J. H. CHAMP.

BOTTLE FILLING MACHINE.

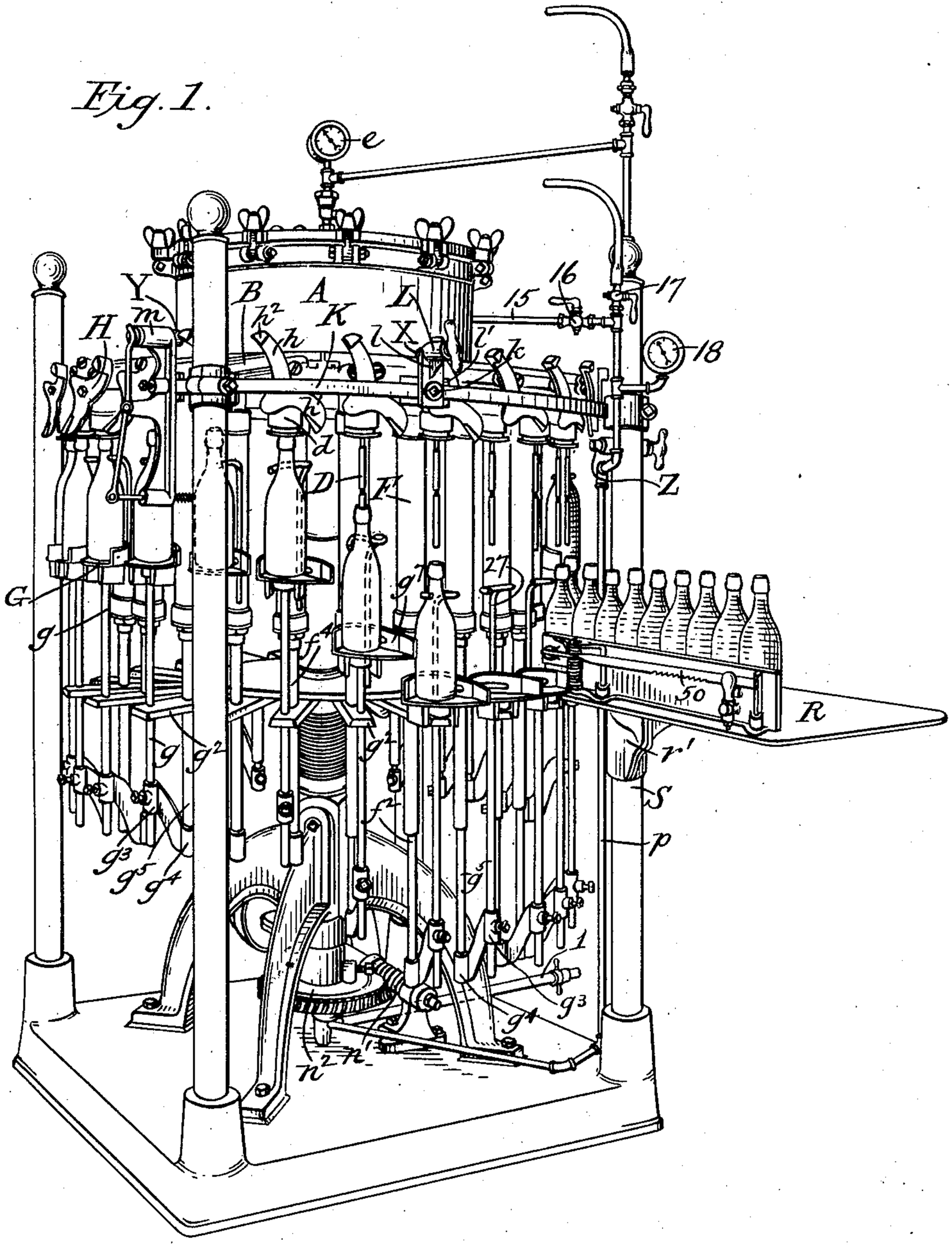
APPLICATION FILED JULY 25, 1906.

956,286.

Patented Apr. 26, 1910.

11 SHEETS—SHEET 1.

Fig. 1.



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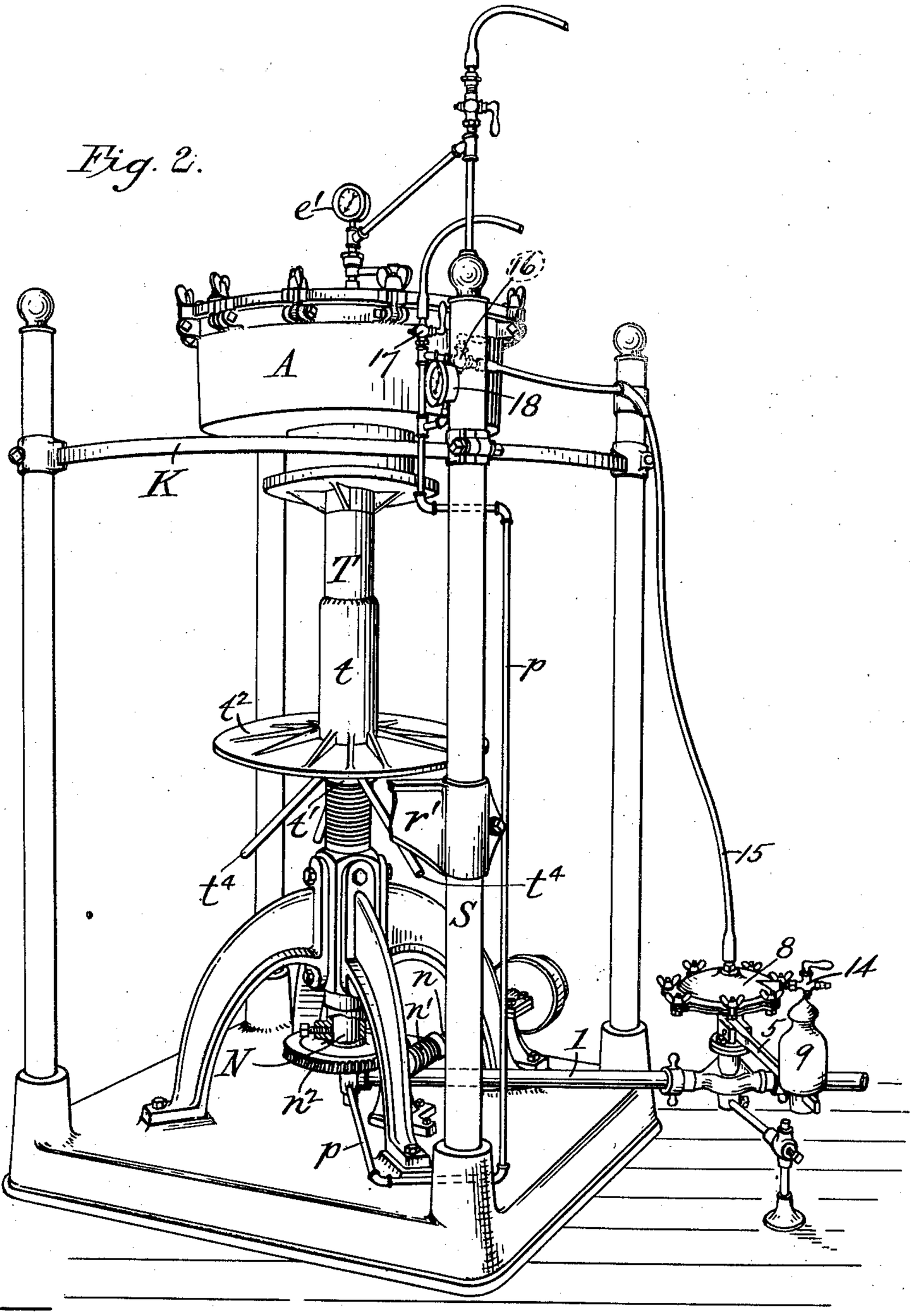
11 SHEETS—SHEET 2.

