

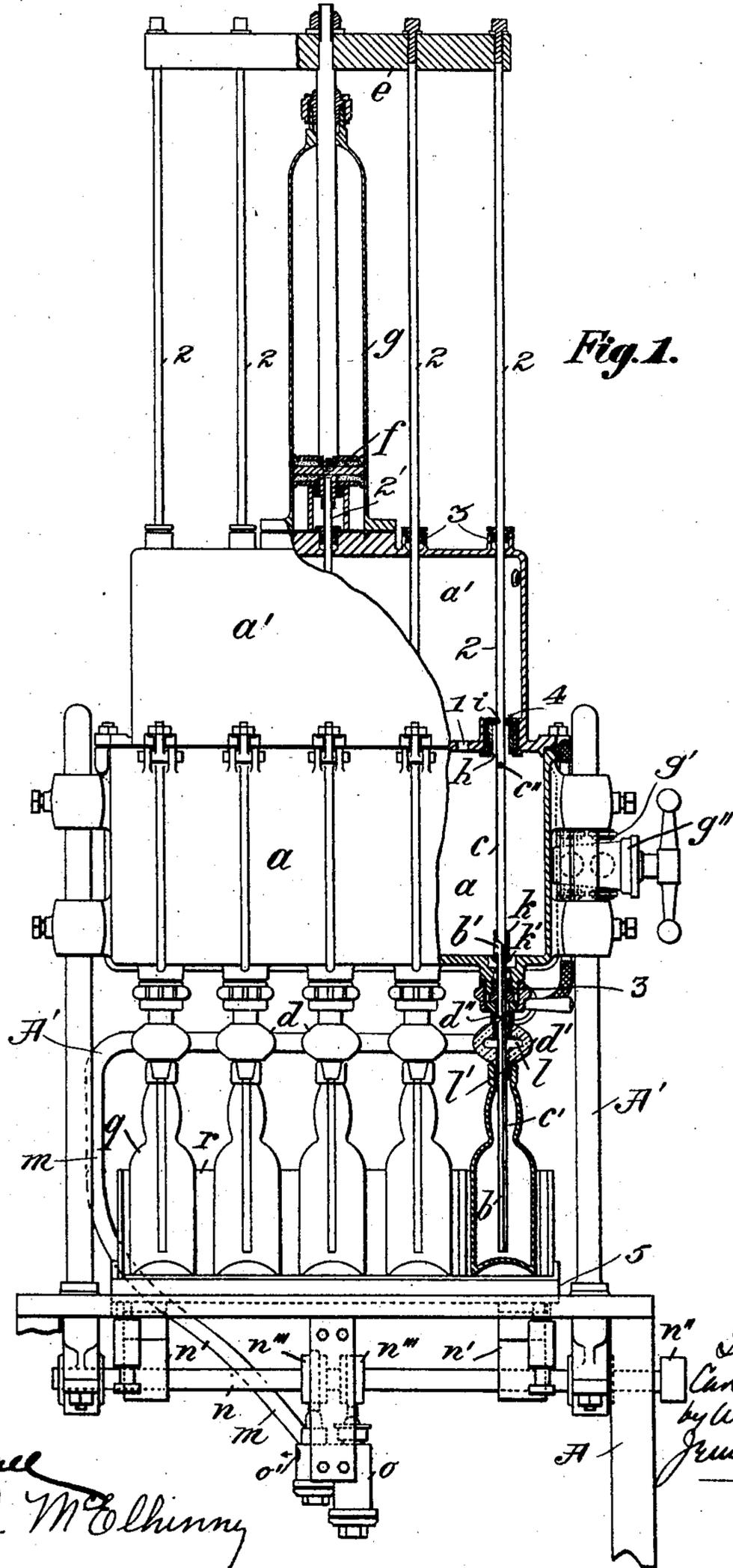
No. 814,169.

PATENTED MAR. 6, 1906.

C. SELLENSCHIEDT.
APPARATUS FOR DECANTING LIQUIDS.

APPLICATION FILED MAR. 16, 1904.

