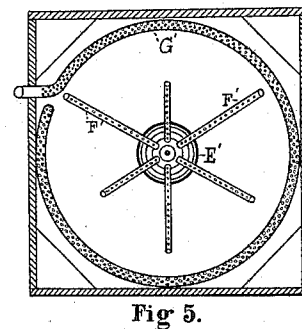
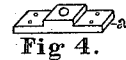
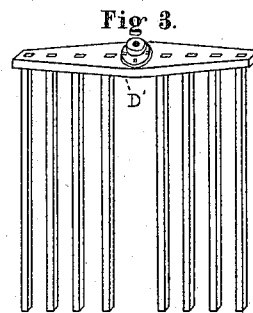
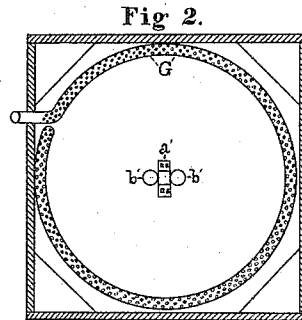
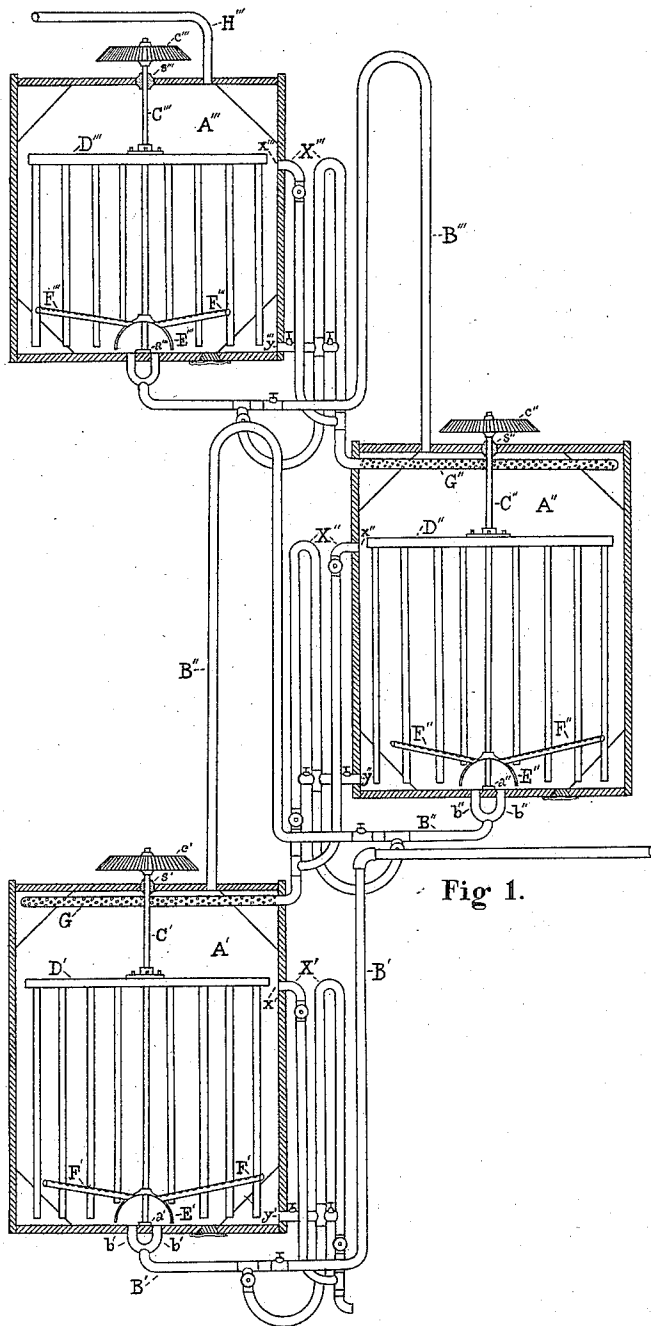


(No Model.)

G. SCHENCK.

PROCESS OF AND APPARATUS FOR CHARGING LIQUIDS WITH GASES.
No. 363,173.

Patented May 17, 1887.