Fig. 2.



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11 SHEETS—SHEET 3.

Fig. 3.

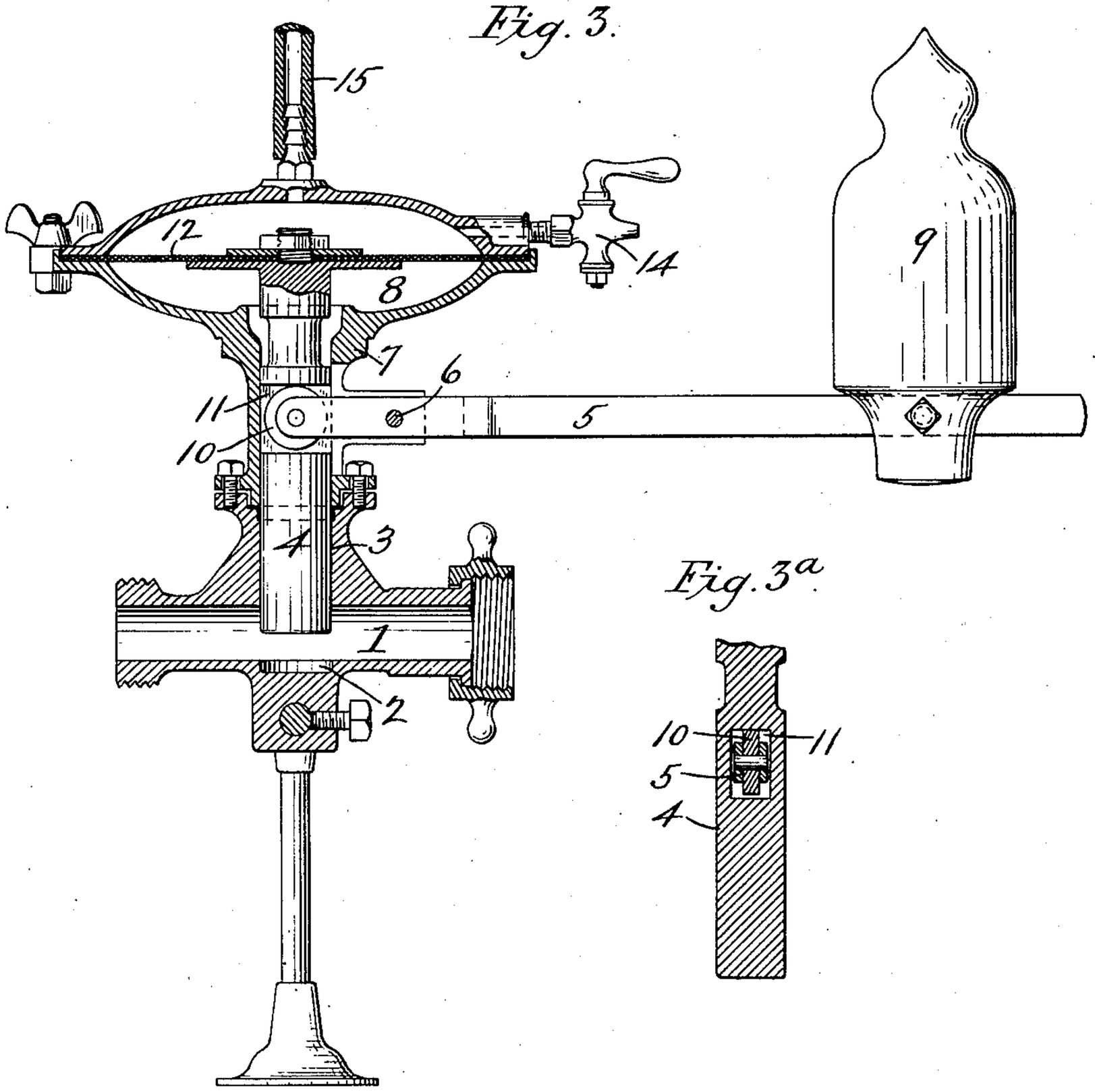

Fig. 3a.

