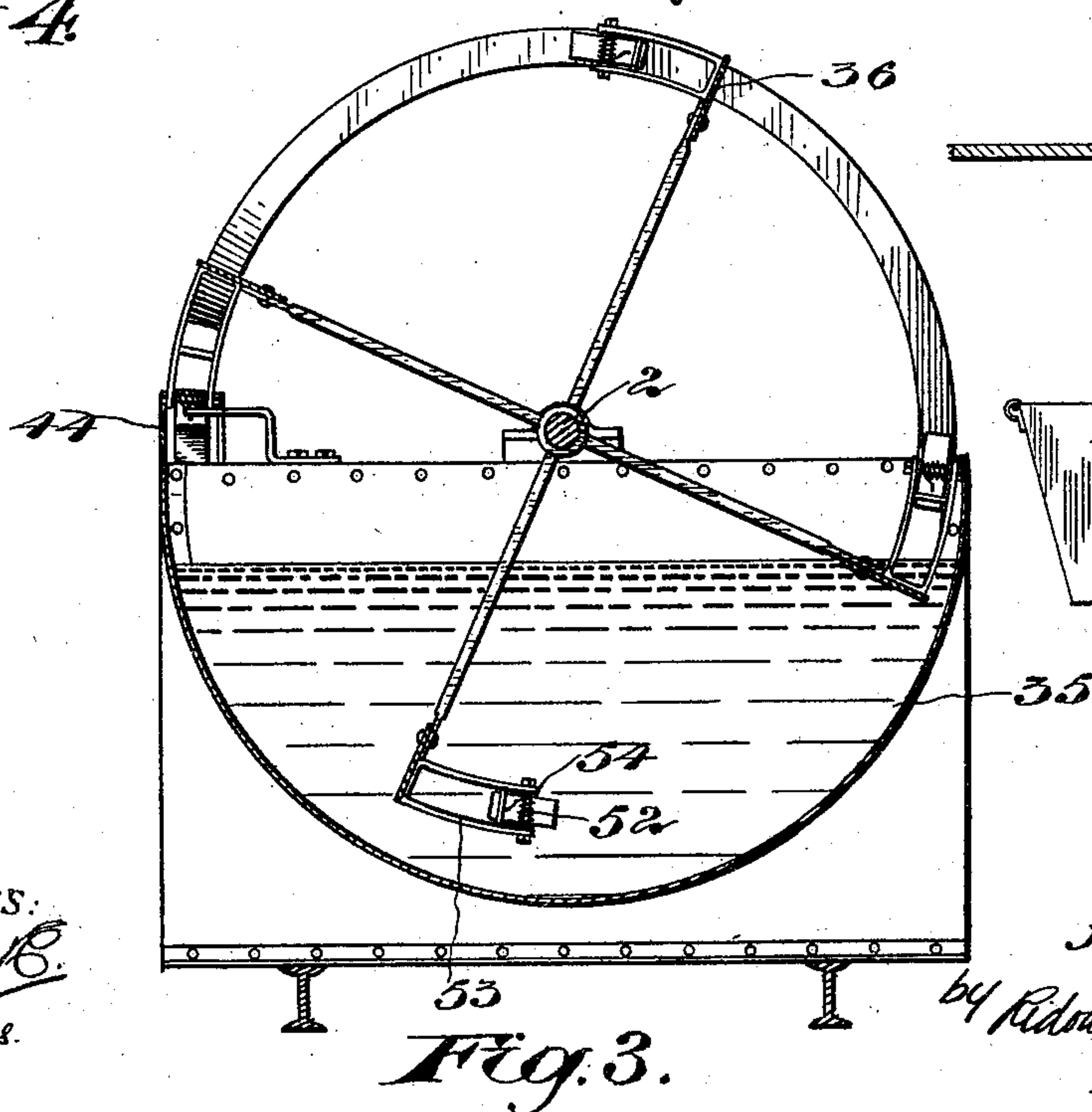
