No. 757,375. PATENTED APR. 12, 1904.

F. B. WEST.

CARBONATOR.

APPLICATION FILED OCT. 11, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2

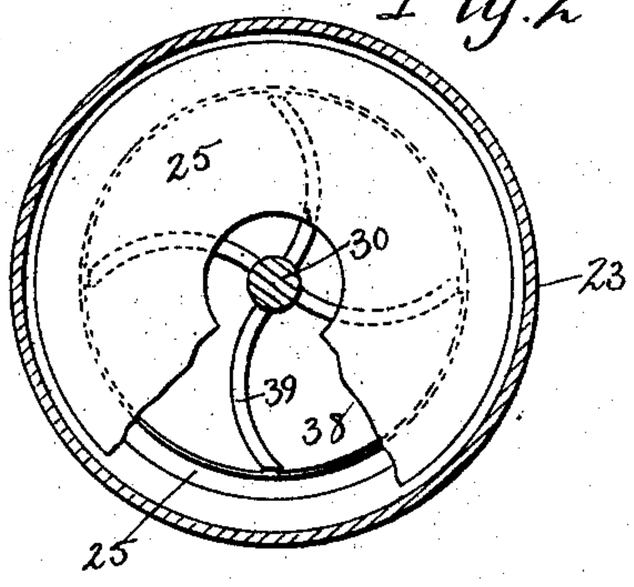
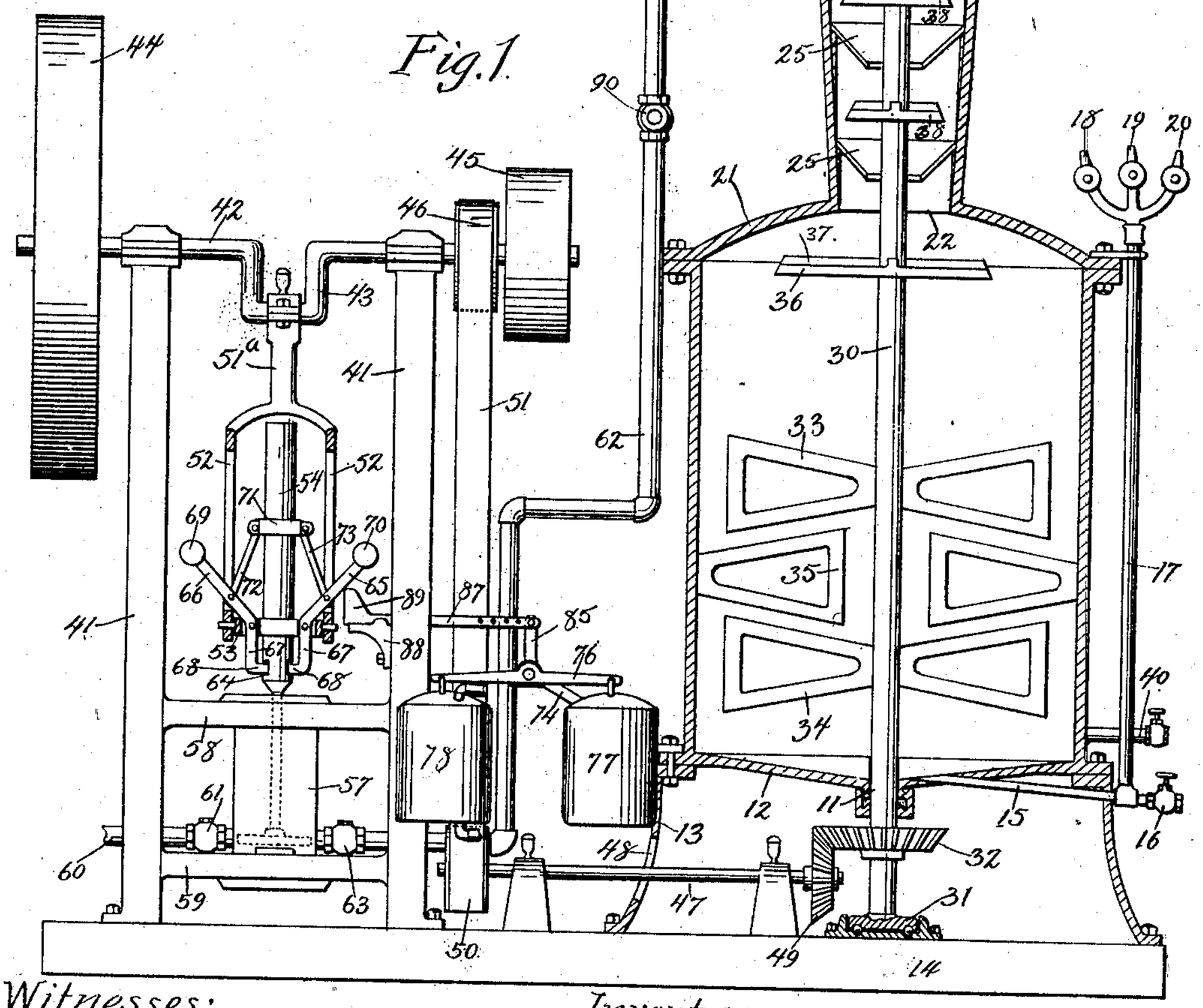


