

(No Model.)

3 Sheets—Sheet 1.

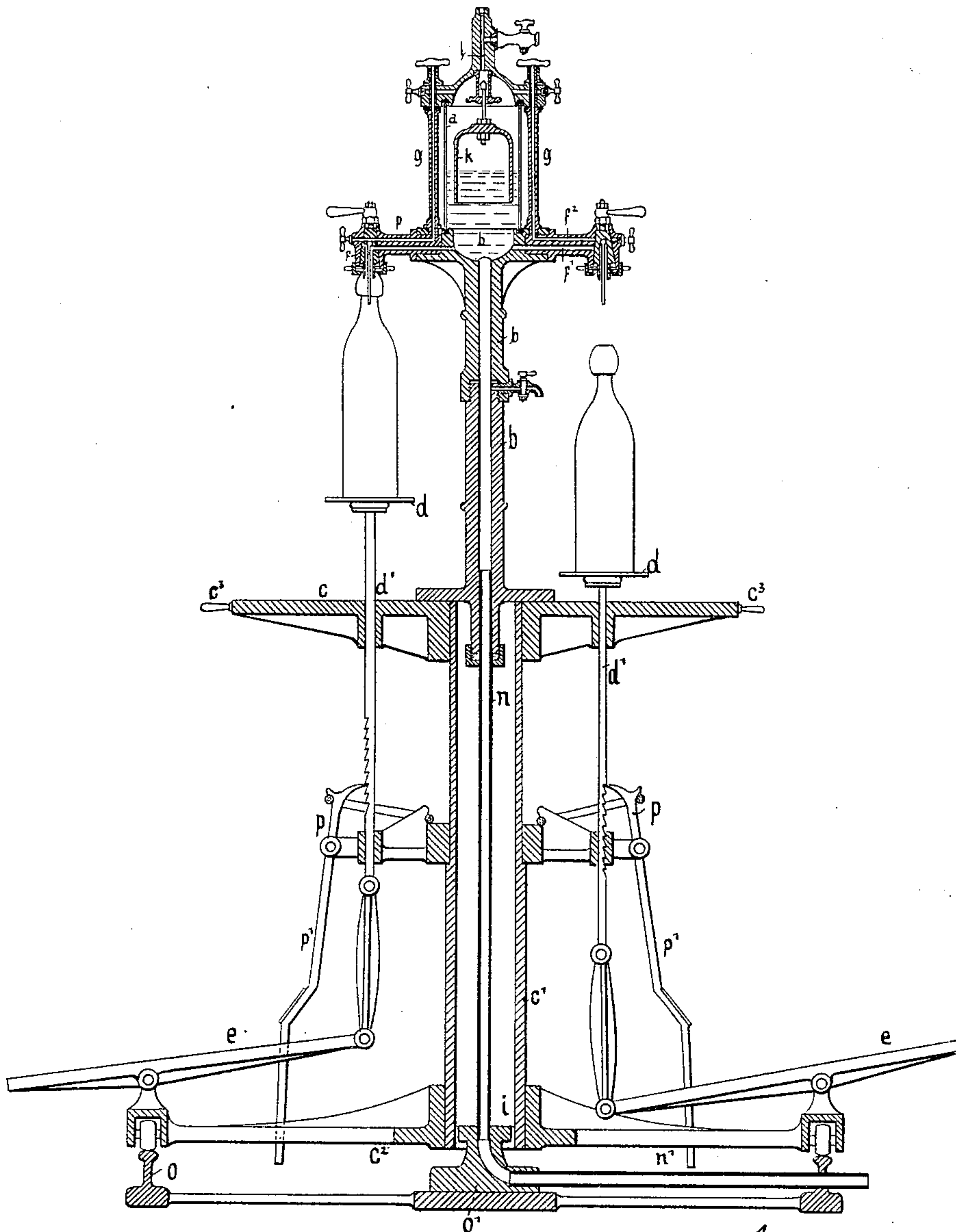
L. A. ENZINGER.

BOTTLING AND CASK FILLING APPARATUS.

No. 388,272.

Patented Aug. 21, 1888.

Fig. 1.