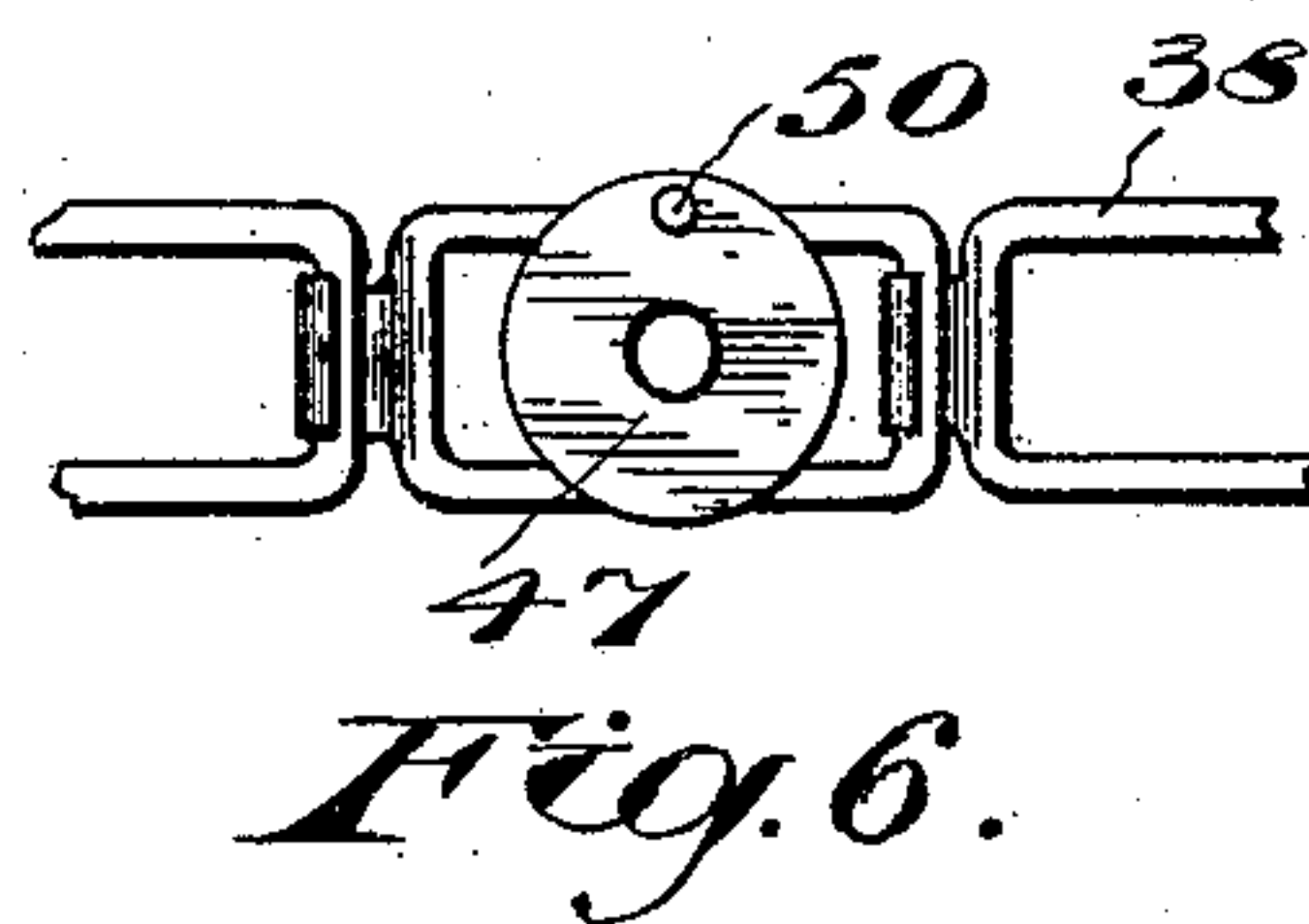
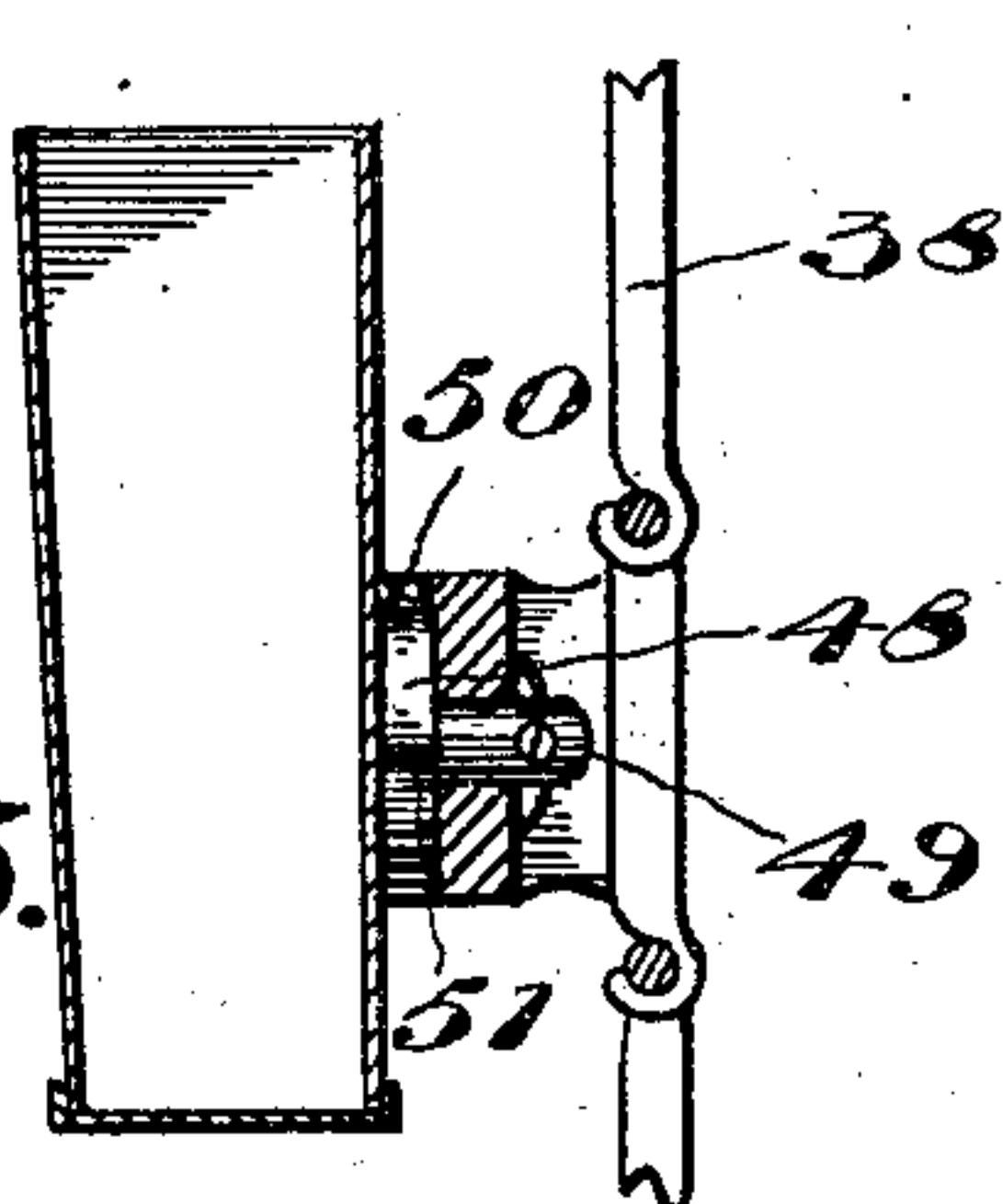
