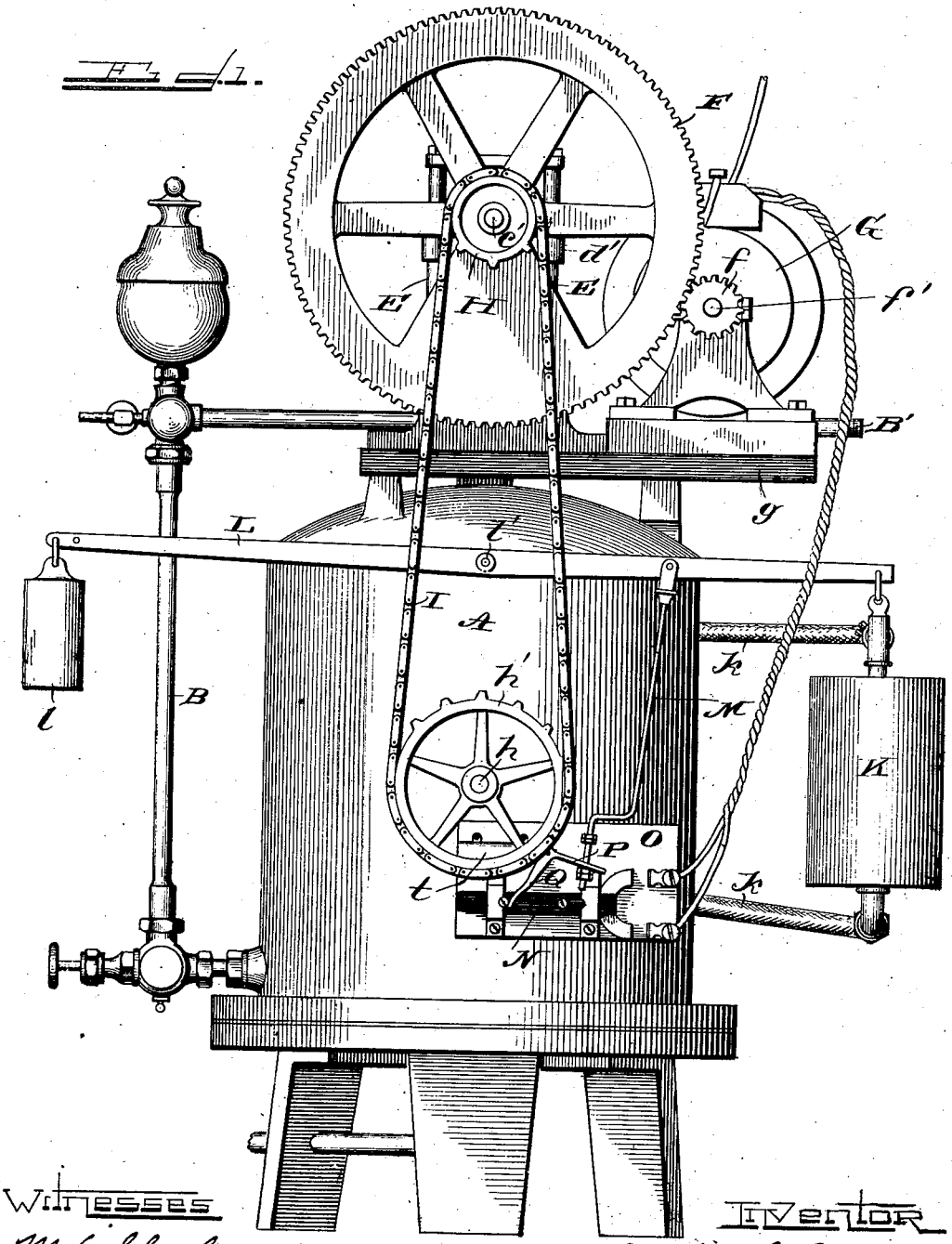
No. 676,406. Patented June 18, 1901.

C. L. BASTIAN.

CARBONATOR.

(Application filed Apr. 9, 1900.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses

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(No Model.) 3 Sheets—Sheet 2.