Witnesses:

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GARRET SCHENCK, OF BANGOR, MAINE.

PROCESS OF AND APPARATUS FOR CHARGING LIQUIDS WITH GASES.

SPECIFICATION forming part of Letters Patent No. 363,173, dated May 17, 1887.

Application filed September 11, 1886. Serial No. 213,303. (No model.)

To all whom it may concern:

Be it known that I, GARRET SCHENCK, a citizen of the United States, residing at Bangor, in the county of Penobscot and State of Maine, have invented a new and useful Process of and Device for Charging Liquids with Gases; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved process for the manufacture of bisulphites and generally of impregnating liquors with gases, and an improved device for carrying such process into effect, and is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of tanks in battery with elevation of connections and working parts. Fig. 2 is a horizontal section of tank with plan of perforated pipe. Fig. 3 is a perspective view of dasher. Fig. 4 is a perspective view of step. Fig. 5 is a horizontal section of tank with plan of perforated pipe, receiver, and radial tubes.

Similar letters refer to corresponding parts throughout the figures.

The process for use in which my apparatus is designed consists in introducing gases (as fumes of sulphur) at the bottom of a tank partially filled with the liquor to be treated—as, for instance, a solution of lime. The fumes impregnate the liquor as they rise through it and the residuum of the fumes collecting in the top of the tank is conducted to the bottom of a second tank partially filled with liquor like the first, where the operation is repeated. As many tanks may be used in battery as desired, and the final residuum of the fumes is drawn from the top of the last tank by an exhaust or suction. Further, to facilitate the operation, systems of piping are applied connecting the tanks, whereby the liquor can be drawn at will from an upper to a lower tank.

The object of my invention is to provide a process and apparatus whereby liquors may be charged with gases and bisulphites may be more rapidly and economically produced than by existing devices for the purpose, and with it I believe that a battery of two tanks is sufficient to effect my purpose, although in Fig. 1 I show a battery of three tanks. When two

only are used, the intermediate tank, A'', is dispensed with.

The tanks A', A'', and A''' may be of any convenient form; but are preferably cylindrical. If square, the corners should be filled, as shown in the figures, in order that as little of the liquor as possible may escape the operation of the dasher.

B' is a supply-pipe for conducting the sulphur fumes from the furnace to the lower tank, A'. It enters the bottom of the tank preferably by a U-shaped branch having its mouths b' b' on either side of a narrow step, a', fixed at the center of the inside of the bottom of said tank, and, together with a bearing, s', in the center of the top of said tank, carrying the shaft C', terminating above said tank in a gear-wheel, c', through which power is taken from any convenient source. The shaft carries a dasher, D', of any suitable construction, and near its base an inverted cup or receiver, E', of such diameter as to extend over the mouths b' b' of the supply-pipe B'. This receiver is preferably conical or semispherical in shape; but neither form is absolutely essential. From the top of the cup are radially-projecting tubes F', with open external ends and preferably perforated, as shown, communicating with the interior of said receiver and preferably of graduated lengths and sizes, the longest tube being the largest in diameter. From the top of the tank A' a goose-neck escape-pipe, B'', after rising to a height above the top of the second tank, A'', descends, and by a U-shaped branch enters the bottom of the tank A''.

By any convenient system of pipes, X'', suitably arranged to draw from the tank A'' at different points, as x'' and y'', and fitted with necessary valves and cocks, the liquor is drawn from the tank A'' into the top of the tank A', within which the part G' of the piping is perforated and prolonged, preferably in the form of a coil, and the liquor thus drawn into the tank A' through the perforations of the coil in the form of a spray.

When three tanks are used, as in Fig. 1, the second tank, A'', is fitted in precisely the same manner as the tank A', with shaft and gear-wheel, dasher, receiver, perforated radial tubes, perforated coil, and goose-neck, such coil and goose-neck communicating with the third tank, A'''. The tank A''' is connected with the

tank A" by a system of pipes, X"', with necessary valves and cocks similar to that connecting the tanks A" and A', and is fitted with shaft and gear-wheel, dasher, receiver, and 5 perforated radial tubes, but is without a perforated coil, and at its top is provided with an exhaust-pipe, H"', which communicates with the chimney or any exhaust.

