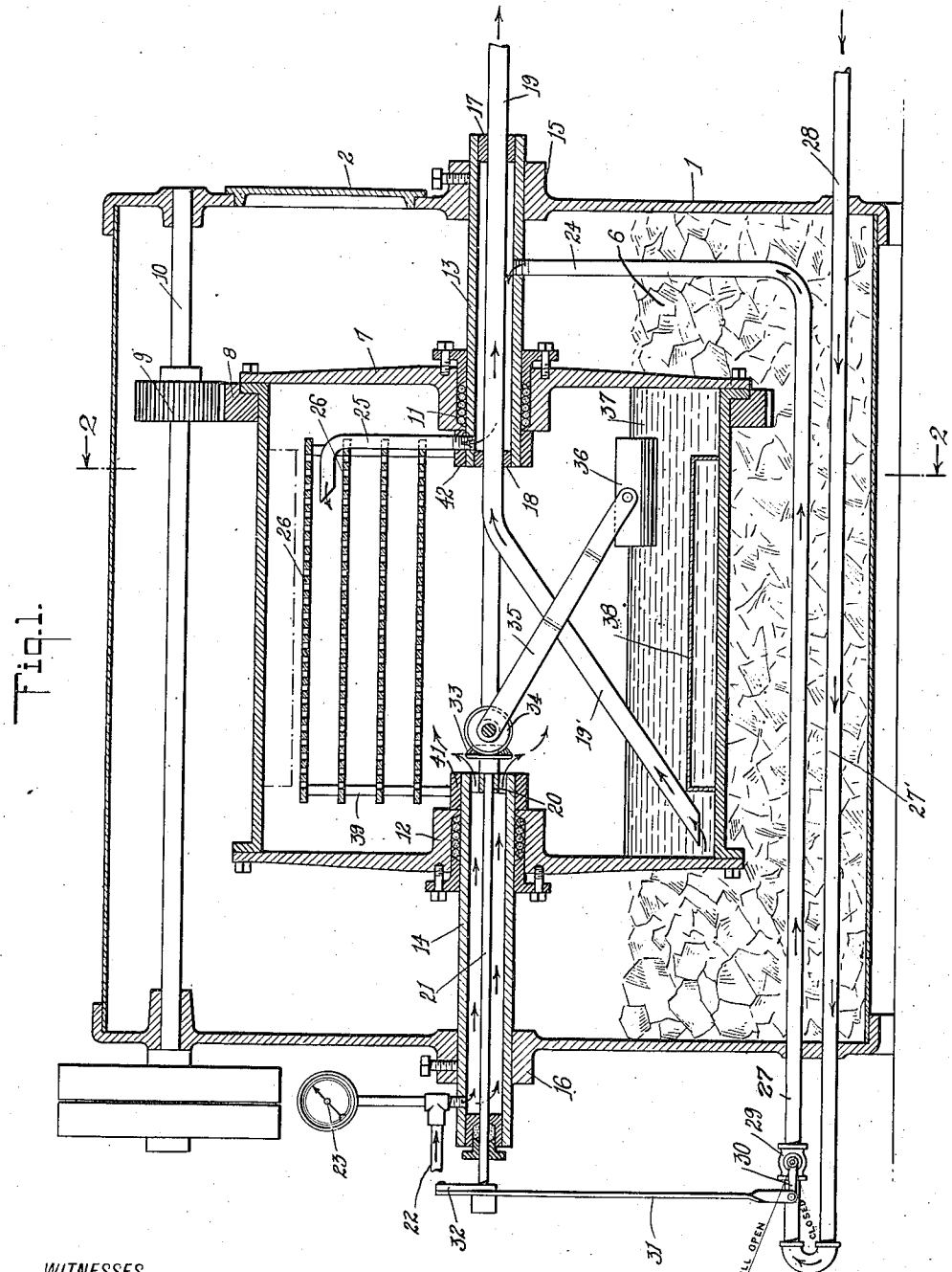
Mar. 6, 1923. 1,447,884

J. PHILIPPI

CARBONATING MACHINE

Filed July 1, 1920 2 sheets-sheet 1

Fig.1.



WITNESSES

Frederick Diehl.