FIG. 1.

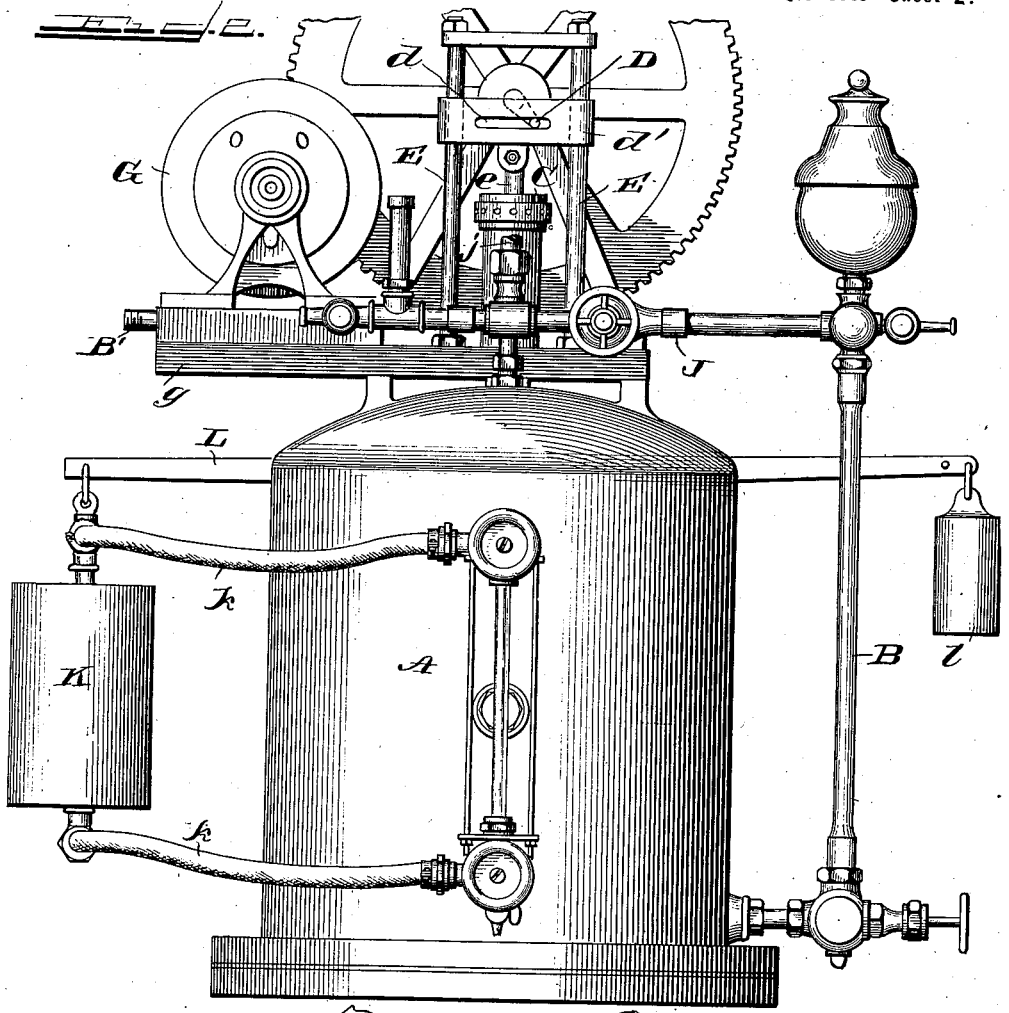
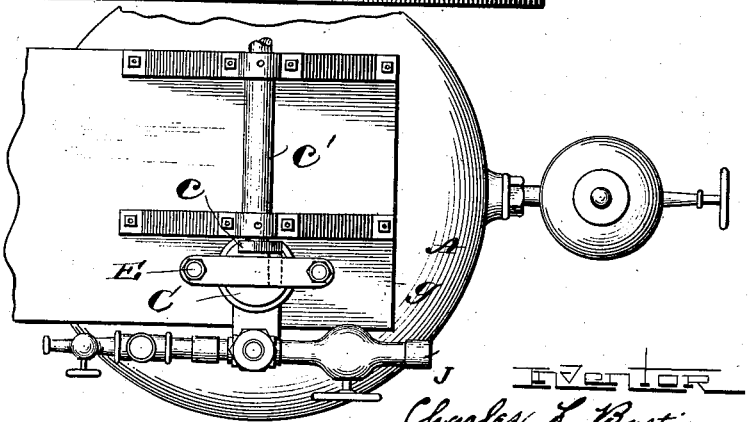


FIG. 2.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 4.