Witnesses:

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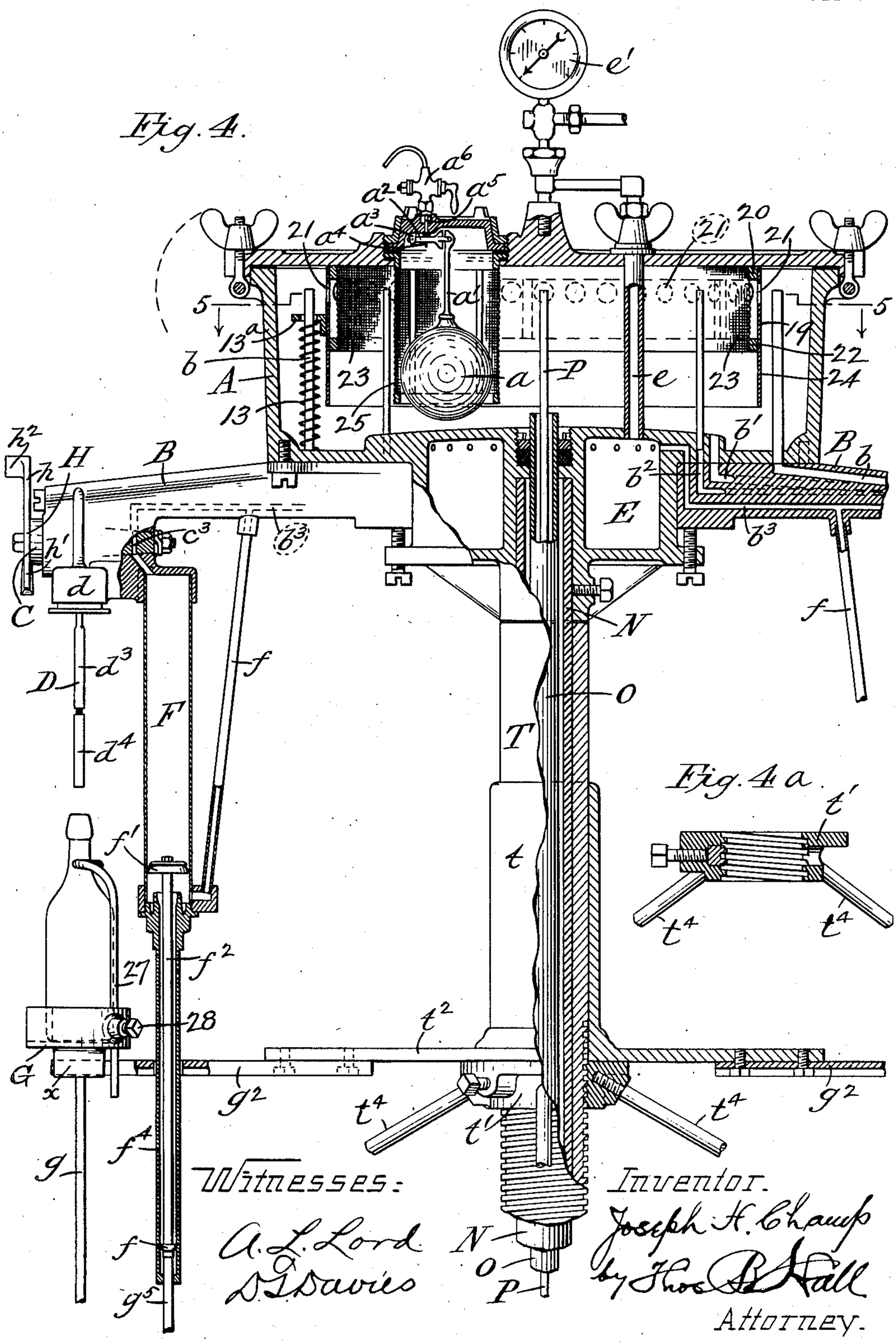
Fig. 4.



Witnesses:

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Fig. 4a.

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11 SHEETS—SHEET 5.

Fig. 5.