In operation each of the tanks is partially 10 filled with liquor, as indicated in Fig. 1, and preferably through the upper tank, A". The dashers F' F'' F''' are operated, and the liquor in all the tanks thoroughly agitated. The sulphur fumes are admitted through the pipe B' 15 into the receiver E' at the bottom of the tank A', from whence they pass into the tubes F', which are revolving with the shaft C', and, escaping through the ends or perforations in the tubes F', rise through the liquor into the un- 20 occupied top of the tank, and from thence escape through the goose-neck B" into the tank A", where the operation which has been performed in the tank A' is repeated. From the tank A" the fumes pass into the tank A"', and, 25 passing through the liquor therein under the same conditions as in tanks A' and A'', finally escape through the pipe H"', connected with an exhaust. Simultaneously with this operation the liquor may be drawn from either or 30 both the tanks A''' or A" to the tank or tanks below, and is in each case discharged into the tank which receives it through the perforated coils G'' and G', whence it falls in spray through the fumes rising in the top of the tank above 35 the liquor therein contained.

It will be observed that by my invention the fumes are introduced into the liquor, while the latter is in a state of violent agitation, in small jets and at a great number of points 40 through the ends or perforations in the tubes F' F'' F'''; that, furthermore, as these tubes are continually revolving, the discharge of the fumes is very equally distributed throughout almost every portion of the lower part of the 45 liquor, and that a most perfect commingling of the fumes with the liquor is thus obtained.

It should also be noticed that the liquor may be drawn from an upper to a lower tank, and, discharging therein in spray, falls through the 50 fumes in the top of the lower tank, by which it is still further impregnated, while, as usual in such processes, the fumes are used repeatedly until their virtue is exhausted.

The manufacture of the bisulphites is first 55 completed in the lower tank, A', and as the contents thereof or any part of them become of sufficient strength they are drawn off by a system of pipes, X', and replaced from the weaker contents of the tank above, which in 60 turn is replenished from the next above it.

It is evident that my process and apparatus may be used generally for charging liquors

with gases, and that their application is not restricted to the manufacture of bisulphites.

Having thus described my invention, what I 65 claim, and desire to secure by Letters Patent, is—

1. The herein-described process of charging liquors with gases, consisting of forcing the 70 gases into the liquor in a tank through tubes arranged to revolve in said tank beneath the surface of the liquor and simultaneously drawing the liquor from an upper to a lower tank and discharging the liquor in spray or jets into 75 the lower tank above the liquor therein, so that the spray may fall through the gases collected in the top of the lower tank, substantially as described.

2. In an apparatus for charging liquors with gases or for the manufacture of bisulphites, 80 and in combination with a tank and a tube delivering gases therein, an inverted cup or receiver so located and fixed upon a shaft revolving within said tank and operated by power 85 from without as to revolve with said shaft and receive the gases delivered by said tube, and radially-projecting tubes with open external ends rigidly fixed to said receiver, communicating with the interior thereof and revolving 90 therewith, substantially as described.

3. In an apparatus for charging liquors with gases or for the manufacture of bisulphites, 95 and in combination with a tank and a tube delivering gases therein, an inverted cup or receiver so located and fixed upon a shaft revolving within said tank and operated by power from without as to revolve with said shaft and 100 receive the gases delivered by said tube, and radially-projecting perforated tubes with open external ends, rigidly fixed to said receiver, communicating with the interior thereof and revolving therewith, substantially as described.

4. In an apparatus for charging liquors with gases or for the manufacture of bisulphites, 105 having two or more tanks connected by systems of pipes, whereby the gases and liquors may pass or be drawn from tank to tank in opposite directions, a liquor discharging pipe connecting an upper with a lower tank and prolonged within said lower tank, near its top, 110 in any convenient direction, the part within said lower tank being formed with perforations, substantially as described.

5. The herein-described device for impregnating liquors with gases or for manufacturing 115 bisulphites, consisting of the combination of the tank A', gas-supplying pipe B', shaft C', with gear c', dasher D', receiver E', and radial tubes F', substantially as described.

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Witnesses:

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