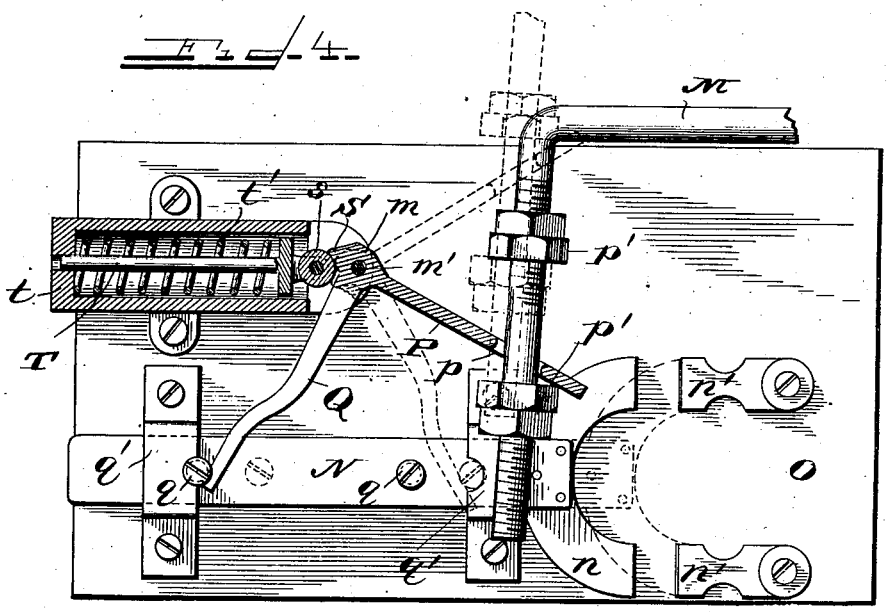


Fig. 5.

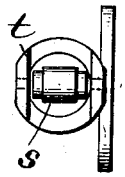


Fig. 6.

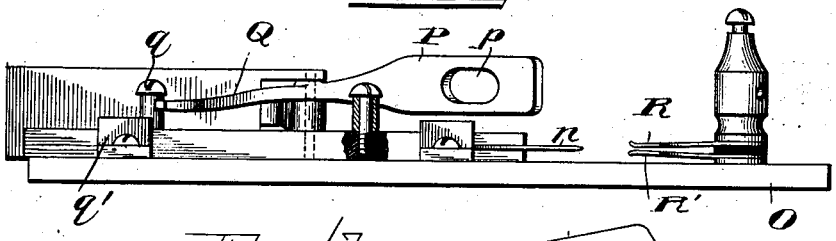
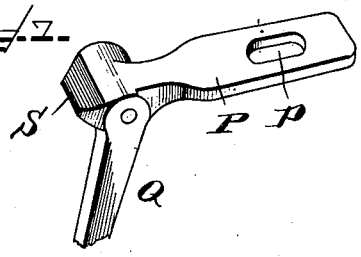


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES L. BASTIAN, OF CHICAGO, ILLINOIS.

CARBONATOR.

SPECIFICATION forming part of Letters Patent No. 676,406, dated June 18, 1901.

Application filed April 9, 1900. Serial No. 12,145. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. BASTIAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbonators, of which the following is a specification.

My invention relates to certain new and useful improvements in carbonating apparatus; and its object is, primarily, to provide for thoroughly mixing carbonic-acid gas under pressure with water or other liquid to produce a carbonated beverage completely saturated with the gas and operating automatically, so as to shut off the supply of water when it rises above a predetermined level.