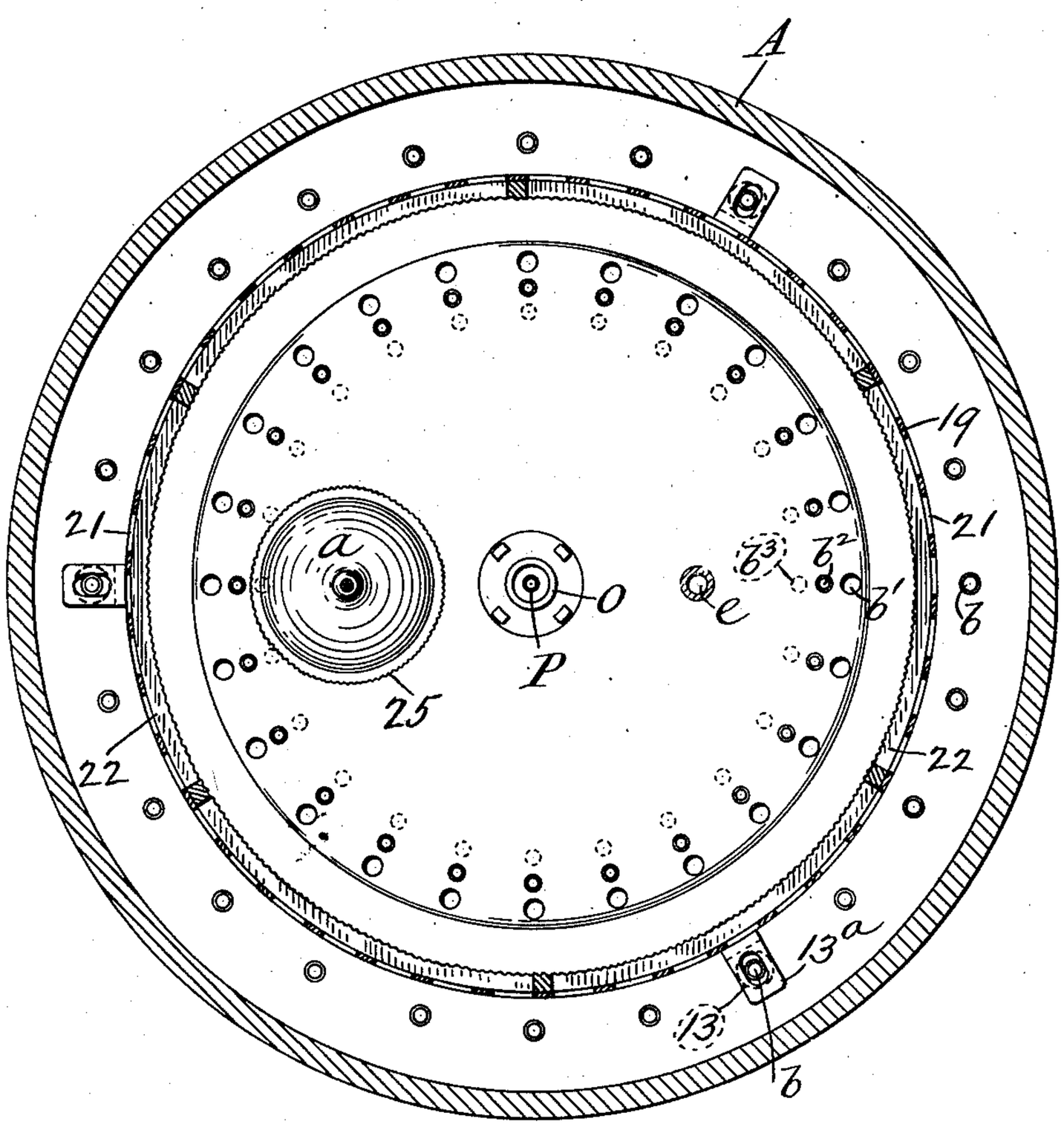

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Fig. 6.

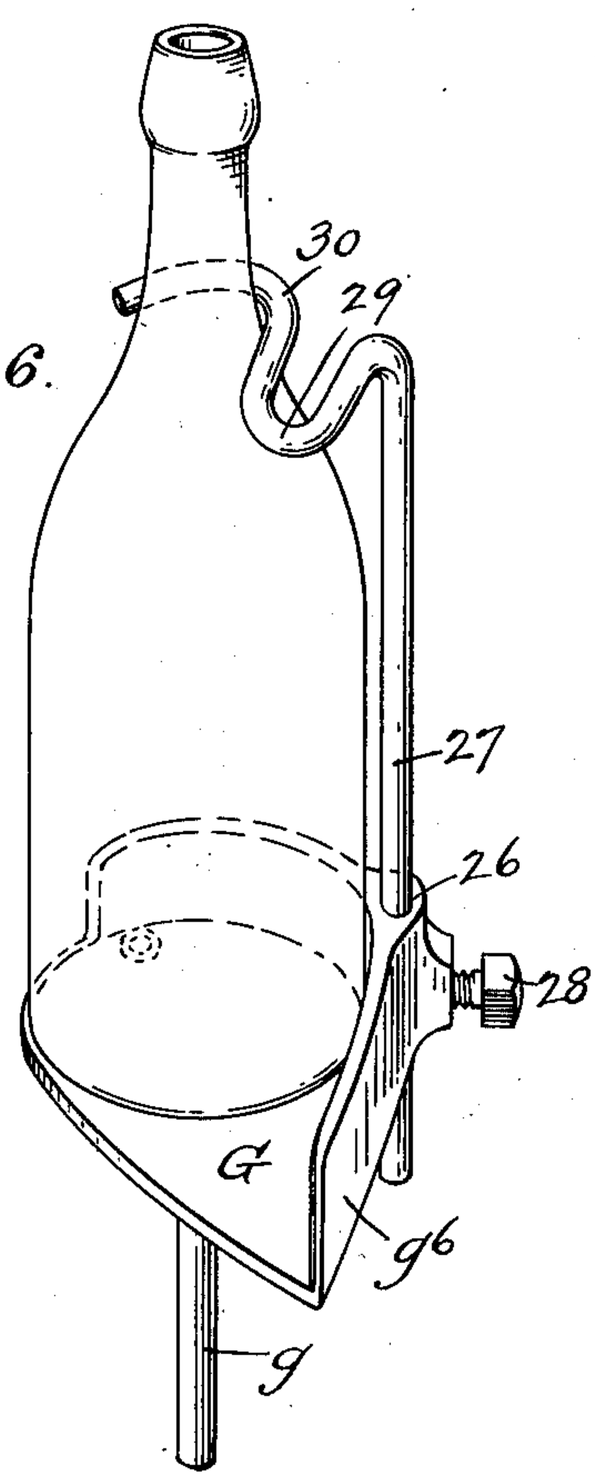


Fig. 7.

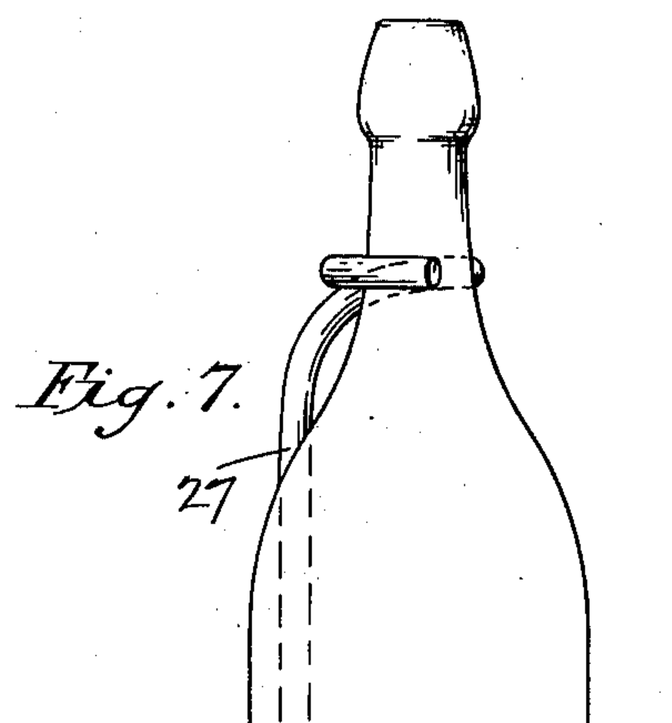
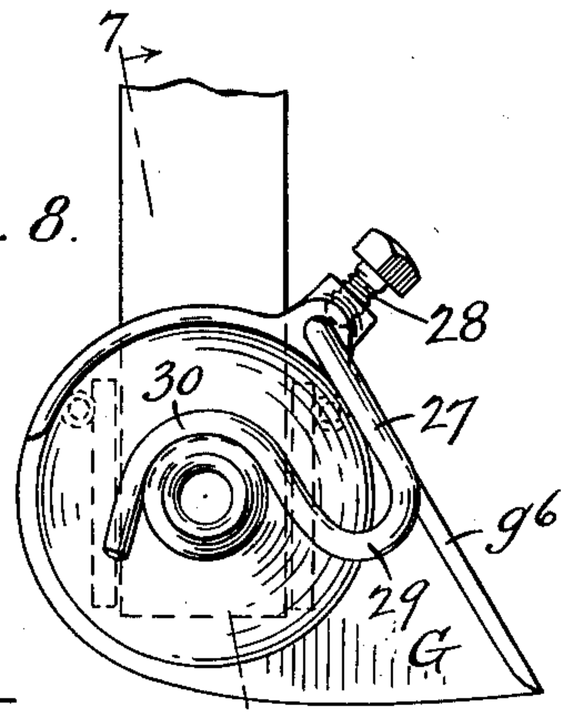


Fig. 8.