Fig. 1.



Witnesses:
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L. L. Leibrock

Inventor:
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NO MODEL. 2 SHEETS—SHEET 2.

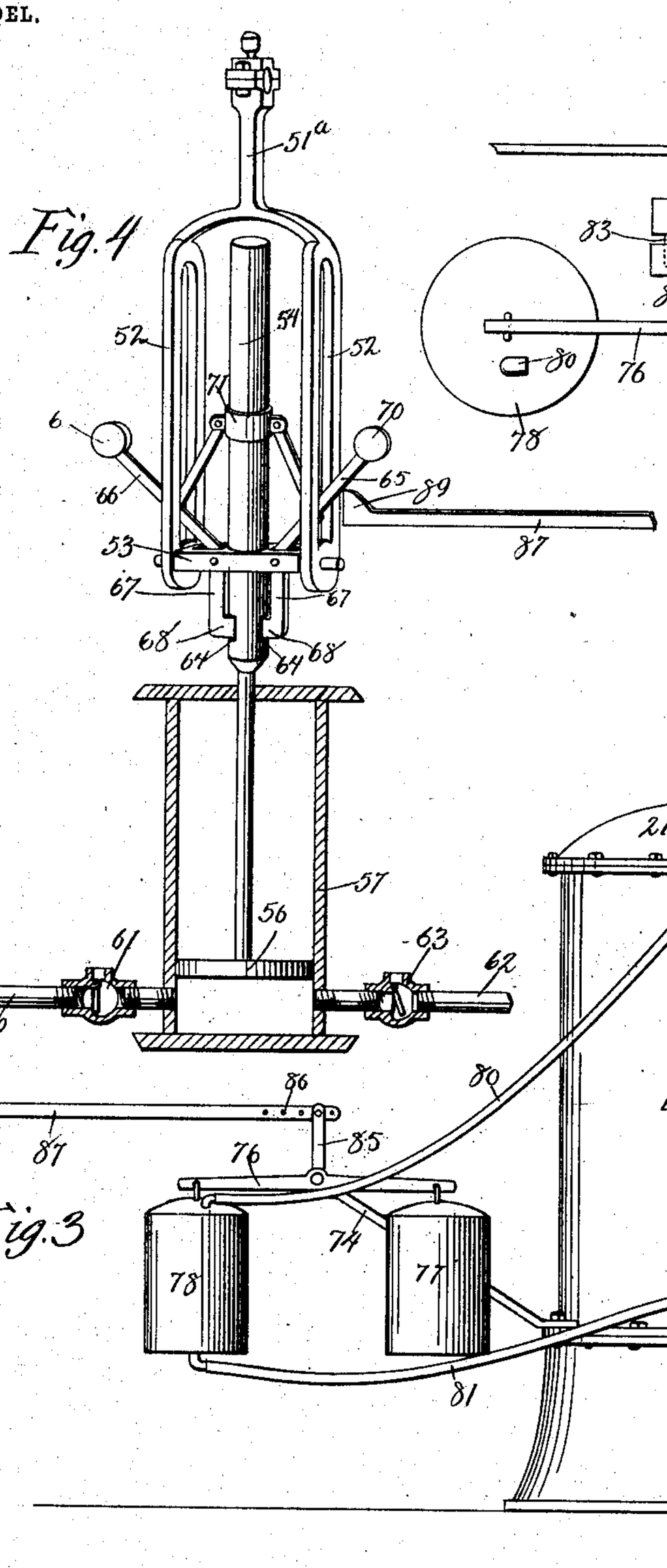

Fig. 4

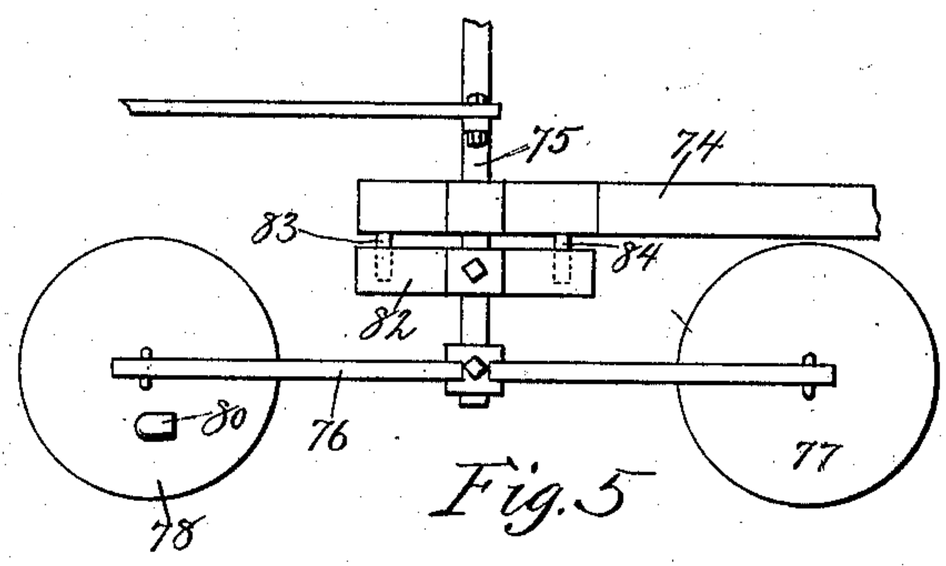

Fig. 5

Fig. 3

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No. 757,375. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

FRANK BATES WEST, OF COLFAX, IOWA.

CARBONATOR.

SPECIFICATION forming part of Letters Patent No. 757,375, dated April 12, 1904.

Application filed October 11, 1902. Serial No. 126,949. (No model.)

To all whom it may concern:

Be it known that I, FRANK BATES WEST, a citizen of the United States, residing at Colfax, in the county of Jasper and State of Iowa, have invented a certain new and useful Carbonator, of which the following is a specification.

The objects of my invention are to provide a carbonator for mixing the mineral water with the gas by a simple and inexpensive device. I accomplish this object by means of a series of disks rotatably mounted beneath the openings of a series of funnels, so that as the water passes through these funnels on to the rotating disks it will become thoroughly mixed with the gas which is in the retaining-tank, in which my disks rotate.

A further object is to provide a pump for drawing water from a supply-pipe and forcing it into the upper portion of the gas-retaining tank.

A further object is to provide means for automatically throwing the means for driving the piston of the pumping device out of gear with said piston, the driving means of said pumping device being also used to rotate the disks in the gas-retaining tank.

A further object is to provide rotating disks in the gas-retaining tank which have upwardly-extending projections so arranged that the water will be thrown from the disks as they rotate and allowed to drop down from said disks.

A further object is to provide a water-indicating device by which the height of the water in the gas-receiving tank is determined and to which tubes are attached to regulate the height of the water in the can which forms a portion of the means for automatically throwing the driving mechanism out of gear with the piston, so that as the water in the retaining-tank rises the water in the said can will rise correspondingly.

A further object is to provide a pipe for allowing the carbonated water to be drawn from the tank and run into bottles or other receptacles. I have also provided means for allowing the waste water which is often left in the tank to escape from beneath the bottom of the tank.

A further object is to provide a safety-valve in the gas-retaining tank which can be operated by hand.

A further object is to provide a gas-inlet into said retaining-tank.