Another important object of the invention is to provide for turning the water-supply on or off quickly, so that the admission of water to the tank will be governed by the slightest variation of the level of the water in the tank above or below a predetermined level, and another object of the invention is to provide for operating my improved carbonating apparatus electrically and mounting the motor on the tank to provide a compact and convenient location and arrangement of parts.

In the accompanying drawings, Figure 1 is an elevation showing one side of my improved apparatus. Fig. 2 is a similar view showing the opposite side of the apparatus. Fig. 3 is a top plan view. Fig. 4 is an enlarged view showing the switch devices and partly in section. Fig. 5 is a detail view. Fig. 6 is an elevation of the switch devices, partly in section. Fig. 7 is a detail view of the switch-tripper.

Referring to the drawings, in which like letters of reference denote corresponding parts in all figures, A designates the mixer, which comprises a tank into which water or other liquid is forced through the pipe B by means of a pump C of any preferred construction having a water-inlet pipe B', this pump being operated by a crank *c*, carried by a shaft *c'* and provided with a pin D, operating in the slot *d* of the plate *d'*, rigidly secured on the guide-bars E and connected with the piston *e* of the pump. The shaft *c'* carries a gear-wheel F, which meshes with a pinion *f* on the shaft *f'* of an electric motor G or other power device, this motor being carried by a support *g*, mounted on the top of the tank. The shaft *c'* also carries a sprocket-wheel H, and the tank is provided with an agitator-shaft *h*, carrying a sprocket-wheel *h'*, a sprocket-chain I being trained around the sprocket-wheels to operate the agitator-shaft, which carries an agitator inside the tank of any preferred construction.

The gas enters the tank from any suitable source of supply through the pipe J, and a pressure-regulator is mounted on the pipe *j* to regulate the supply of gas to the tank. In order to control the operation of the pump automatically, I provide for regulating the supply of water to correspond with the quantity of water drawn from the tank and employ a balance-tank K, connected at its top and bottom with the tank by means of the flexible pipes *k* and supported on one end of the lever L, which carries a weight *l* at its other end. The arrangement is such that the water in the balance-tank will maintain the same level as that in the carbonating-tank, and when the quantity of water in the balance-tank is sufficient to swing the lever on its pivot *l'* the balance-tank will fall and through suitable devices will cut off the current to the motor, and thereby stop the pump.

The devices for switching the current automatically comprise a switch-rod M, connected with the lever L and arranged to operate a two-armed tripper *m*, and thereby shift the switch-bar N, so as to carry the movable contact *n* away from the stationary contacts *n'*. The switch devices are preferably mounted on an insulating-plate O, fastened on one side of the tank; but this is not absolutely necessary, and other arrangements may be employed. The tripper is pivotally secured to the supporting-plate at *m'*, and one of its arms P is provided with an opening *p* to receive the lower end of the switch-rod and operate thereon between the adjustable stops *p'*. The other arm Q of the tripper is arranged to throw the switch-bar N back and forth by engaging the pins *q*, this switch-bar being guided in the straps *q'* and carrying the movable contact *n* on its forward end. This movable contact is preferably in the form of a half-circle, with its ends directed downward to enter between the two members R R' of each stationary contact. The tripper is provided with a

shoulder S behind its pivot, which is arranged in engagement with the end of a plunger T, arranged within a casing *t* and under the influence of a spring *t'*. To facilitate the operation, the plunger is preferably provided with a roller *s* or a rounded surface of some kind for engagement with the shoulder on the tripper.