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11 SHEETS—SHEET 7.

Fig. 9.

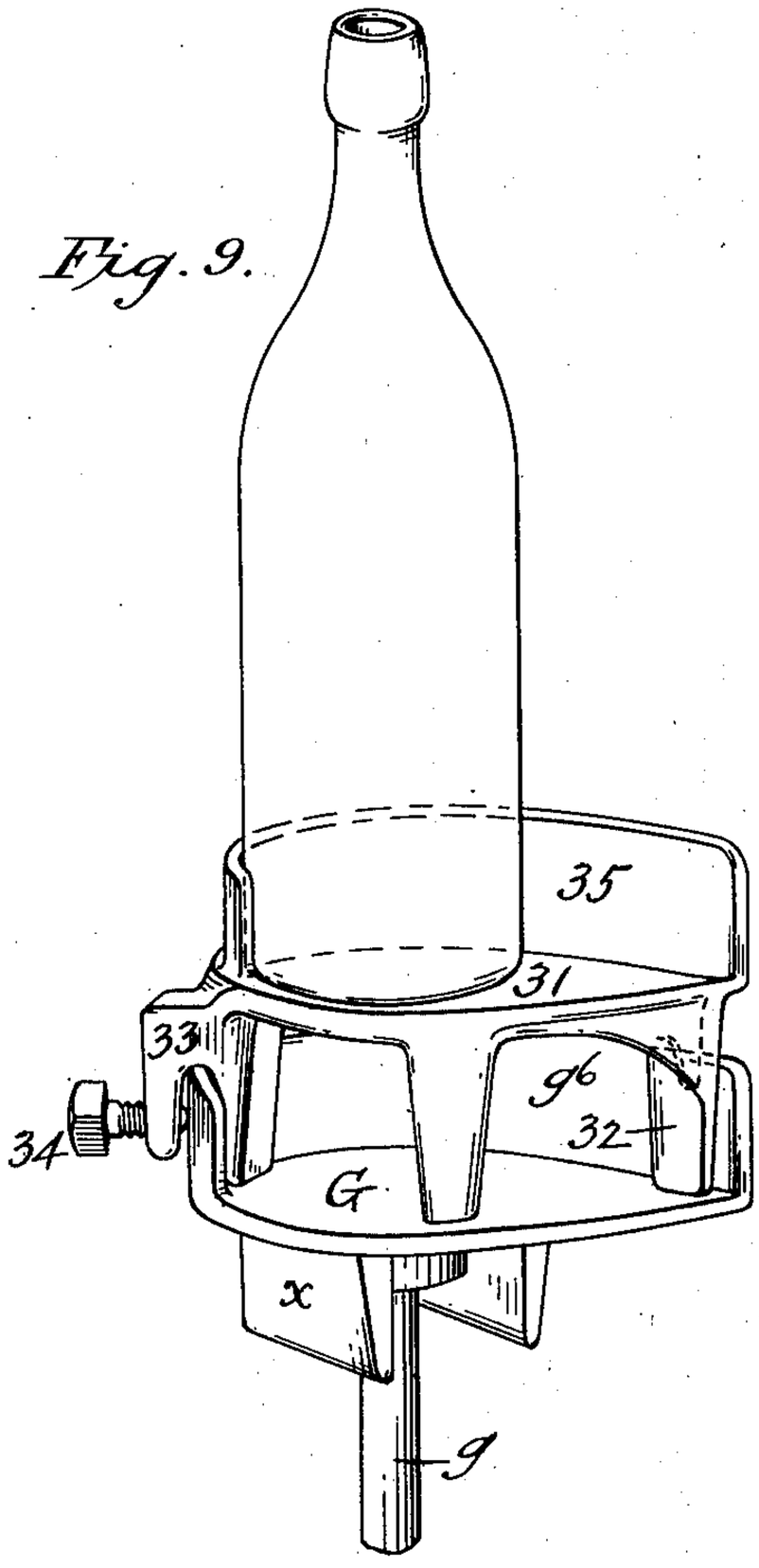
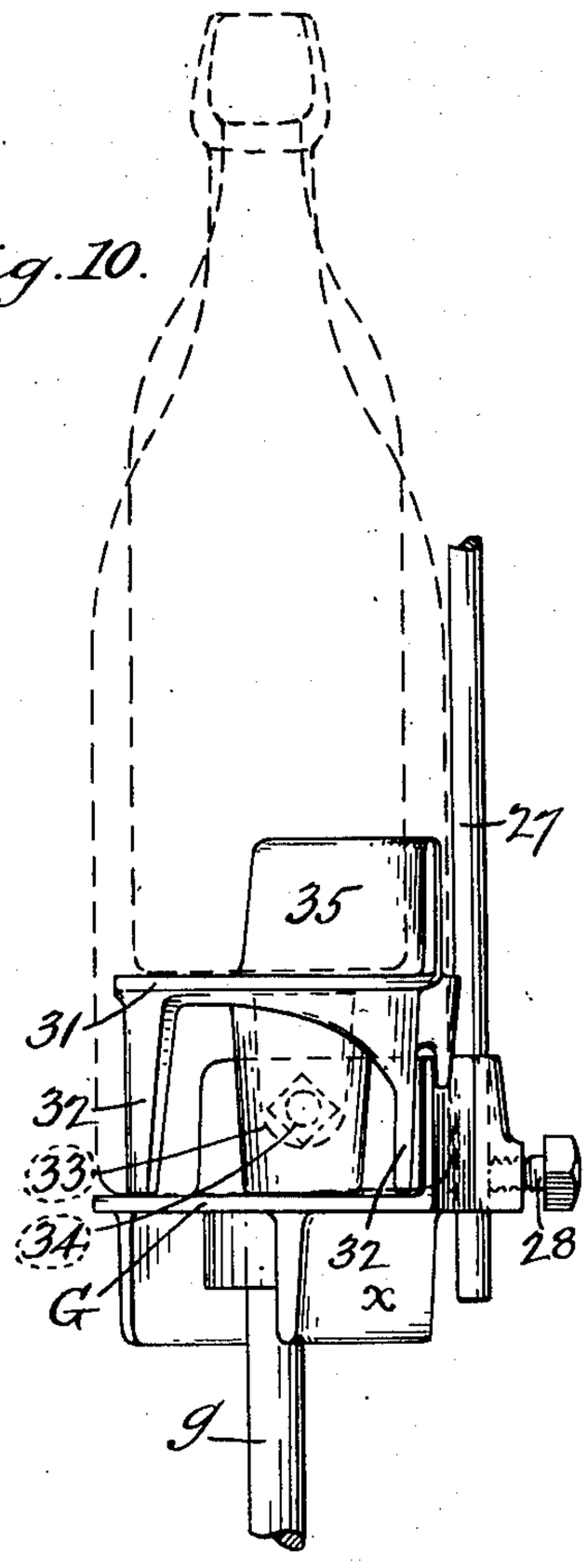