Further, it is my object to provide means for limiting the upward and downward movement of the can which forms a portion of the means for automatically throwing the driving mechanism out of gear with the pump.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the pumping device, showing the piston in said device in dotted lines and showing a vertical sectional view of the gas-receiving tank. This view also shows the means for throwing the driving mechanism of the pumping device in and out of gear with the piston forming a portion of said device and also the pipe leading from the pump into the gas-retaining tank. Fig. 2 is a cross-sectional view of the retaining-tank cut through the line 2 2 of Fig. 1. This shows a portion of one of the funnels in the retaining-tank broken away to illustrate more clearly the rotating disks. Fig. 3 shows in perspective the lower portion of the gas-retaining tank and a portion of the means whereby the driving mechanism of the pump is thrown in and out of gear with the piston of said mechanism. The top portion of the gas-retaining tank in this view is broken away. Fig. 4 shows the piston, piston-rod, and the lower portion of the driving mechanism of the pumping device. This is intended to illustrate the way in which the piston is kept in gear with the driving mechanism of the pump and also to show a portion of the means for throwing said mechanism out of gear with said piston. Fig. 5 is a plan view of the weight and can of the mechanism for throwing the piston in and out of gear with the driving mechanism and also showing the means for limiting the upward and downward movements of the can and weight.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the lower portion of the gas-retaining tank. This portion of the gas-retaining tank is substantially circular in cross-section and has a bottom portion with an opening 11 extending through it. This bottom portion is bent downwardly a slight distance from the lower end of the sides of said tank. Beneath the bottom, which I have referred to by the numeral 12, I have provided a circular support 13, so that there will be plenty of room beneath the bottom 12 and between it and the platform 14, upon which the tank is placed, to allow bevel gear-wheels to be operated, as hereinafter more fully described.

I have provided an outlet-pipe 15, which enters the bottom 12 and passes through it near its central portion. This outlet-pipe 15 has a valve 16 to control the flow through said pipe. Extending substantially at right angles to the pipe 15 and outside of the support 13 is the delivery-pipe 17, said delivery-pipe being attached at its upper end near the top of the lower portion of the tank. This pipe 17 has three valve-controlled outlets 18, 19, and 20, so that a number of bottles or other receptacles may be filled at the same time when the water passes out through it. The top portion of the gas-retaining tank 10 is formed by a circular oval part 21, having a circular opening 22 in its central portion, with a funnel extending upwardly from the opening 22, and the distance between the sides of this funnel, which I have designated by the numeral 23, becomes greater as the top of said funnel is approached—that is, the distance between the sides of the funnel 23 at the top is greater than the distance between the sides of the funnel at the bottom. On the sides of this funnel 23 I have provided the projections 24, which extend around the entire interior of the funnel 23. Any number of these projections 24 may be used in the funnel 23. These projections 24 are designed to support the funnels 25, which are detachably mounted within the funnel 23, as will be apparent, said funnels 25 having openings in their lower central portion, so that the mouths of the funnels 25 are nearest to the top of the funnel 23. These funnels are arranged at equal distances apart throughout the vertical length of the funnel 23. The top 26 of this funnel 23 is provided with a safety-valve 27, said safety-valve also being provided with a mechanism for operating it manually by means of the rod 28.

Extending through the openings 29 at the lower portion of the funnels 25 is a disk-driving shaft 30, said disk-driving shaft also extending through the opening 11 in the bottom of the retaining-tank 10. The lower end of the shaft 30 is provided with a roller-bearing 31, said roller-bearing being mounted on the bottom 14. This roller-bearing is so arranged that the disk-driving shaft can rotate on this bearing when the shaft is standing in a vertical position. This roller-bearing 31 is on the interior of the standard 13. Mounted on this shaft 30 and between the bottom 12 and the roller-bearing 31 is a bevel gear-wheel 32, which is designed to be driven directly from the engine, as hereinafter disclosed. Mounted on the shaft 30 and substantially at right angles to it are the fans 33 and 34. Extending between these fans and attached to the sides of the interior of the gas-retaining tank are the fans 35. Any desirable number of these fans may be used on the interior of the tank 10. Mounted on the shaft 30 and near the top portion 21 is a disk 36, having the projections 37 extending upwardly therefrom and substantially at right angles to the body portion of said disk. Mounted on the shaft 30 and on the portions of it which are between the funnels 25 is a series of disks 38, having the projections 39 extending upwardly therefrom and substantially at right angles to the body portion thereof. These projections are curved from their point of attachment at the central portion of the disk to the outer portion thereof. This curve is made so that the outer portion of the projections 39 is farther behind than the central portion thereof when the disk is rotated in the desired direction. The outside portions of these disks are beveled from their upper portion downwardly, so that as the water passes into the funnel 25 it will pass through the opening 29 in said funnel and on to the disk 38 and flow freely from said disk into the funnel next below. The disk 38 near the top of the funnel 23 is as much larger than the disk near the lower end of said funnel 23 as the funnel is larger at its top portion than the funnel is at its bottom portion.