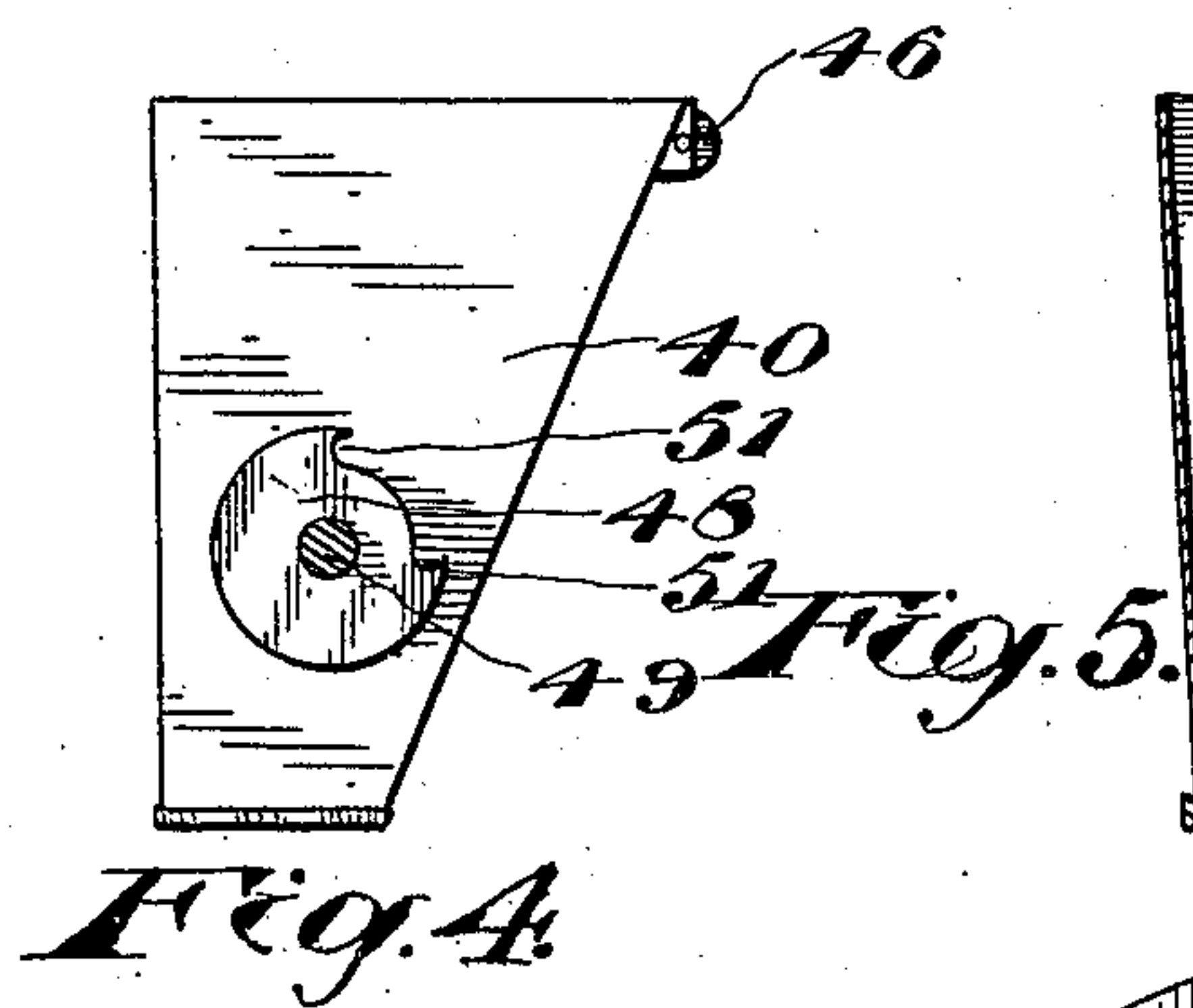