Fig. 10.



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11 SHEETS—SHEET 8.

Fig. 11.

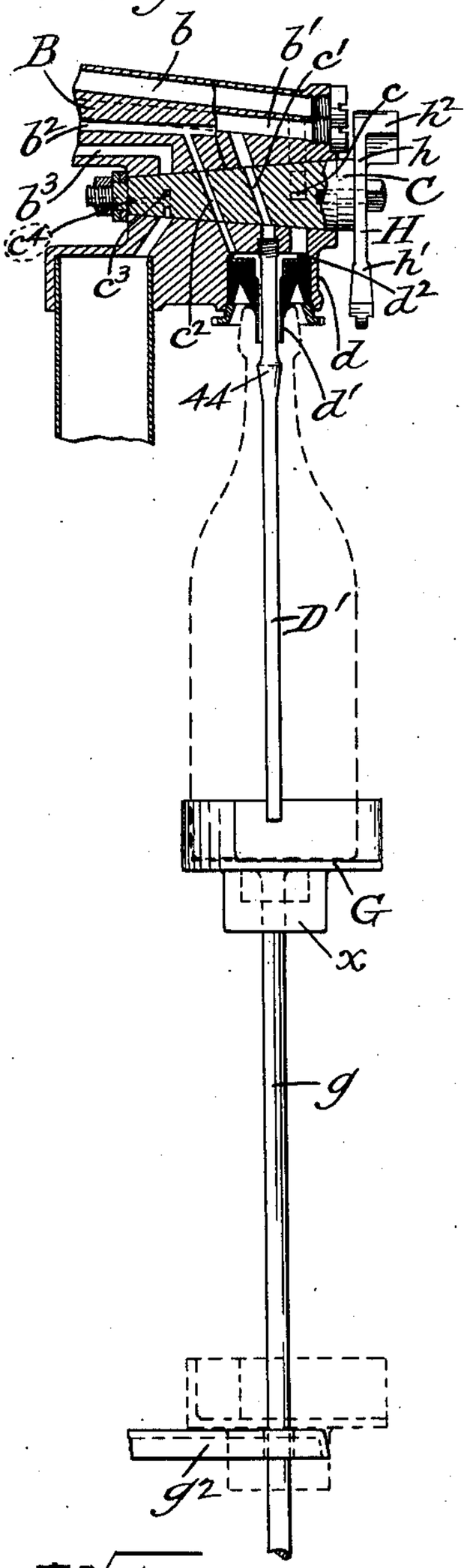


Fig. 12.

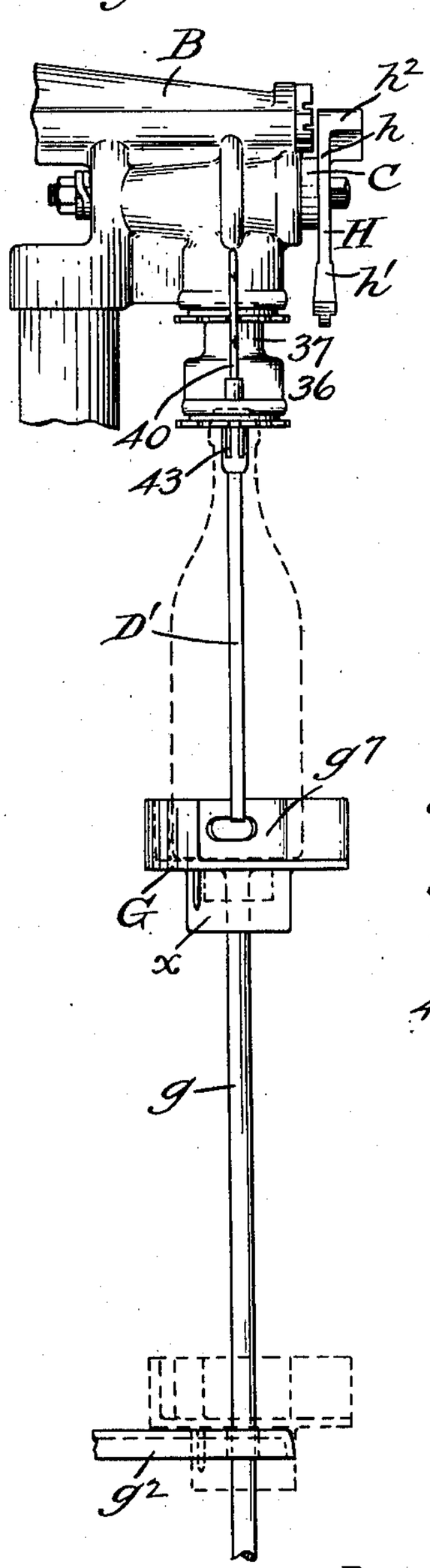


Fig. 11ª.