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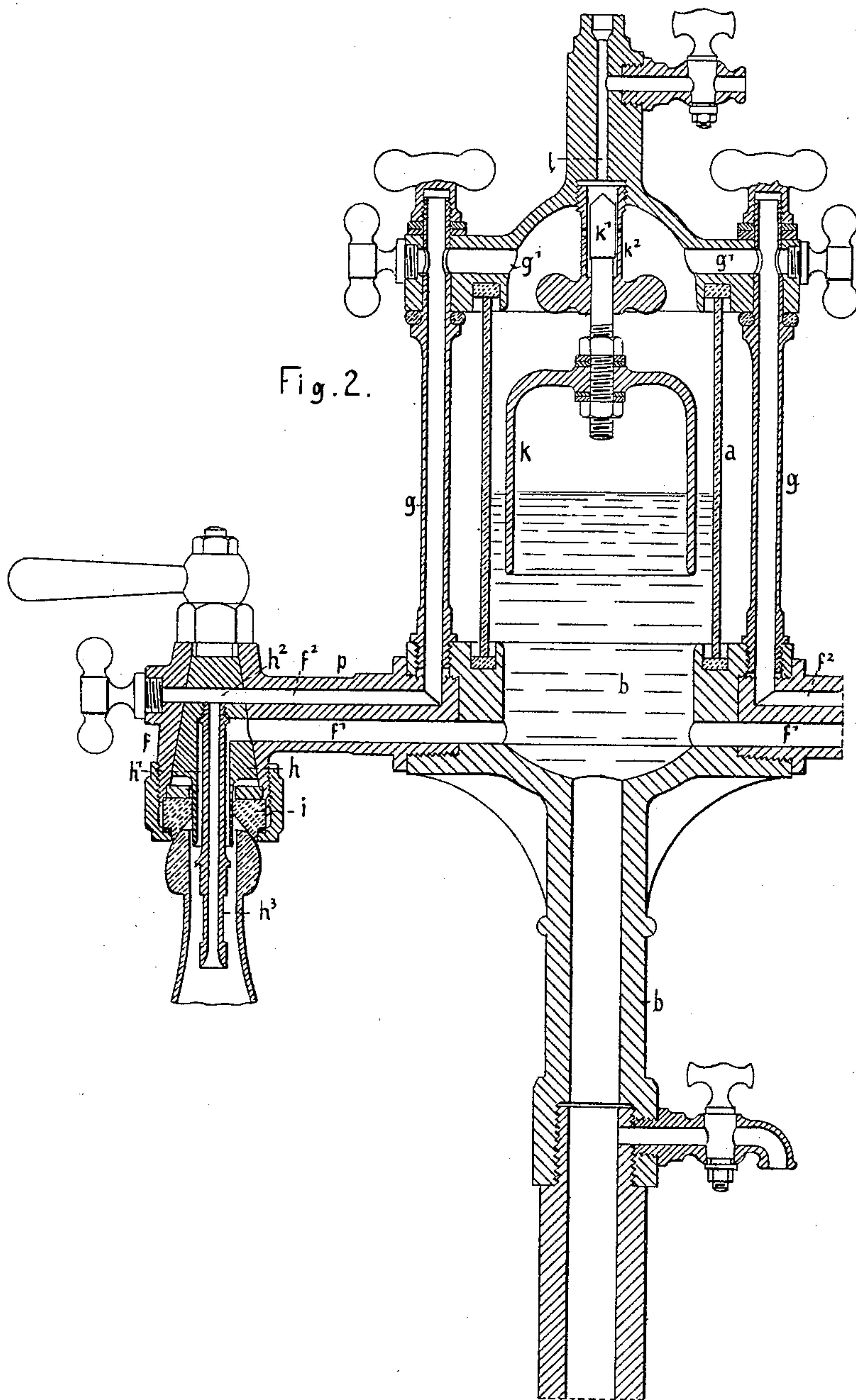
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