3 SHEETS—SHEET 1.



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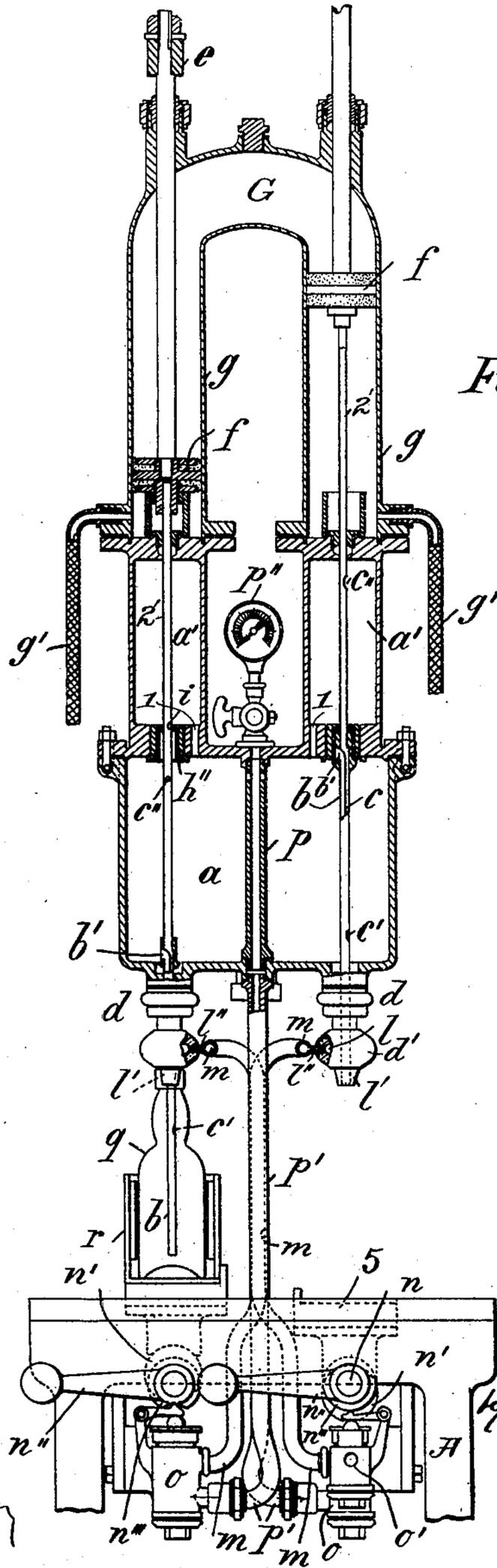


Fig. 2.

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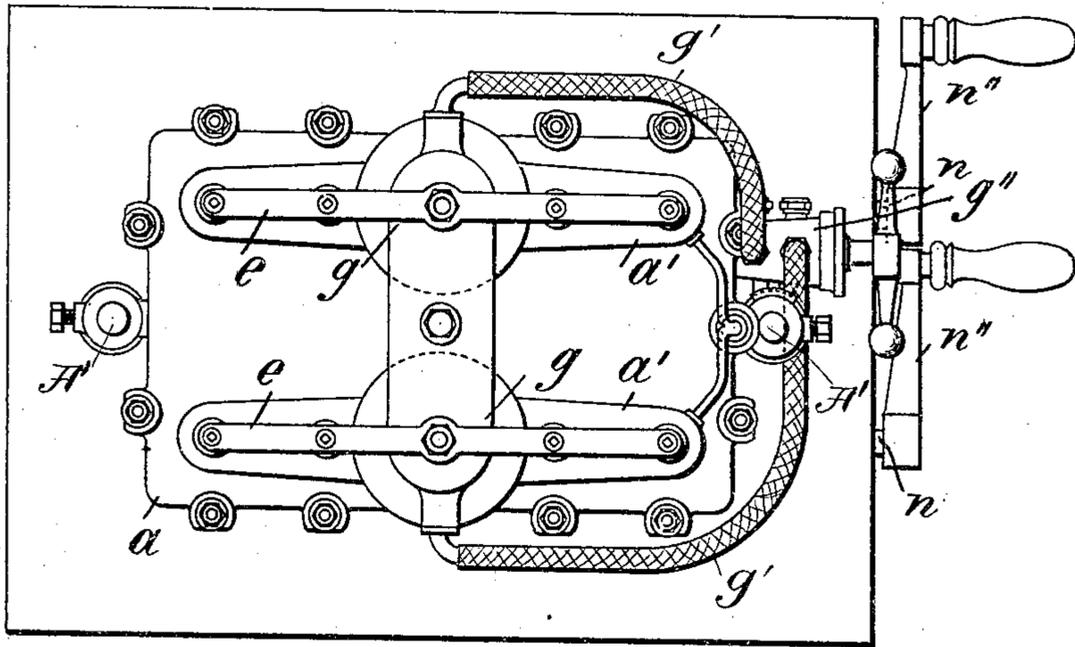
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR DECANTING LIQUIDS.