I have provided a valve-controlled gas-inlet 40, which extends into the center of the tank 10 near its lower extremity. Mounted on the standard 14, which supports the retaining-tank 10, are the uprights 41, having the shaft 42 rotatably mounted at their upper portion.

The shaft 42 has a U-shaped portion 43 midway between its extremities and between the uprights 41. This shaft 42 is substantially in the same line as a line would be drawn from the central portion of one side of the tank 10 to the opposite side thereof. In this connection I consider the front of my tank 10 to be that portion which is shown in Fig. 3 of the drawings. Mounted on the end of the shaft 42 outside of one of the uprights 41 and away from the retaining-tank 10 is the fly-wheel 44. Mounted on the opposite end of the shaft 42 and on that end which is nearest the tank 10 I have provided a drive-wheel 45. Inside of the drive-wheel 45 is a smaller wheel 46.

Rotatably mounted on the platform 14 is the driving-shaft 47, said shaft 47 extending through the opening 48 at one side of the tank-support 13. The shaft 47 has a bevel gear-wheel 49 on one end thereof in mesh with

the gear-wheel 32. This shaft 47 also has a drive-wheel 50 near the opposite end of the shaft from the wheel 47, said wheel 50 being outside of the support 13. The wheels 46 and 50 are designed to have a belt 51 passed over them, so that as the wheel 46 is rotated the wheel 50 will be rotated in a corresponding direction, thus rotating the shaft 47 and the gear-wheel 49 in the same direction as the drive-wheel 50. It will be seen that when this shaft 47 is rotated the disk-bearing shaft 30 will be rotated at the same time, as the gear-wheels 32 and 49 are in mesh with each other.

Rotatably mounted on the U-shaped portion 43 of the shaft 42 and extending downwardly therefrom is a driving-arm having a body portion 51^a attached to the shaft 42. At the lower end of this body portion 51^a and some distance from each other are the arms 52, said arms forming a U, the U, however, being inverted, so that the lower ends of said arms 52 can be firmly attached to the ring 53, which is slidingly mounted on a rod 54, which is mounted between said arms 52. The rod 54 has a body portion circular in cross-section, and it also has a disk 56 at its outer end, designed to fit into the cylinder 57. This cylinder 57 is mounted between the uprights 58 and 59, which are mounted between the uprights 41 and below their central portion. Leading into the lower portion of the cylinder 57 and on the side of said cylinder which is away from the tank 10 is the supply-pipe 60, having a one-way valve 61 therein so arranged that as the piston moves upwardly the water will flow freely into the cylinder 57 on account of the one-way valve being open and the valve opening toward the cylinder, and when the piston lowers in the cylinder the valve in the supply-pipe will be closed. I have provided an outlet supply-pipe 62 from my cylinder 57, leading into the funnel-shaped portion 23 of the retaining-tank 10, said supply-pipe entering the funnel-shaped portion near its top. I have provided a one-way valve 63 in the pipe 62 and near that portion of it which enters the cylinder 57. This valve is so arranged that it will swing inwardly toward the cylinder as the piston 57 rises; but as the piston 57 lowers the valve 63 will be thrown away from the cylinder 57, and thus allow the water which has been drawn into the cylinder to be forced through the pipe 62 and into the retaining-tank 10. From this it will be seen that as the piston 54 rises the one-way valve 63 will be closed and the one-way valve 61 will be open and as the piston 54 lowers the one-way valve 63 will be open and the one-way valve 61 will be closed, thus causing the water to be pumped into the retaining-tank 10 as the piston is moved upwardly and downwardly.