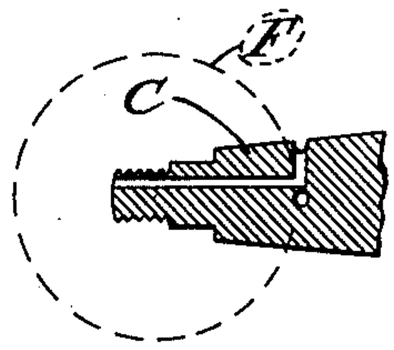
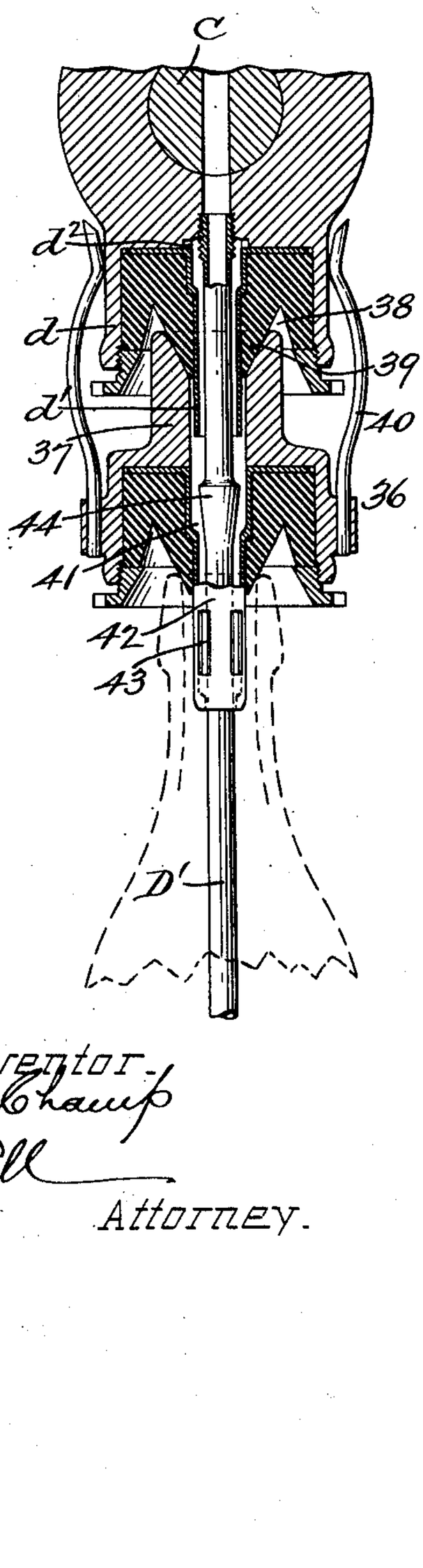


Fig. 13.



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956,286. **Patented Apr. 26, 1910.**

11 SHEETS—SHEET 9.

Fig. 14.

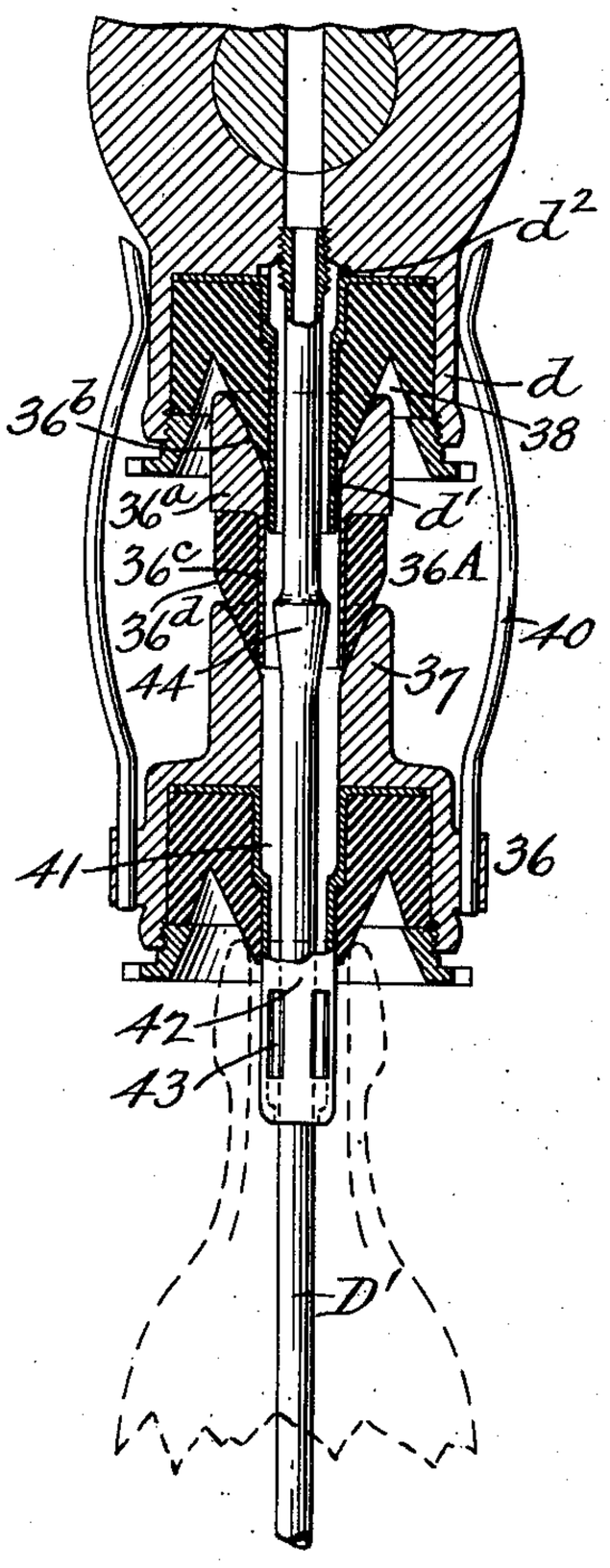


Fig. 15.