No. 814,169.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed March 16, 1904. Serial No. 198,369.

To all whom it may concern:

Be it known that I, CARL SELLENSCHEIDT, of No. 82 Belle-Alliancestrasse, Berlin, Germany, have invented certain new and useful
5 Improvements in Apparatus for Decanting Liquids, of which the following is a full, clear, and concise specification.

My invention relates to improvements in apparatus for decanting liquids under pressure; and it consists in various novel and advantageous features of operation and construction, as will be hereinafter more fully described, and more particularly pointed out in the appended claims.

15 Referring to the accompanying three sheets of drawings, forming a part hereof, Figure 1 is a side elevation, with parts broken away and shown in vertical section, of one form of embodiment of my invention. Fig. 2 is an
20 end elevation of Fig. 1 with the air and liquid chambers and the cylinders shown in central vertical section and also with parts broken away from the filling-heads, and Fig. 3 is a top plan view.

25 As illustrated herein, the invention is shown embodied in a duplex apparatus for filling bottles; but it is equally capable of use for filling other kinds of receptacles. The several parts are conveniently supported on a
30 frame or standard A, having pillars A' A', upon which the vessel a is adjustably supported. The vessel a is adapted to contain the liquid to be decanted and also air or other gas under pressure, and the space for the gas is shown herein as being increased or enlarged
35 by means of two auxiliary superposed chambers or vessels a' a', secured as a cover to the top of the vessel a and having communication therewith through the ports 1. The
40 bottles g or other receptacles to be filled are supported in rows on platens underneath the vessel a and are put into communication therewith through a number of filling-tubes 2, which are adapted to be moved longitudinally through the liquid and gas spaces of the
45 vessels a a' and protrude a greater or less extent into the interior of the bottles. The means by which the bottles are coupled with the tubes and the receptacle comprise special
50 expanding cushion-nozzles d, through which the tubes pass, as will be hereinafter fully explained.

In the duplex apparatus shown a set or row of filling-tubes is provided, respectively,

on each side of the apparatus, and a simple 55 easily-controlled motor mechanism is provided for alternately reciprocating the tubes of each set in a vertical direction, so that one set or tray of bottles may be removed while the other set is filling. To this end the two
60 cylinders g g are mounted in line with the filling-tubes above the vessels a' a', and the pistons f f thereof are connected, respectively, with extensions of the tubes of each side by means of the two cross-heads e e. In appa-
65 ratus involving an odd number of tubes to a side, as shown in the drawings herewith, the extension of the central tube of each set may be conveniently attached directly to the piston within its cylinder g, as shown at 2', Fig. 70
1. The two cylinders g g are in communication at their upper ends through the confined passage G, and on the opposite sides of their pistons they are connected with pipes g' g', which lead to the valve mechanism g'',
75 Fig. 3, by means of which fluid-pressure from any convenient source may be supplied alternately to either cylinder. The construction of the valve mechanism g'' forms no part of the present invention, being simply an ordinary two-way valve having suitable ports for directing the fluid-pressure into one pipe g' and simultaneously exhausting or venting the other. It is manifest that the actuation of one piston in an upward sense will be im-
85 parted through the medium contained in the confined passage G to the other piston and cause a downward motion thereof, and vice versa.

The top of vessel a' and the bottom of ves- 90 sel a, where the tubes 2 enter and leave them, respectively, are supplied with glands or stuffing-boxes 3. The said tubes or such portions of them as reciprocate within the vessels a and a' are formed each with two con- 95 duits or passages, (lettered, respectively, b c.) The one, b, is a discharge-conduit and is adapted to extend when depressed to or near the bottom of the bottle, where it debouches, and its upper orifice b' is formed in a surround- 100 ing sleeve k, having a bottom flange k'. The orifice b' is so located on the filling-tube that under the reciprocation of the latter it will pass alternately into the liquid and gas spaces of the vessel a, and at the uppermost point of 105 its traverse it cooperates with a fixed valve-seat 4, by means of which the said orifice is closed against the escape of the contents of

the vessel *a* therethrough. The valve-seat 4 may be conveniently formed as a part of the attached vessel *a'*, being comprised of two annular packing-rings *h i*, into which the sleeve *k* is adapted to enter, as shown at the right hand of Fig. 2. The other conduit (designated *c*) is an escape-conduit for the air or gas forced out of the bottle by the entering liquid, and for this purpose it has its lowest opening at a point *c'* on the filling-tube, which point, as will be presently observed, serves to determine the level to which the bottle is filled and is therefore located near the region of the mouth of the bottle when the filling-tube is in its depressed or operative position. From the point *c'* the escape-conduit extends upwardly beyond the orifice *b'* of the other conduit to a point such as *c''*, which is at all times above the level of the liquid in vessel *a* irrespective of the position of the filling-tube, the said upper orifice being capable of passing freely through the stationary valve-seat 4.