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Fig.2.

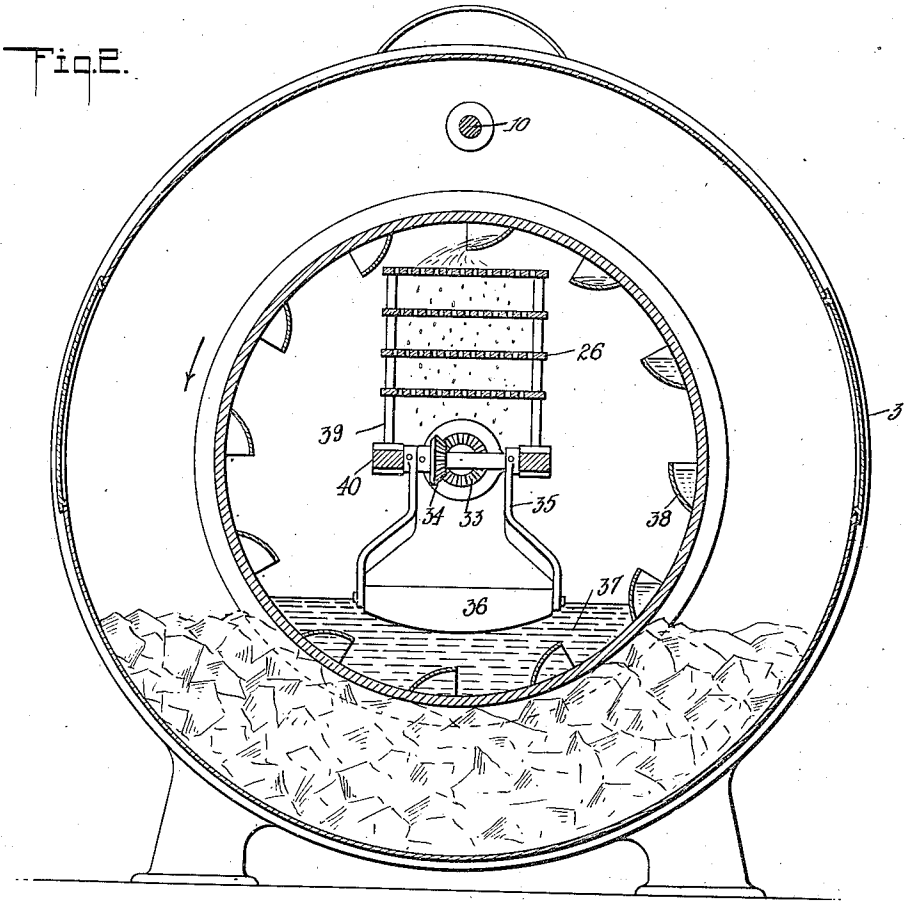
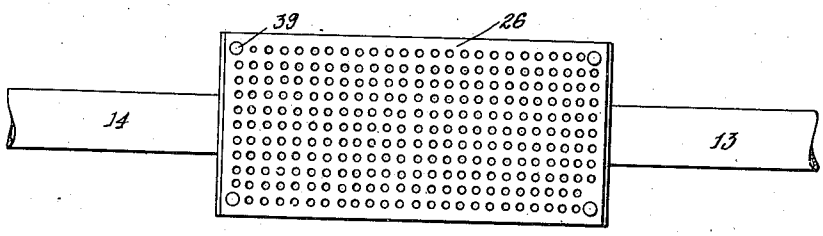


Fig.3.



WITNESSES

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Patented Mar. 6, 1923.

1,447,884

UNITED STATES PATENT OFFICE.

JACOB PHILIPPI, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO JULIUS MINCK, OF WEST HOBOKEN, NEW JERSEY.

CARBONATING MACHINE.

Application filed July 1, 1920. Serial No. 393,369.

To all whom it may concern:

Be it known that I, JACOB PHILIPPI, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county of New York and State of New York, have invented a new and Improved Carbonating Machine, of which the following is a full, clear, and exact description.

This invention relates to carbonating machines and has for an object to provide an improved construction wherein water and gas are mixed while the water is in a finely divided state.

