

(No Model.)

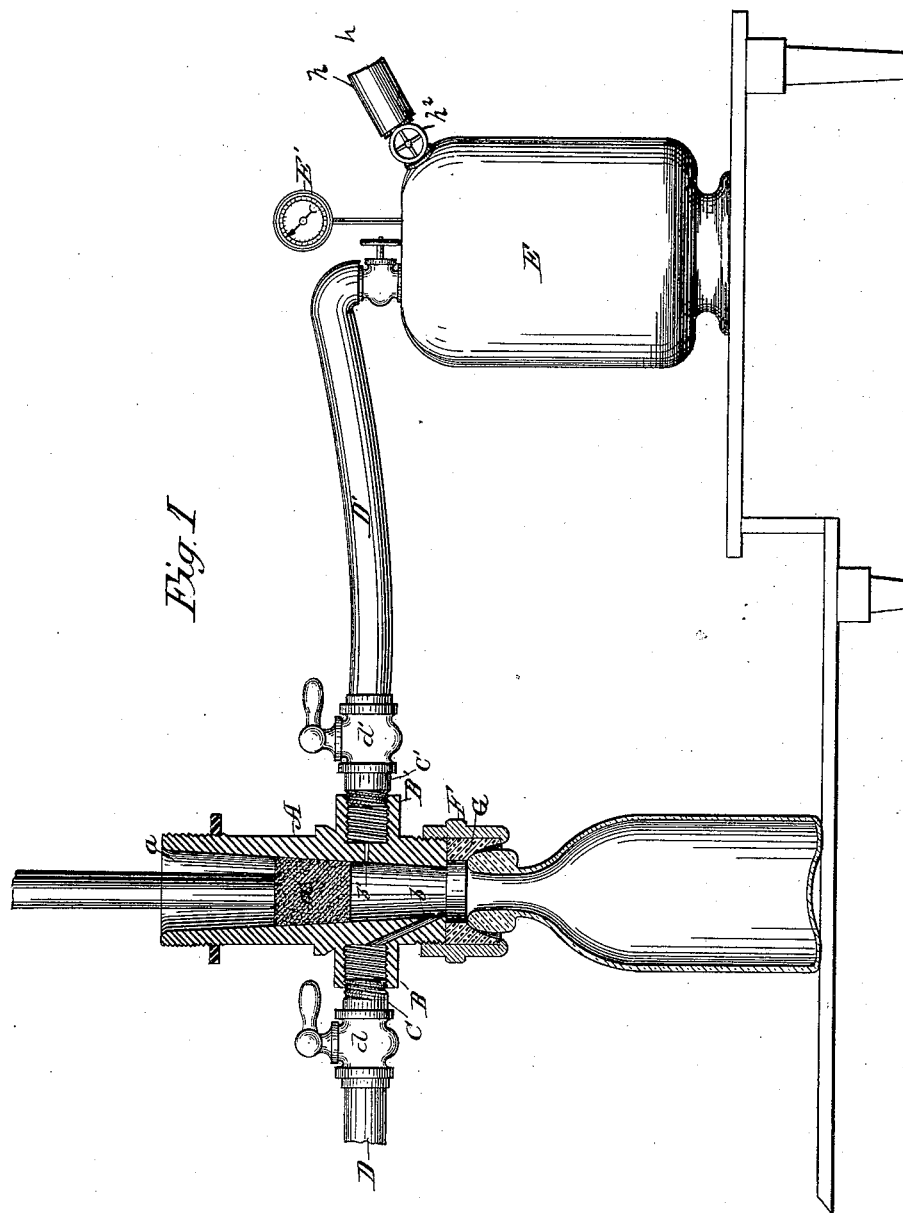
2 Sheets—Sheet 1.

O. ZWIETUSCH.

FILLING CYLINDER.

No. 342,771.

Patented May 25, 1886.



Witnesses:  
C. B. Story.  
A. Klein.

Inventor:  
Otto Zwietsch  
by Hunt & Lundmark  
Attorneys:

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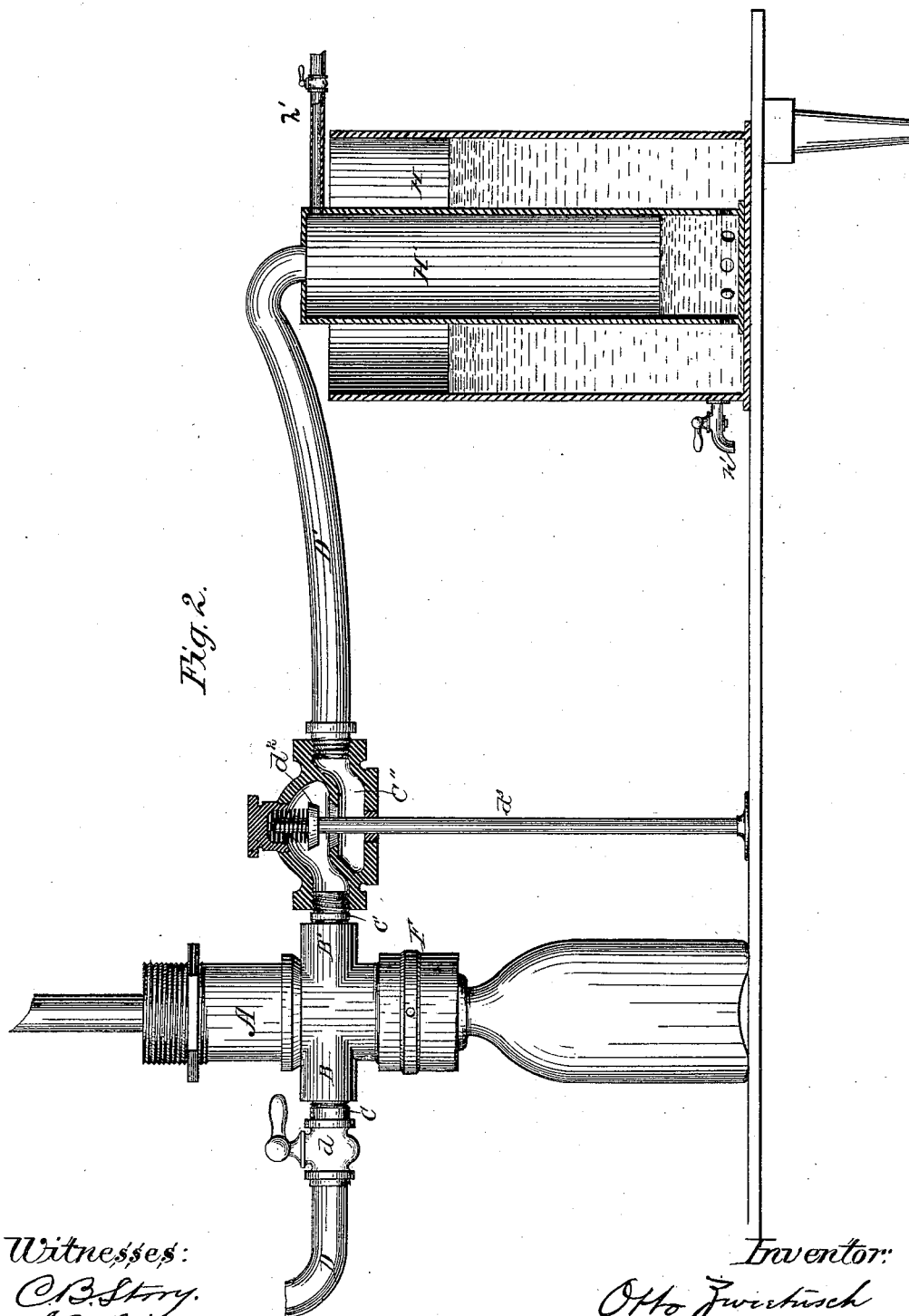
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# UNITED STATES PATENT OFFICE.

OTTO ZWIETUSCH, OF MILWAUKEE, WISCONSIN.

## FILLING-CYLINDER.

SPECIFICATION forming part of Letters Patent No. 342,771, dated May 25, 1886.

Application filed November 6, 1882. Serial No. 76,050. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO ZWIETUSCH, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Filling-Cylinders; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to the filling-cylinders used in filling bottles and other receptacles with carbonated liquids; and the object of my invention is to produce a filling-cylinder by means of which air may be readily exhausted from the bottle or other receptacle by means of gas from a gas-reservoir, and whereby, also, the gas itself may be thoroughly mingled with the liquid when such liquid is carried into the receptacle, and all superfluous gas in the receptacle shall be driven out, this action of the liquid being attained by means of the gas in the reservoir.

To the above purpose my invention consists in a filling-cylinder having oppositely-disposed gas and liquid inlet channels, the liquid-inlet channel having a downward inclination and its inner terminus or opening being below the level of that of the gas-inlet channel.

My invention further consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In the drawings, Figure 1 is an elevation of my device, partly in section. Fig. 2 is an elevation of a modification of the same.