The filling-heads *d d*, by means of which the bottles are put in communication with the filling-tubes 2, consist of hollow rubber members or elastic cushions *d'*, secured to the tubular prolongations *d''* of the lower stuffing-boxes 3 3, and each is provided with an elastic annular projection *l'*, adapted to be expanded within and against the interior wall of the mouth of the bottle. The interior chamber *l* of the member *d'* is connected by nipple *l''* with a pipe *m*, common to all the filling-heads of a side, through which fluid-pressure may be supplied to them, so that when the bottle-mouth is in place over the nozzle *l'* the latter may be expanded by inflation to produce a tight joint. The extent to which the cushion *d'* is able to expand toward the bottle will be amply sufficient to equalize all ordinary differences in bottle heights and irregularities of formation. The filling-tubes 2, which slide through the nozzles *l'*, are so formed or proportioned with respect to the said nozzles as not to obstruct communication between chambers *l* and the interiors of the bottles, so that the compressed gas of the filling-heads is allowed to escape into the bottles as soon as the coupling is effected to establish a counter-pressure therein or at least increase the pressure as a preparation for a counter-pressure to be subsequently transmitted through the filling-tubes. A pressure-gage *p''* is in communication with the vessel *a* between the chambers *a' a'*.

It will be observed that only a slight relative movement of the bottle toward the filling-nozzles will be required in order to bring their open mouths over the nozzles, and, as shown herein, this movement is effected by means of two movable platens 5, upon which the rows of bottles are supported, there being one platen on each side of the apparatus.

Each platen is suitably guided in the framework of the apparatus and rests at its opposite ends upon two cams *n' n'* on the shaft *n*, the latter being provided with any suitable operating-cranks at the end of the apparatus, as shown by *n''*. Preferably, however, these cranks are secured in similar angular relation to their respective cams, so that they will interfere should it be attempted to elevate both platens at the same time. The lift of the platens effected by the cams is sufficient to bring the mouths of the bottles well over their respective filling-nozzles, as shown in the drawings.

For the purpose of simplifying the manipulation of the apparatus as much as possible the several operations of elevating, coupling, uncoupling, and depressing the bottles are designed to be performed by the simple manipulation of the aforementioned cranks *n''*, and for this purpose each shaft is provided with two notched disks *n'''*, respectively adapted to control valve mechanism *o*. This valve mechanism is in duplicate, there being one for each side of the apparatus disposed beneath its respective platen and in permanent connection with the gas-space of vessel *a* through the pipe *p'* and interior pipe *p*, the latter being provided with apertures opening into the chamber *a* above the liquid-level therein. Each valve mechanism is mechanically related to its notched disks, so as to be opened thereby as the cams reach their highest position, for communicating the pressure of chamber *a* through pipe *m* to the filling-heads and for exhausting the same through the vent-orifice *o'* when the cams begin to descend upon further rotation. The specific construction of this valve mechanism forms no part of the present invention except in the relation of its functions to the other parts of the apparatus, and therefore a detailed description of the same is omitted, it being understood that various kinds of valve devices can be employed to perform the same functions. As indicated in the drawings, the operation of the valves by the disks is effected by means of interposed transmission-levers adapted to enter the notches and permit the elevation of projected valve-stems. In using the apparatus thus equipped it is therefore only necessary after the bottles have been placed in their tray *r* to throw the appropriate lever outwardly, which elevates the platen by means of the cams and at the same time opens the valve mechanism *o* to supply fluid-pressure to the cushions *d'*, thereby coupling the bottles to the said cushions and causing a counter-pressure in them, or at any rate preparing for a counter-pressure. It then remains to depress the tubes into the bottles, the tubes being of course in extreme elevated position during the act of coupling, in which position both openings of the escape-conduits *c* are within the vessel,