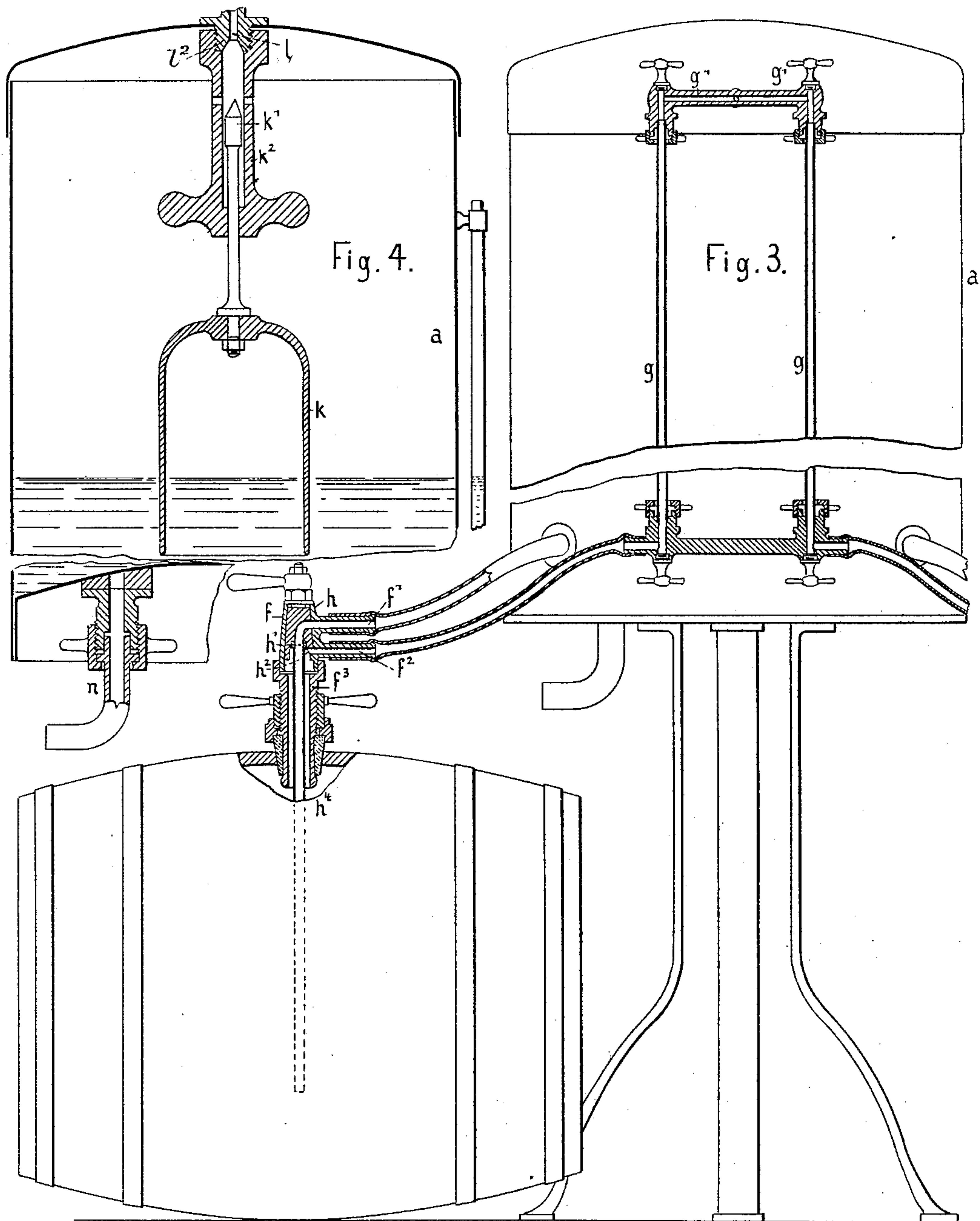
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UNITED STATES PATENT OFFICE.