Encircling the piston-rod 54 at that portion of it which is immediately above the cylinder 57 when the rod 54 is at its lower limit of movement are the grooves 64. Pivotally attached to the ring 53, which is capable of vertically sliding on the rod 54, are the levers 65 and 66, the lower portions of said levers extending from their points of attachment to the ring 53 straight downwardly and substantially parallel to the sides of the rod 54 and have the inwardly-projecting extensions 68 thereon, said inwardly-projecting extensions 68 being substantially at right angles to the lower portions 67 and being designed to enter the grooves when the mechanism of my pump is in position for coöperation.

The upper portions of the levers 65 and 66 extend away from their pivotal points and have the weights 69 and 70 at their upper outer ends. These weights are so arranged that the projection 68 on the lower ends of the levers 65 and 66 enter the grooves 64 in the rod when the arms 52 are at their lower limit of movement. These weights also constantly keep the lower ends of the levers 65 and 66 in engagement with the rod 54 except when they are forced out of engagement with said rod, as hereinafter disclosed.

Slidingly mounted on the rod 54 is the ring 71, said ring being above the ring 53. The ring 71 and the levers 65 and 66 are connected with each other by means of the pivotally-mounted rods 72 and 73, said ring being forced upwardly and downwardly as the weights 69 and 70 are raised or lowered. Firmly attached to that side of the tank 10 which is nearest the pump and extending upwardly and away from its point of attachment is the supporting-arm 74. Rotatably mounted at the upper end of this arm 74 and substantially at right angles thereto is a shaft 75. Mounted on said shaft, near one end thereof and substantially at right angles thereto, is the equalizer-shaft 76. At one end of said equalizer-shaft I have provided a weight 77, and at the other end I have provided a can 78. Attached to the front of the tank 10 is the water-glass 79, having an outlet at its upper extremity and also at its lower extremity. The can 78 also has an outlet at its upper portion and an outlet at the bottom portion. The outlet at the upper portion of the can 78 is connected with the upper portion of the water-glass 79 by means of the tube 80. The outlet at the bottom portion of the can 78 is connected with the bottom portion of the water-glass 79 by means of the tube 81. The water-glass also has inlets into the interior of the tank 10, so that connection is provided between the interior of the tank 10 and the water-glass 79, so that as the water rises in the tank 10 it will correspondingly rise in the can 78. The can 78 and the weight 77 are so adjusted that when the can 78 has no water in it the weight 77 will draw the end of the equalizing-shaft 76 to which it is attached downwardly and cause the end to which the can 78 is attached to be drawn upwardly; but when the can 78

is filled with water the end of the equalizing-shaft 76 to which the can 78 is attached will be drawn downwardly and cause the opposite end of said shaft to be raised. The equalizing-shaft 76 is firmly attached to the shaft 75. I have provided a metal plate 82, which is also firmly attached to the shaft 75 and between the arm 74 and the equalizing-shaft 76. Projecting from the arm 74 and a slight distance beneath the plate 82 are the pins 83 and 84. The pin 83 is designed to limit the downward movement of the can 78 and the upward movement of the weight 77. The pin 84 is designed to limit the downward movement of the weight 77 and the upward movement of the can 78.

Firmly attached to the shaft 75 and extending upwardly from and at right angles to it is the lever 85, having a bolt at its upper end designed to pass through any one of the openings 86 in the lever 87, to which it is designed to be attached. This series of openings is so arranged that the equalizer can be adjusted to suit the pleasure of the operator. Extending at right angles to the lever 85 substantially parallel with the equalizing-shaft 76, so that its end away from the point of attachment to the lever 85 is supported by means of a bracket 88, said bracket being firmly attached to the interior of one of the uprights 41 of the pump, is the lever 87, above mentioned. Said lever 87 has an upwardly-projecting member 89, which is designed to engage the upper portion of the lever 65 when the driving-arm 51^a is at its lower limit of movement and when the weight 77 is also at its lower limit of movement and is designed to throw the projection 68 out of the groove 64 in the piston-rod when the can 78 is filled with water, causing the weight 77 to be drawn upwardly and forcing the lever 87 toward said lever. It will be seen that as the upper portion of the levers 65 and 66 are forced upwardly by means of the lever 87 and its attachments the piston 54 will remain stationary and the arms 52, which are provided with a longitudinal slot through which the levers 65 and 66 pass, will move upwardly and downwardly and cause the rings 53 and 71 to slide upwardly and downwardly on the piston without raising it. Thus the piston-rod will be thrown out of gear with the driving mechanism of the pump when the water in the tank 10 is at a predetermined height, causing the water in the can 78 to draw said can downwardly and force the weight 77 upwardly, thus throwing the levers 65 and 66 out of engagement with the grooves 64.