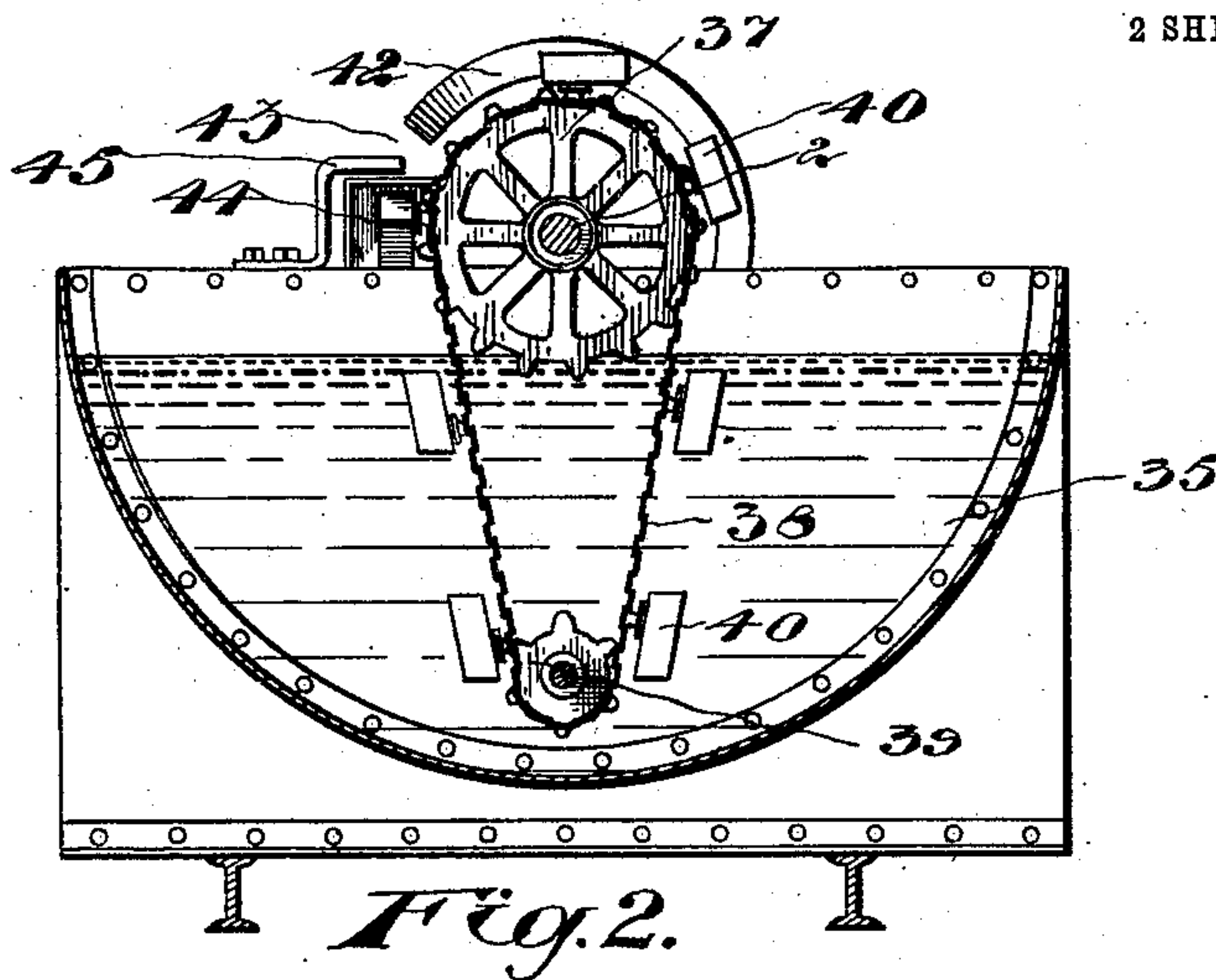
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2 SHEETS—SHEET 2.