LORENZ ADALBERT ENZINGER, OF WORMS, HESSE, GERMANY.

BOTTLING AND CASK-FILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 388,272, dated August 21, 1888.

Application filed July 13, 1887. Serial No. 244,181. (No model.)

To all whom it may concern:

Be it known that I, LORENZ ADALBERT ENZINGER, residing at Worms, in the Grand Duchy of Hesse, Germany, have invented certain new and useful Improvements in Bottling and Cask-Filling Apparatuses, of which the following is a specification.

My invention relates to apparatus for filling bottles, casks, or barrels and the like with gaseous liquids—such as beer, for example; and the improvements consist, essentially, in the employment of a special arrangement for introducing compressed air into the bottle or other receptacle before admitting the liquid, the compression of the said air being produced by the action of the liquid itself. For the purpose of enabling the operation to be rapidly performed when filling or decanting liquids into bottles, the apparatus is arranged to have a rotary motion.

In order that my said invention may be fully understood, I will now proceed more particularly to describe the same; and for that purpose shall refer to the several figures on the annexed three sheets of drawings, the same letters of reference indicating corresponding parts in all the figures.

Figure 1 represents in vertical section a bottle-filling apparatus constructed according to this invention. Fig. 2, drawn to a larger scale, shows, likewise in section, the most important parts of the said apparatus. Figs. 3 and 4 represent, respectively, a general view and a detail, likewise partly in section, of an apparatus arranged for filling casks.

The bottle-filling apparatus, Figs. 1 and 2, is constructed with a chamber or vessel, *a*, mounted on a central hollow shaft or pillar, *b*, supported on a rotary table, *c*, and with a suitable number—say eight—of plates, *d*, for the reception of the bottles attached to vertically-sliding rods *d'*, connected by links at their lower extremities to treadle or foot levers *e*. The vessel *a* is provided with taps or cocks *f*, situated over the aforesaid plates. Each cock is in communication with the lower part of the vessel through a passage, *f'*, Fig. 2, and is connected with the upper part of the vessel by

a passage, *f''*, a pipe, *g*, and a passage, *g'*. The plug *h* of each cock is provided with two angular passages or perforations, *h'* and *h''*. The passage *h'* corresponds with the passage *f'*, and the passage *h''* corresponds with the passage *f''*, and a tube, *h'''*, extending downward from the passage *h''* through the central or axial limb of the passage *h'*, forms a prolongation of the said passage *h''*, and projects beyond the tubular lower part of the plug *h*. The said passages or perforations in the plug *h* are so arranged that when the plug is placed in a certain position the perforation *h''* and passage *f''* only are placed in communication, and when the plug is placed in a certain other position both the perforations *h'* and *h''* are connected with the corresponding passages, *f'* and *f''*. A ring or washer, *i*, of rubber or other suitable material, is supported at the lower part of the body or case of the cock by a nut or gland, being hollowed out at its under side for the reception of the mouth of the bottle, which is pressed against the said ring or washer by means of the foot-lever *e*.

The cover of the vessel *a* is provided with a passage, *l*, leading to the exterior, and in the interior of the vessel there is a float, *k*, connected to a rod, the upper extremity of which forms a valve, *k'*, which opens or closes the passage *l* according as the liquid, and consequently the float, rises and falls in the vessel *a*. The float is guided by a tube, *k''*, in which the rod slides, and which is provided with lateral orifices for the escape of air from the vessel or chamber *a*. The lower part of this chamber is connected by the hollow pillar *b* with a pipe, *n*, leading from the vessel containing the liquid to be bottled. In order to enable the hollow pillar *b* to turn with the table *c*, to which it is fixed, a stuffing-box connection is provided between the said pillar and the pipe *n*. The sides of the chamber *a* are preferably made of glass, in order that the position of the liquid therein may be seen.

The table *c* is supported upon a central hollow leg or pillar, *c'*, rising from the center of a frame or plate, *c''*, provided with rollers traveling upon a circular track or rail, *o*, and turn-

ing upon a fixed pivot, o' , engaging with the lower end of the hollow leg c' . The table, together with the chamber a and the mechanism for raising the bottles, is by this arrangement enabled to turn upon the pivot o' and vertical part of the pipe n . Handles c^3 are provided for convenience in turning the table. In order to hold up the bottles and retain them securely in the elevated position, pawls p are employed, which, by means of rubber springs, are caused to engage with ratchet-teeth in the sides of the bars d' , being provided with a pendent arm, p' , by pushing which with his foot the operator can disengage the pawl and release the bottles.