I have also provided the regulating-valves 90 and 91 in the connecting-pipe 62.

In practical use the operator adjusts the weight 77 and the water-can 78 as desired, fills the tank 10 with gas, and starts the pump into full operation by connecting it with the driving means. The weight 77 in this instance is at its lower limit of movement, thus causing the lever 87 to be as far away from the lever 65 as it is possible to be. The water will be forced by means of the pump through the supply-pipe 62 into the upper portion of the funnel 23, in which the disk-bearing shaft 30 is rotating. The water will pass through the gas in the tank, first entering the funnel 23 at the upper portion thereof, then running into the uppermost of the series of funnels 25 through the opening 29 in said funnel and onto the uppermost of the rotating disks 38. It is then thrown off of the rotating disk and onto the next funnel of the series of funnels 25, and so on until it reaches the rotating disk 36, whence it drops downwardly onto the rotating fans, which complete the thorough mixing of the water with the gas in the tank. As soon as the water in the tank 10 reaches a certain predetermined height the piston of the pump is automatically thrown out of gear with the driving mechanism by the means above described. The water is now ready to be drawn from the tank 10 through the pipe 17, as above indicated.

If it is desired to clean the tank 10, the operator can do so by removing the top portion of the tank from the bottom portion thereof by simply removing the gear-wheel 32 and the roller-bearing 31.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a carbonator, the combination with a water-tank, of a tapering funnel portion supported on the tank and having communication therewith at its bottom, the lower end of the funnel portion being of less diameter than the diameter of the tank, an upright shaft journaled in the tank and extending through the funnel portion, a plurality of funnels supported in the funnel portion and spaced apart, a plurality of disks carried by the shaft and located below the funnels, fans attached to the shaft and arranged in the tank below the lower end of the funnel portion, means for supplying liquid to the upper end of the funnel portion, and means for rotating the shaft.

2. In a carbonator, the combination with a water-tank having a funnel portion tapering toward its lower end, of funnels located in the tank and spaced from each other, said funnels having central discharge-openings, an upright shaft extending longitudinally through the funnel portion and through the openings in the funnels, disks carried by the shaft and located below the discharge-openings, and radially-disposed curved flanges arranged on the upper faces of the disks.

3. In a carbonator, the combination with a cylindrical liquid-receiving tank, of a downwardly-tapering funnel portion projecting above the tank and of less diameter than the same, the lower end of the funnel portion being in communication with the top of the tank,

a vertical shaft extending through the tank and funnel portion, a plurality of funnels supported within the funnel portion of the tank and having centrally-disposed discharge-openings, a plurality of horizontally-arranged disks carried by the shaft and located beneath the funnels, said disks having radially-disposed flanges on their upper faces, radially-disposed fans carried by the shaft and located in the tank below the funnel portion, said fans being spaced apart, stationary fans attached to the walls of the tank and arranged between the fans of the shaft, means for rotating the vertical shaft, and means for supplying liquid to the top of the funnel portion above the funnels therein.

4. In a carbonator, the combination with a liquid-receiving tank, of agitating means located therein, a pump for supplying liquid to the tank, common driving means for actuating the agitating means and pump, and means for automatically disconnecting the pump and driving means without stopping said driving means.

5. In a carbonator, the combination with a liquid-receiving tank, of agitating means located therein, a pump for supplying liquid to the tank, said pump including a reciprocatory plunger, common driving means for actuating the agitating means and reciprocating the pump-plunger, and means actuated by the liquid in the tank for disconnecting the plunger and driving means.

6. In a carbonator, the combination with a liquid-receiving tank, of agitating means located therein, a pump for supplying liquid to the tank, said pump including a reciprocatory plunger, a driving-shaft having a crank, mechanism connecting the agitating means and driving-shaft for moving the latter, a clutch connection between the piston and crank of the shaft, and means actuated by the liquid within the tank for operating the clutch, said means being movable into the path of movement of said clutch.

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