Another object of the invention is to provide a machine in which water is automatically fed into the machine as fast as the carbonated water is removed and the feeding in and removal of the water is carried on without interrupting the carbonating operation.

A further object of the invention is to provide a carbonating machine which will provide cold water in a finely divided or comminuted condition while subject to gas under pressure.

In the accompanying drawings—

Figure 1 is a longitudinal vertical section through a machine disclosing an embodiment of the invention.

Fig. 2 is a transverse section through Fig. 1 on line 2—2.

Fig. 3 is a top plan view of sieve structure used in breaking up the water into a finely divided condition.

Referring to the accompanying drawings by numerals, 1 indicates a casing which is supported in any desired manner and for convenience is preferably round in cross section as shown in Fig. 2, this casing may be provided with end doors 2 and side doors 3 and 4 in order to supply ice or other cooling medium 6.

Arranged interiorly of the casing 1 is a drum 7 which drum is made from cast iron or some other strong material so as to withstand the pressure of the carbon dioxide while the machine is operating, and the drum 7 is provided with an annular rack 8 continually meshing with pinion 9, rigidly secured to shaft 10, which shaft is journaled in suitable journal boxes in the casing 1. An idle and active pulley may be arranged on shaft 10 exteriorly of the casing 1 so that power may be transmitted to shaft 10 and all parts connected therewith. It is intended that the drum 7 shall rotate continually during the operation of the machine and that carbonated water may be removed either continually or intermittently as desired without affecting or molesting in any manner the rotation of the drum. The drum 7 is provided with hubs 11 and 12 which are formed as packing boxes and through which the hollow shafts 13 and 14 extend, said shafts supporting the drum properly in the casing 1, but spaced therefrom, the hollow shafts 13 and 24 extending through suitable bearing boxes 15 and 16 in the ends of the casing 1. The hollow shaft 13 is provided with combined packing and journal members 17 and 18 which accommodate the discharge pipe 19. As the pipe 19 is stationary and shaft 13 is stationary these packing members may be pressed tightly in position so as to seal the ends of the shaft without changing the function of the pipe 19 which is merely to lead the carbonated water from the lower part of the drum 7 to a suitable discharge point. In order that the carbonated water may freely flow from pipe 19 a depending section 19′ is provided at the inner end of the pipe as shown in Fig. 1, said depending section projecting to near one end and at the lowermost point of the drum. The shaft 14 is provided with a perforated bearing 20 which may be in the form of an ordinary spider bearing for supporting the inner end of shaft 21. The outer end of shaft 14 is provided with a suitable packing box in order to seal the outer end of the shaft 14, while permitting the shaft 21 to rock. The sealing of the shaft 14 is necessary in order that the gas coming through pipe 22 may freely enter the shaft 14 and discharge through member 20 into drum 7 without any appreciable loss.

If desired a pressure gage 23 could be inserted near the entrance pipe 22 into shaft 14 so that the pressure in the drum may be seen at any time. The shaft 13 is provided with packing 17 and 18 in order to seal the ends of shaft 13 so that water entering said shaft from pipe 24 will not escape from the ends of the pipe, but will pass upwardly through the inlet discharge member 25 and be discharged over one of the foraminous plates 26 whereby the same is broken up and finely divided.

Pipe 24 extends downwardly to near the

bottom of casing 1 and merges into a horizontal section which extends through the end of the casing and is bent back upon itself so as to provide a lower or return section 27' which section merges into inlet pipe 28, which inlet pipe receives water from any suitable source. A valve 29 is arranged in the pipe 27 exteriorly of the casing 1, said valve having an actuating arm 30 which is pivotally connected with a link 31, said link in turn being pivotally connected to the outer end of an arm 32 rigidly secured to the shaft 21. Whenever shaft 21 is rocked in one direction valve 29 will be closed and when rocked in the opposite direction said valve will be opened. In order to cause a rocking action of the shaft 21 a bevel pinion 33 is rigidly secured thereto and continually meshes with a bevel pinion 34 carried by an arm 35. A float 36 of any desired kind is pivotally connected with the lower end of arm 35 and rises and falls with the water 37. In case the pipe 19 has been shut off so that no more carbonated water will flow therefrom, uncarbonated water will continue to flow from pipe 28 and be eventually discharged in drum 7 through member 25. This will cause the level of water 37 to move upwardly and consequently cause the float 36 to swing arm 35 upwardly and thereby rotate shaft 21 as the bevel gears 33 and 34 will be moved. The rotation or rocking of shaft 21 will continue until the valve 29 has been closed, whereupon the water will be shut off though the drum 7 will continue to rotate.