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CHEMICAL-SOLUTION ELEVATOR FOR USE IN WATER-PURIFIERS.

No. 842,518.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed September 8, 1905. Serial No. 277,526.

To all whom it may concern:

Be it known that I, JOHN BOWEY, Jr., of the city of London, in the county of Middlesex, in the Province of Ontario, Canada, have
5 invented certain new and useful Improvements in Chemical-Solution Elevators for Use in Water-Purifiers, of which the following is a specification.

This invention relates to improvements in
10 apparatus for measuring and elevating a chemical solution for use with water-purifying apparatus in which water is automatically measured by intermittent rotary motion in one direction.

15 With this object in view my invention consists, essentially, in the constructions hereinafter specifically described and then definitely claimed.

Figure 1 is a side sectional elevation of my
20 improved apparatus. Fig. 2 is a cross-section of the chemical-solution holder. Fig. 3 is a similar view showing a modification of the lifting-cup. Fig. 4 is an elevation of the inner side of one of the cups shown in Fig. 3.
25 Fig. 5 is an end sectional elevation showing the method of pivoting the cup to one of the links of the chain. Fig. 6 is a plan view showing one of the links of the chain adapted to carry the cup. Fig. 7 is a sectional elevation showing the connection of one of the
30 cups shown in Fig. 4.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

35 1 is a rotatable water-receptacle secured to the shaft 2, suitably journaled on the frame of the apparatus. This water-receptacle is divided by partitions 3 into chambers 4. The partitions are preferably, though not necessarily, double, as shown. The partition
40 forming the right-hand side of each chamber is preferably extended to form a spout 5 to direct the contents of the chamber into the vertical conduit 6, as hereinafter described.
45 Each chamber toward its right-hand side is preferably provided with a partial cover 7, extending to within a short distance of the partition, thus leaving an opening for the discharge of the water. The size of this opening
50 may be regulated by means of a slide 8, adjustably secured to the cover 7, as shown. Each chamber is provided in its side with an overflow-weir 9, so located that each weir when uppermost is over the upper end of the
55 overflow-conduit 10.

It will be noted that the sides of the water-

chamber are extended out past the ends of the projecting partitions 3, and these corners are stiffened and strengthened by the diagonal straps 11. These corners are adapted to
60 engage the buffer-beam 12 of the tipping detent 13. This detent is pivoted at 14 on the frame of the apparatus. At one side of the pivot the detent is provided with a water-pan 15, located below the lower end of the over-
65 flow-conduit 10. At the other side of the pivot a curved arm 16 extends substantially concentric with the periphery of the water-chamber. Below this arm a weight 17 is adjustably secured to a suitable brace, so that
70 it may be adjusted to cause the tipping detent to normally tend to maintain the position shown in Fig. 2.

The tipping detent operates as follows: It will be noticed that when the rotary water-
75 receptacle is in engagement with the buffer-beam 12 that the upper chamber 4 is overbalanced slightly to the right, so that as it is filled from an overhead-spout 18 the weight of
80 water in it tends to rotate the receptacle. As soon as the chamber fills to the level of the overflow-weir 9 the surplus water flows out and down through the conduit 10, filling the
85 pan 15. The added weight in the pan overbalances the detent and draws the buffer-beam 12 away from the receptacle, releasing the same and allowing it to rotate. The tipping of the chamber allows the water to flow
90 from the spout 5 into the vertical conduit 6. As it is necessary to allow the tipping detent to resume its normal position, some means must be provided to discharge the water from the pan 15. Various devices might be employed for this purpose.

It will be noted that the water-receptacle
95 is provided with a series of projections 22, preferably in the form of friction-rollers, which are adapted to engage the curved arm 16. To restore the tipping detent to its normal position with the buffer-beam in posi-
100 tion to engage the corners of the spouts 5, the rest 23 is preferably provided. It is engaged by the under side of the arm 16 when the detent is in its normal position.

The buffer-beam 12 is secured to pins 24,
105 which are adapted to slide in a frame 25, pivoted at 26 on the frame of the detent 13. Between the buffer-beam and the frame are located the cushion-springs 27, which ease the shock of the contact between the corners of
110 the spouts 5 and the buffer-beam. Rubber pads 28 are also provided to further ease the

blow. The pivots 26 are so located that the buffer-beam tends normally to assume the position shown in Fig. 1 with the heel of the frame 25 in contact with the stop-bar 29.

5 When the tipping detent is overbalanced by the overflow of water, the frame 25 tips, as shown in Fig. 9, and draws the buffer-beam easily from the corners of the spout 5.

10 Friction-rollers 30 are provided on the edge of the buffer-beam to reduce the friction as the corners draw past the buffer-beam.