This being the construction of my invention, the operation thereof is as follows: The water and gas connections having been made and the motor started in operation, the two tanks will fill with water up to the predetermined level and the agitator will operate to thoroughly mix the water and gas. When the water has reached the predetermined level in the mixer-tank and the balance-tank, the weight of the water in the latter will operate to swing the lever L on its pivot, thereby causing the rod M to descend and throw the tripper to shift the switch-bar N, and thereby open the switch, which will result in the stopping of the motor. When a sufficient quantity of the liquid has been drawn off from the tank to permit the weight *l* to return the lever to its original position, the rod will shift the tripper back to its normal position, and thereby carry the movable contact into engagement with the stationary contacts and apply the current to the motor. It will be observed that the tripper is operated quickly to shift the switch, and this operation of the tripper is accomplished by means of the spring-controlled plunger, which throws the tripper quickly to the limit of its movement just as soon as the shoulder S thereon passes the dead-center. In this way I accomplish the switching of the current quickly and prevent sparking at the contacts, as it will be observed that the movement of the switch-rod carries the tripper with it slowly until the shoulder S has passed the dead-center, whereupon the plunger operating against said shoulder will immediately throw the tripper to the limit of its movement and instantly shift the switch-bar. I thus provide for opening and closing the switch by and during the movement of the lever and shifting rod, but with much greater rapidity in order to avoid burning out the contact-brushes.

The switch-bar N is limited in its movement by means of the pins *q*, which engage the straps *q'*, and the arm Q of the tripper engages these pins to shift the switch-bar.

I provide an apparatus which operates quickly and automatically to turn on or shut off the supply of water and regulate the same in accordance with the quantity of carbonated water drawn from the tank, the regulating devices consisting of a switch which is operated to make and break the electric circuit quickly and without sparking.

The tank A, which constitutes the mixing vessel of my improved apparatus, may be made in any desired manner and provided with an agitator of any kind which will operate to agitate the water in the tank and effect a thorough mixture of the gas with the water to obtain a highly-carbonated beverage.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a liquid-carbonating apparatus, the combination with a mixer, of a gas-supply pipe admitting gas thereto, a liquid-supply pipe, a pump for forcing liquid through the supply-pipe to the mixer, an electric motor for operating the pump, a switch device in the electric circuit to the motor and comprising a movable contact, a two-armed tripper having one of its arms arranged to shift the movable contact, and means controlled by the level of the liquid in the mixer for actuating the other arm of said tripper to accomplish the making or breaking of the circuit, substantially as described.

2. In a liquid-carbonating apparatus, the combination with a mixer, of a gas-supply pipe admitting gas thereto, a liquid-supply pipe, a pump for forcing liquid through the supply-pipe to the mixer, an electric motor for operating the pump, a switch device in the electric circuit to the motor, a tripper for throwing the switch, a shoulder at the pivot of said tripper, a spring-controlled plunger operating in engagement with said shoulder and means for operating the tripper controlled by the level of the liquid in the mixer, substantially as described.

3. In a liquid-carbonating apparatus, the combination with a mixer, of a gas-supply pipe admitting gas thereto, a liquid-supply pipe, a pump for forcing liquid through the supply-pipe to the mixer, an electric motor for operating the pump, a pivoted device controlled by the level of the liquid in the mixer, a switch device in the circuit leading to the motor, a tripper having one of its arms arranged to operate the switch device, a rod connected with the pivot device and arranged to throw the tripper and a spring-controlled plunger operating in engagement with the tripper to accelerate its movement, substantially as described.

4. In a carbonating apparatus, the combination with a mixer, of a pump for supplying liquid thereto, an electric motor for operating the pump, an electric circuit, a lever pivotally supported on the side of the mixer and carrying a balance-tank at one end and a weight at the other end, a pipe connecting the balance-tank and the mixer so that the liquid in the balance-tank will maintain the same level as in the mixer, a switch in the electric circuit and comprising a switch-bar, a rod connected with the lever, and a spring-controlled device intermediate of the rod and switch-bar and operated by the rod to shift the switch-bar with great rapidity when the lever oscillates, substantially as described.

5. In a carbonating apparatus, the combination with a mixer, of a pump for supplying liquid thereto, an electric motor for op-

erating the pump, an electric circuit, a switch in said circuit and comprising a switch-bar, a shifting rod and means controlled by the level of the liquid in the mixer for operating said rod, and a tripper device located intermediate of the shifting rod and the switch-bar for shifting the latter and having a loose connection with both the shifting rod and the switch-bar, substantially as described.

CHARLES L. BASTIAN.

Witnesses:
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O. R. BARNETT.