In order to start this apparatus, all the cocks f are closed and the pipe n is placed in communication with the vessel containing the supply of liquid. The pressure of the air or gas in this vessel forces the liquid up the pipe n and pillar b into the chamber a . At first this has the effect of expelling air from the said chamber through the passage l ; but when the liquid has risen to a certain height in this chamber the float k is elevated and causes the valve k' to close the outlet-orifice. The air remaining in the chamber is then compressed until its pressure balances that under which the liquid is forced into the chamber. A bottle being then placed on one of the plates d , and its mouth forced up against the ring i of the corresponding tap or cock by means of the foot-lever e , the plug of the cock is turned (through one-quarter of a revolution, for example) in such a manner that communication is made between the passage f^2 and the perforation h^2 only. Compressed air then passes out of the upper part of the chamber a through the passages $g' g f^2$, perforation h^2 , and tube h^3 into the bottle until the pressure in the latter is equal to the pressure in the chamber a . The handle of the cock or tap being now manipulated, so as to turn the plug farther and place the perforation h' in communication with the passage f' , (without closing the communication between h' and h^2 ,) the liquid in the chamber a immediately flows into the bottle through f' and h' , while the air contained in the latter reascends into the chamber a through h^3 , h^2 , f^2 , g , and g' . After filling the bottle the liquid rises in these air-passages until it stands at the same level in the pipe g as in the chamber a ; but the level of the liquid is prevented from rising beyond a certain point in the neck of the bottle by suitably arranging or adjusting the length of the tubes for the ingress of liquid and egress of air in said neck. The bottle being thus filled up to the required point in the neck, the cock is closed and the bottle removed from the apparatus, to be immediately corked or stoppered. When the compressed air flows out of the chamber a into the bottle, the liquid rises in the chamber and sinks on the other hand as the air returns during the filling of the bottle. The volume of air thus passing into the cham-

ber is made up of the volume that was previously forced into the bottle and that which was already contained in the bottle at the commencement of the operation. Consequently the liquid is caused to sink in the chamber a to a greater extent as each bottleful of air enters the upper part until a certain point is reached, where the float k , which naturally descends with the liquid, ceases to maintain the valve k' closed, and thus allows the superfluous air to escape until the valve is again closed by the rising of the liquid to its normal level.

Two persons are employed in working the machine, one being occupied with putting in the empty bottles, opening the cocks, and intermittently turning the table by the handles c^3 , while the other closes the cocks and removes and corks the filled bottles.

The essential parts of the apparatus for filling casks with gaseous fluids, and illustrated in Figs. 3 and 4, are the same as in the bottling apparatus, the foot-levers being of course omitted and the rotary arrangement dispensed with. The size of the vessel or chamber a is duly proportioned to the dimensions of the casks to be filled, and is connected with the cocks f by two rubber or flexible tubes, one of which connects the bottom of the chamber with the passage f' , while the other connects the pipe leading to the upper part of the chamber with the passages f^2 . In this arrangement the passage f' is placed above the passages f^2 , and the horizontal part of the perforation h' in the plug h is placed above the corresponding part of the perforation h^2 , in order to render it possible to connect the vertical part of the perforation h' with a tube, h^4 , which conducts the liquid to the bottom of the cask. The body of the cock is connected with a tube, f^3 , which conducts the air from the cask to the perforation or passage h^2 in the plug, and is provided with a ring or collar which fits into the bung-hole. The action of this apparatus being the same as that of the bottling-machine, it will readily be understood without further description. The vessel a , if made entirely of metal, as shown by Figs. 3 and 4, may be provided with a gage-glass, as shown in the drawings, Fig. 4, for indicating the level of the liquid therein, and the cover in this instance being formed separately, as shown, and having the piece in which the passage l is formed secured therein by any suitable means. This piece has a screw-threaded protuberance, l^2 , which screws into a socket in the upper end of the tube h^2 , and thus makes the passage through the two parts continuous, as in the other form.

I claim as my invention—

In apparatus for filling bottles, casks, barrels, or other like receptacles with gaseous liquids, the combination of a vessel or chamber, a , with supply-pipe n and air-passage l , having a valve therein, a float connected to said valve, a tap or cock, f , with plug h , hav-

ing the perforations h' and h^2 , passage f' leading from the bottom of the vessel a to the perforation h' , and passage $f^2 g g'$, connecting the top of the said vessel with the perforation h^2 , substantially as and for the purpose described.

5 In testimony whereof I have hereunto set my

hand in the presence of two subscribing witnesses.

LORENZ ADALBERT ENZINGER.

Witnesses:

HENRY SPRINGMANN,
F. VON VERSIN.