A is a corking-cylinder, having a tapered throat, *a*, for receiving a cork, *a'*. This cylinder also has nipples B B', which are screw-threaded internally to take couplings C C', respectively. The nipple B communicates with the corking-cylinder through an opening, *b*, that slants downward, while the nipple B' communicates with it through a small horizontal orifice, *b'*, the inner terminus of the channel *b* being below that of the opposite gas-inlet channel *b'*, as shown in Fig. 1. The coupling C connects a pipe, D, with the corking-cylinder, and this pipe leads from the tank containing the liquid to be bottled. (Not shown.) The coupling C' connects a pipe, D', with the nipple B', and this pipe D' leads from a gas-reservoir, E, so that the corking-cylinder is connected with both a gas and a liquid reser-

voir. I interpose suitable cocks, *d d'*, between the corking-cylinder and the reservoirs, and I supply the reservoirs from any suitable source, providing the reservoir E with a suitable pressure-gage, E'. I screw a coupling, F, to the lower end of the cork-cylinder, and in this I fit an annular rubber mouth-piece or washer, G, cut out on its under side to take the head of a bottle while it is being filled, and I hold the cork-cylinder down by any suitable means with a pressure sufficient to make the connection between the washer and bottle air-tight.

In using my device I see that the pressure in the gas-reservoir is somewhat less than in the liquid-reservoir. For instance, if the liquid pressure is sixty pounds I fix the pressure in the reservoir E at about fifty-five pounds, and after placing a cork in the cylinder and the bottle under it I open the cock *d'* and let in the gas—carbonic acid—and, as it is heavier than air, it falls to the bottom of the bottle and displaces the air. I then turn off the gas and lift the cylinder to permit the air to be driven out by the carbonic-acid gas, and replacing the cylinder I turn on the gas first, and then the liquid, and as the liquid pressure is the stronger, and as it enters the corking-cylinder below the opening *b'*, it forces the gas out of the bottle and takes its place. Both cocks may now be turned off and the cork driven into the bottle by the plunger K, that has held it in the cylinder A against the gas-pressure. Another cock may now be inserted and the filled bottle replaced by an empty one, and thus the bottles may be rapidly filled without any exposure of the liquid to atmospheric air, and all waste from foaming is prevented; and, besides, as the gas-pressure which the bottles are subjected to is only a few pounds less than the pressure that they will have to sustain when filled with liquid, each bottle will be incidentally tested by my process, and thus a large amount of waste from defective bottles will be avoided.

One of the chief features of my invention is the production of a counter-pressure that, acting against the pressure of the liquid, will prevent foaming and consequent waste, this being due to the fact that the inner terminus of the liquid-channel is below the level of that of the gas-inlet channel, and therefore where I

am bottling beer for home consumption, or that is to be steamed thereafter, I can substitute air for gas, using an intermediate air-reservoir and a water-column, as shown in Fig. 2, in which I provide the pipe D' with a valve-chamber, C'', and a spring-valve, d<sup>2</sup>, from which a stem, d<sup>3</sup>, depends, and then at its end, opposite the valve-chamber C'', I connect the pipe D' with the inner tube, H', of a water-column, H, and into this tube I pump a sufficient quantity of air through a small tube, h', to give a pressure almost equal to that of the liquid which flows through pipe D, which pressure is kept up by the water in column H, the tube H' acting as a reservoir for the air, the density of which increases as each bottle is filled, for the air which is expelled from the bottles as they are filled with liquid must pass into the tube or pipe D' and produce a back-pressure on the water in the tube H', forcing it out to increase the height of the column in tube or pipe H; and when the outer column of water gets so high that the pressure approximates too closely to that in wine-reservoir I may let some of it out through cock h<sup>2</sup>.

The operation of this modification of my device is as follows: As soon as the cork-cylinder A is clamped upon the bottle the rod d' will strike the table or floor upon which the bottle rests, and will be driven up so as to lift valve d' from its seat. The air will now rush into the cylinder, and at the same time I turn cock d to admit the beer or other carbonated liquid that is to be bottled, and this liquid will expel the air from the bottles into the tube D' and take its place, the counter-pressure from the water column serving to prevent bubbling or foaming.

It is obvious that my invention will be equally useful in filling fountains, casks, or any other

receptacles with carbonated liquid, whether it be wine, beer, or aerated waters.

I am aware that filling-cylinders have heretofore been provided with oppositely-disposed gas and liquid inlet channels, and that the latter has been arranged on an incline; but in all such previous devices the inner openings of such channels have been upon the same level, and consequently the action of the filling-cylinder has been imperfect, and the results of my improved arrangement could not be attained.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An improved filling-cylinder having a channel for liquid and a channel for gas opening through its sides, the inner terminus of the liquid-channel being below the level of that of the gas-channel, substantially as described.

2. An improved filling-cylinder having a channel for liquid and a channel for gas opening through its sides, the liquid-channel being inclined downward and having its lower or inner terminus below the level of the inner terminus of the gas-channel, as set forth.

3. The cylinder A, having the tapered throat a and the nipples B B' and provided with the horizontal gas-channel b', opening from nipple B', and also with the oblique gas-channel b, opening from nipple B and entering the throat of said cylinder below the level of channel b', in combination with the coupling F and packing-ring G, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, on this 10th day of October, 1882, in the presence of two witnesses.

OTTO ZWIETUSCH.

Witnesses:

STANLEY S. STOUT,  
H. G. UNDERWOOD.