and the upper discharge-opening b' is closed by the valve-seat 4. Upon appropriate manipulation of the valve g'' the tubes begin to descend, and as soon as the openings b' are withdrawn from their closing devices 4 connection is established between the gas-space of the vessel a and the interior of the bottle to establish the required counter-pressure therein if the same has not already been effected in them by means of their connection with the filling-nozzles. In any event an equalization of pressure is immediately brought about. The further descent of the tubes carries the port-openings b' below the level of the liquid, and the pressures in both receptacles being equal a natural flow takes place at once, beginning almost immediately at the bottom of the bottles, because the descent of the tubes is fairly rapid as compared with the time required for the liquid to traverse the conduit b . By this depression the lower orifice c' of the escape-conduit is brought within the neck of the bottle. Filling of the bottles continues until the level therein reaches the upper edge of the said orifice c' , above which point there obviously remains a space filled with the gas which could not escape into the vessel a through the conduit c . The valve mechanism g'' is now appropriately actuated to elevate the filling-tubes, another set of bottles having in the meantime been placed upon the other platen, and during the interval in which the openings b' rise through the liquid-space of vessel a and into the gas-space thereof sufficient liquid will flow down into the bottles to fill up the spaces therein caused by the removal of the tubes. The orifice c' meanwhile will be passed through the cushion d' without having allowed the gas therein to escape, since the narrow escape-conduit c is filled with liquid and the motion is too rapid to admit of the gas overcoming the capillary action in the conduit. By further rotating the crank 45 the pipe m , and likewise the chambers l , are vented or exhausted and the depression of the platen follows, whereupon the filled bottles may be removed.

It will be observed that by the construction above outlined the use of valves in the gas and liquid conduits is obviated and that the required counter-pressure may be produced and the liquid transferred to the bottles with the greatest regularity. The supplementary filling of the bottles after the tubes have been withdrawn by the drainage of the contents thereof serves to avoid troublesome and wasteful dripping from the filling-heads, as usually encountered in many prior machines of this kind.

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

1. In a decanting apparatus, a vessel for containing liquid and a gas under pressure

and a filling-tube mounted to move therein, provided with a conduit opening within said vessel and leading to the exterior thereof, the said conduit being adapted to discharge liquid into the receptacle to be filled or to equalize the pressure in the receptacle and vessel according to the position of its said opening above or below the liquid-level in said vessel. 70

2. In a decanting apparatus, a vessel for containing liquid or a gas under pressure and a filling-tube mounted to move therein provided with a discharge-conduit leading to the exterior of the vessel with its upper opening within the vessel and adapted to be disposed above or below the liquid-level therein, means for coupling the receptacle to be filled with said conduit, in combination with means for moving said upper opening through the gas to the liquid to produce an equal pressure in the receptacle before filling the same, and means in said filling-tube for venting the gas in the receptacle into said vessel. 80 85

3. In a decanting apparatus, a vessel for containing liquid and a gas-space therein, a filling-tube mounted to reciprocate within said vessel and to protrude within the receptacle to be filled, said tube being provided with an aperture located therein at a point which is alternately in the air-space and the liquid, in combination with means for joining the said receptacle with the said filling-tube. 90 95

4. In a decanting apparatus, a vessel for containing liquid and gas under pressure and a filling-tube adapted to be reciprocated within the vessel and to protrude within the receptacle to be filled, in combination with a conduit in said tube leading to the exterior of said vessel and having a port opening within the same, said port being so located on the reciprocating tube as to be alternately above and below the liquid-level, and a valve-seat contained within the gas-space for closing said port. 100 105

5. In a decanting apparatus, a vessel for containing liquid and a gas under pressure, a filling-tube mounted to reciprocate therein and provided with a liquid-discharge conduit having its upper opening within the vessel and adapted to pass alternately into said gas and liquid, and a valve-seat for closing said opening within the gas-space, in combination with means for reciprocating said tube to cause the said upper opening to pass from engagement with said seat through the gas-space and into the liquid, and an escape-conduit in said tube having its upper orifice disposed at a point in said tube at all times within the said gas-space. 110 115 120

6. In a decanting apparatus, a vessel for containing liquid and gas under pressure, a filling-tube sliding therein and adapted to be protruded into the receptacle to be filled, a conduit in said tube leading to the exterior of the vessel and having its upper orifice located at a point in the tube which may pass above 125 130

and below the liquid-level in said vessel, in combination with an inflatable coupling-nozzle for connecting the receptacle with said filling-tube adapted to increase the gas-pressure within said receptacle.