During the operation of the machine the carbon dioxide is introduced continually so as to maintain the desired pressure, and drum 7 is rotated continually whether the water is being introduced or not. As the drum is rotated the water and carbon dioxide are mixed. In the formation of natural carbonated water the water is cold and finely divided by sand and gravel in the earth. While in this finely divided cold condition the carbon dioxide passes therethrough and mixes therewith so that it is thoroughly commingled before it emerges from the earth, and consequently the gas will remain in the water an appreciable time after exposed to the atmosphere. This is caused by the fact that the gas is very finely divided and forms very small bubbles in the water whereby said bubbles cannot readily move to the top.

In carbonating water artificially quite often the gas is mixed so that the bubbles will be of appreciable size and will consequently have enough buoyancy to quickly move to the surface and become dissipated. In the present invention by providing cold water and finely dividing or spraying the same in the gas while under pressure causes an intimate mixture of the water and gas so that the carbonated water flowing out of pipe 19 will approach in condition natural carbonated water. To finely divide the water in the presence of carbon dioxide, drum 7 is provided with a number of buckets 38. These buckets elevate the water and discharge part of the elevated water on to the foraminous series of plates 26. The discharge of the water from the buckets on to this set of plates will divide the water somewhat, and as the water falls from one plate to the other it is further divided, and this division of the water takes place in the presence of the gas whereby a thorough commingling will result. Some of the water will of course be spilled from the buckets before it reaches the top plate 26, but this slipping and splashing of the water causes a finely dividing action and assists in mixing the water and gas. The plates 26 may be of any width and also any number, four being shown. These plates are connected in any suitable manner to a number of uprights 39 which are secured to a frame 40, said frame having what may be termed as hub sections 41 and 42 which are fitted over and rigidly secured to the shafts 13 and 14. It will be noted that the pipe 25 is notched into some of the plates 26 and acts as means for preventing any rotary motion of the frame 40. As the water is forced from shaft 13 into pipe 25 it is discharged from the pipe 25 on to one of the plates 26 and is finely divided thereby. The water already in the drum is elevated by the various buckets 38 and finely divided by being spilled therefrom and by being dumped on to the plates 26. The speed of the rotation of the drum 7 and the buckets passing more or less rapidly from the body of water 37 will cause an additional splashing and mixing. All of this splashing and mixing of the gas and water is being done at a low temperature and consequently the gas commingles with the water in a finely divided state. In addition it may be noted that the water is drawn off from near the bottom of the drum so that only the thoroughly mixed water and gas is drawn off.

I claim:

1. A carbonating machine comprising a drum, a pair of hollow fixed shafts supporting said drum, buckets carried by the drum on its annular wall, a plurality of nested foraminous superimposed plates supported on said shafts, said buckets raising and discharging the water within said drum to a point above said foraminous plates, means connected to one of said shafts for directing additional water into the drum, said means extending above said foraminous plates, means extending through said last mentioned shaft for drawing off the water from the lowermost part of the drum, and means connected to the other shaft for maintaining a supply of carbon dioxide under pressure

in said drum for readily allowing said carbon dioxide to mix in fine bubbles with the water emerging out of said foraminous plates.

2. A carbonating machine, comprising an outer casing containing a chilling element, a drum therein, said drum being rotatably mounted on a pair of hollow stationary shafts supported by said casing, a plurality of foraminous plates also supported on said shafts and arranged within said drum, buckets secured to the inner walls of the drum for elevating the fluid therein from the bottom and discharge the same above said plates, thereby comminuting the liquid, a discharge pipe connected to the inner end of one of said shafts and extended above said plates for discharging uncarbonated fluid on said plates, and a second pipe projected through said last-mentioned shaft extended to the bottom of said drum for drawing the carbonated fluid therefrom.

JACOB PHILIPPI.