To prevent back motion of the water-receptacle, I provide a swinging catch. This comprises a bar 31, journaled horizontally on 15 the frame of the machine adjacent to one of the faces of the water-receptacle. One end of this bar is turned upwardly and has a bevel-sided end 32 secured thereto in the path of a series of lugs 33, secured to the side 20 of the receptacle. A torsion-spring 34 engages the bar, and its support tends normally to retain the bevel-sided end in the position shown. Each lug 33 as it comes round engages the beveled side, tips the catch out- 25 wardly, and passes behind its end. The lugs are so located that one of them is immediately in front of the end 32 when the spout 5 is in engagement with the buffer-beam 12.

In Figs. 1, 2, and 4 is shown a chemical-so- 30 lution holder 35. The shaft 2 extends across this holder and is journaled thereon. On the shaft are secured beaters 36, which when the shaft is in rotation keep the chemical solution properly stirred. On the shaft is se- 35 cured a sprocket-wheel 37, carrying a sprocket-chain 38, passing round an idler-sprocket 39, journaled near the bottom of the holder. On the chain are pivoted a series of tipping cups 40 in the manner hereinafter described. 40 These cups are so shaped and pivoted, as will appear from Fig. 1, that they normally tend to tip to assume the position of the cup at the top of the tank in Fig. 1, but they are re- 45 tained in their normal position, however, by the engagement of their upper corners with a guide 41. This guide is preferably at its lower part the end of the chemical-solution holder. Above the holder it is formed, however, by the semicircular bar 42. In this bar at the 50 top of the holder at the rising side of the chain 38 is formed a gap 43. Each cup as it reaches this gap tips over, as shown in Fig. 1, and discharges its contents into the chemical-solution conduit 44, the lower end of which 55 communicates with the vertical conduit 6 through its side.

Adjacent to the gap 43 a tripping-arm 45 is secured to the chemical-solution holder in such a position as to engage the tail of each

cup after it has tipped, so that as the chain 60 carries along the cup the cup is tipped toward its normal position. To aid in restoring each cup to its normal position, the guide-bar 42 is inclined somewhat outwardly, so 65 that it will engage the corner of the cup and finish the operation of restoring it to its normal position. To lessen friction, the corner of each cup is provided with a friction-roller 46. The cups 40 are pivoted, preferably, in 70 the manner shown in Figs. 4, 5, and 6. The sides of one of the links of the chain 38 are extended upwardly and carry a disk 47 with a central hole therein. On the side of the cup is secured a disk 48, from which projects a pin 49, journaled in the hole in the disk 47 75 and held therein by a suitable pin or cotter. On the disk 47 is formed a pin 50. On the disk 48 I form the stops 51. These stops by engaging the pin 50 limit the tipping of the cup in either direction, insuring it always 80 being in position to operate properly.

From the above description it will be seen that I have devised a simple and efficient means whereby with an intermittent rotary motion the feed-water is intermingled with 85 properly-measured quantities of the solution.

What I claim as my invention is—

1. In a water-purifier the combination of a chemical-solution holder; an endless vertical carrier; cups pivoted thereon and normally 90 tending to tip; a guide with which the cups contact to keep them in normal position, a gap being formed in the guide at a suitable point to permit the cups to tip as they reach it; and a tripping-arm adjacent to the gap 95 adapted to engage the cups to return them to their normal position, substantially as described.

2. In a water-purifier the combination of a chemical-solution holder; an endless vertical 100 carrier; cups pivoted thereon and normally tending to tip; a guide with which the cups contact to keep them in normal position, a gap being formed in the guide at a suitable point to permit the cups to tip as they reach 105 it; a tripping-arm adjacent to the gap adapted to engage the cups to return them to their normal position, the guide above the gap being provided with an inclined portion adapted to aid in the returning of the cups to nor- 110 mal position, substantially as described.

Coraopolis, Pennsylvania, United States of America, September 2, 1905.

JOHN BOWEY, JR.

In presence of—

W. J. WIEGEL,
JAMES E. HAMMOND.