7. In a decanting apparatus, a vessel for containing liquid and gas under pressure, a filling-tube reciprocating therein provided with a conduit adapted to be protruded into the receptacle to be filled and having its upper opening within the vessel at a point on the said tube alternately above and below the liquid-level, in combination with a filling-nozzle for coupling the receptacle with the said conduit and a controlled communication between said nozzle and the gas in the vessel to establish a counter-pressure in said receptacle.

8. In a decanting apparatus, a vessel for containing liquid and gas under pressure and a filling-tube mounted to be reciprocated within said vessel and to protrude within the receptacle to be filled, in combination with a conduit in said tube leading to the exterior of the vessel and having an upper opening adapted to pass alternately into said gas-space and the liquid and an escape-conduit in said tube for venting the said receptacle.

9. In decanting apparatus, a vessel for containing liquid, and gas under pressure, a reciprocating filling-tube within said vessel having discharge and escape conduits therein, the said discharge-conduit leading to the exterior of the vessel and having an orifice within the vessel adapted to pass above and below the level of the liquid therein and the said escape-conduit adapted to extend to the exterior of the said vessel but having an orifice within the same located at a point on said tube which remains above the liquid-level, in combination with means for connecting the receptacle to be filled with said filling-tube.

10. In a decanting apparatus, a closed vessel for containing liquid and gas under pressure, a reciprocating filling-tube passing through said vessel having its lower end adapted to be protruded into the receptacle to be filled, in combination with a motor supported by said apparatus and connected with the other end of said tube exterior of the vessel to reciprocate the same.

11. In a decanting apparatus, a vessel for containing liquid and a gas under pressure, a reciprocating filling-tube therein provided with a discharge-conduit and an escape-conduit having upper openings respectively within the vessel and lower openings adapted to be inserted into the receptacle to be filled, in combination with operating means exterior of the vessel for reciprocating said upper discharge-conduit opening alternately into the gas-space and into the liquid.

12. In a decanting apparatus, a vessel for containing liquid and a gas, a filling-tube mounted to reciprocate therein and to de-

bouch into the receptacle to be filled, in combination with upper extensions from said tubes passing to the exterior of the vessel and means for reciprocating said extensions comprising a cylinder superposed upon said vessel and having a piston connected with said extensions.

13. In a decanting apparatus, a vessel containing the liquid to be decanted and a plurality of filling-tubes mounted to slide therein and to extend to the exterior thereof into the receptacles to be filled, extensions of said tubes to the exterior of the vessel, the said tubes and their extensions being divided into two sets, in combination with means for alternately reciprocating said sets comprising two cylinders intercommunicating through a confined passage at their outer ends, a piston in each cylinder connected respectively with the tube or tubes of said sets, and means for admitting fluid-pressure to the inner end of either cylinder.

14. In a decanting apparatus, a hollow filling-head having a tubular nozzle portion adapted to be inserted into the mouth of the receptacle to be filled, and means for admitting fluid-pressure into said head to expand the same against the mouth of the receptacle.

15. In a decanting apparatus, a hollow elastic filling-head constituting a cushion and a tubular elastic-nozzle projection thereon adapted to be received within the mouth of the receptacle to be filled and means for admitting fluid-pressure into said cushion and nozzle to expand the same against the receptacle.

16. In a decanting apparatus, a hollow elastic filling-head constituting a cushion having a tubular elastic nozzle thereon adapted to be received within the mouth of its receptacle to be filled, means for moving said receptacle-mouth over the projection and pressing the same relatively against said cushion, and a source of fluid-pressure for inflating said cushion.

17. In a decanting apparatus, a hollow elastic filling-head constituting a cushion and having an aperture adapted to communicate with the interior of the receptacle to be filled, in combination with means for moving said receptacle relatively into contact with said cushion and means for admitting fluid-pressure thereto to expand the same against the receptacle.

18. In a decanting apparatus, a bottle-supporting platen, and a filling-nozzle, in combination with means for producing movement of said platen relatively toward said nozzle and a pipe provided with a valve mechanism adapted to be operated by such movement to admit gas under pressure through said pipe into the interior of said nozzle.

19. In a decanting apparatus, a bottle-supporting platen and a filling mechanism adapt-

ed to be coupled with the bottle on said platen, in combination with means for moving said platen relatively toward the filling mechanism to effect coupling of the bottle, and valve mechanism actuated by said means for admitting gas under pressure to said bottle.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL SELLENSCHEIDT.

Witnesses:

HANS HEIMANN,
WOLDEMAR HAUPT.