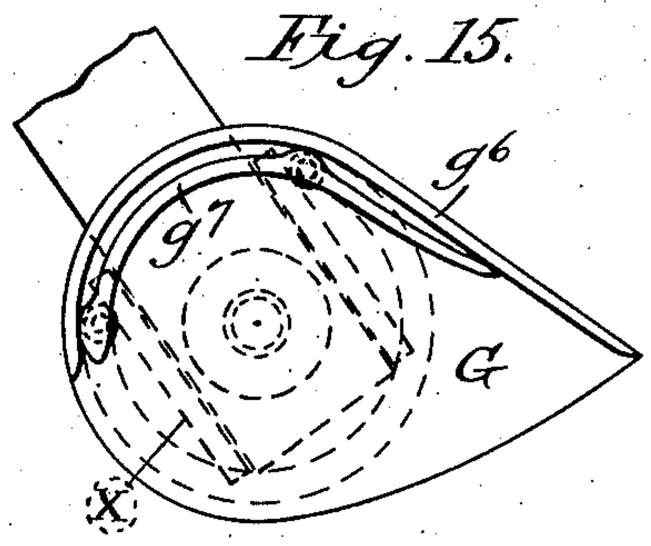
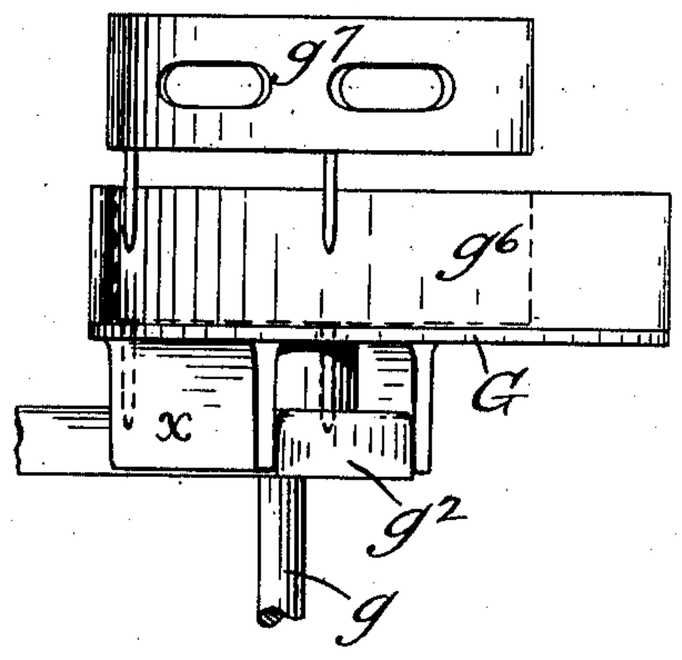


Fig. 16.



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11 SHEETS—SHEET 10.

Fig. 17.

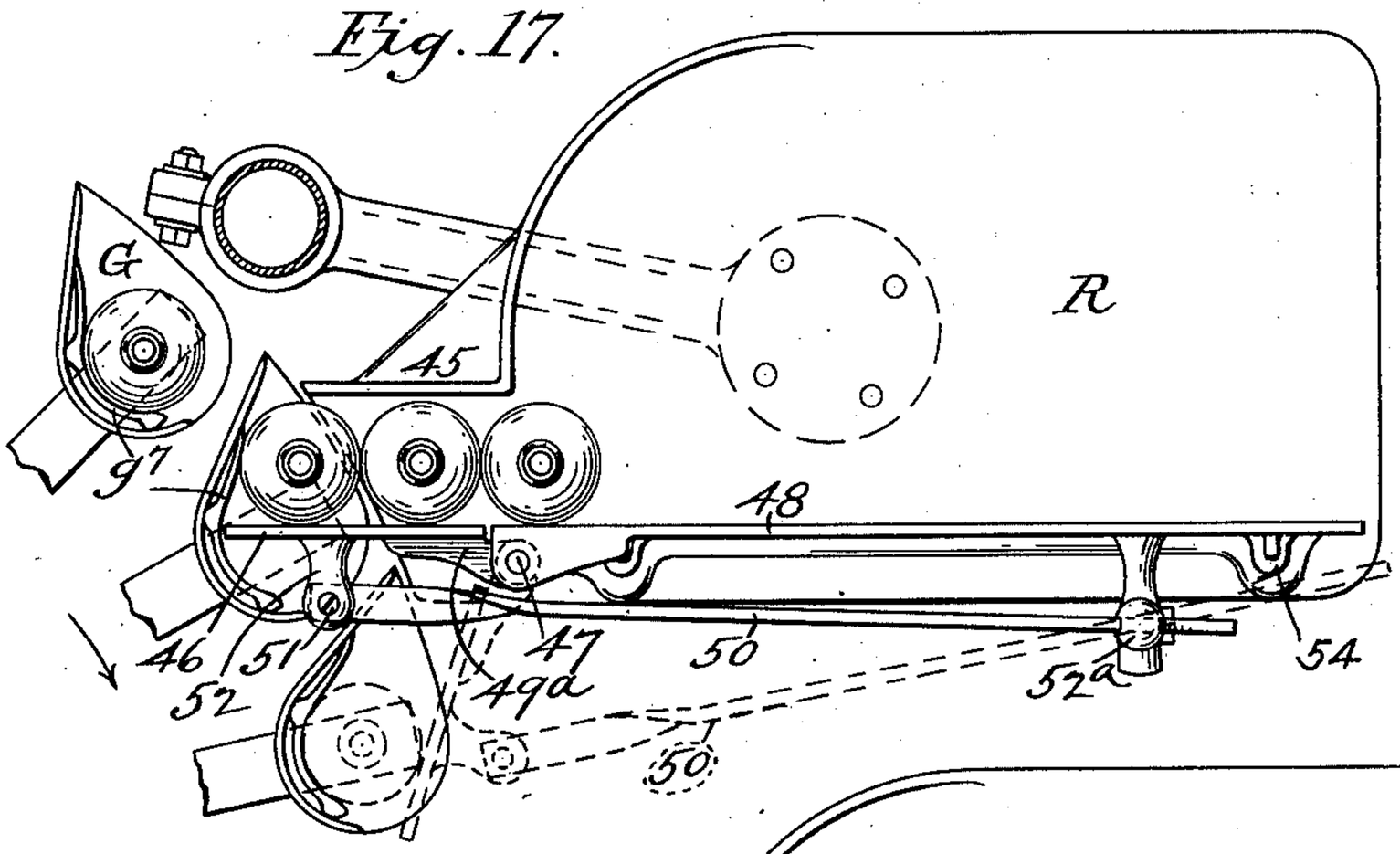


Fig. 18.

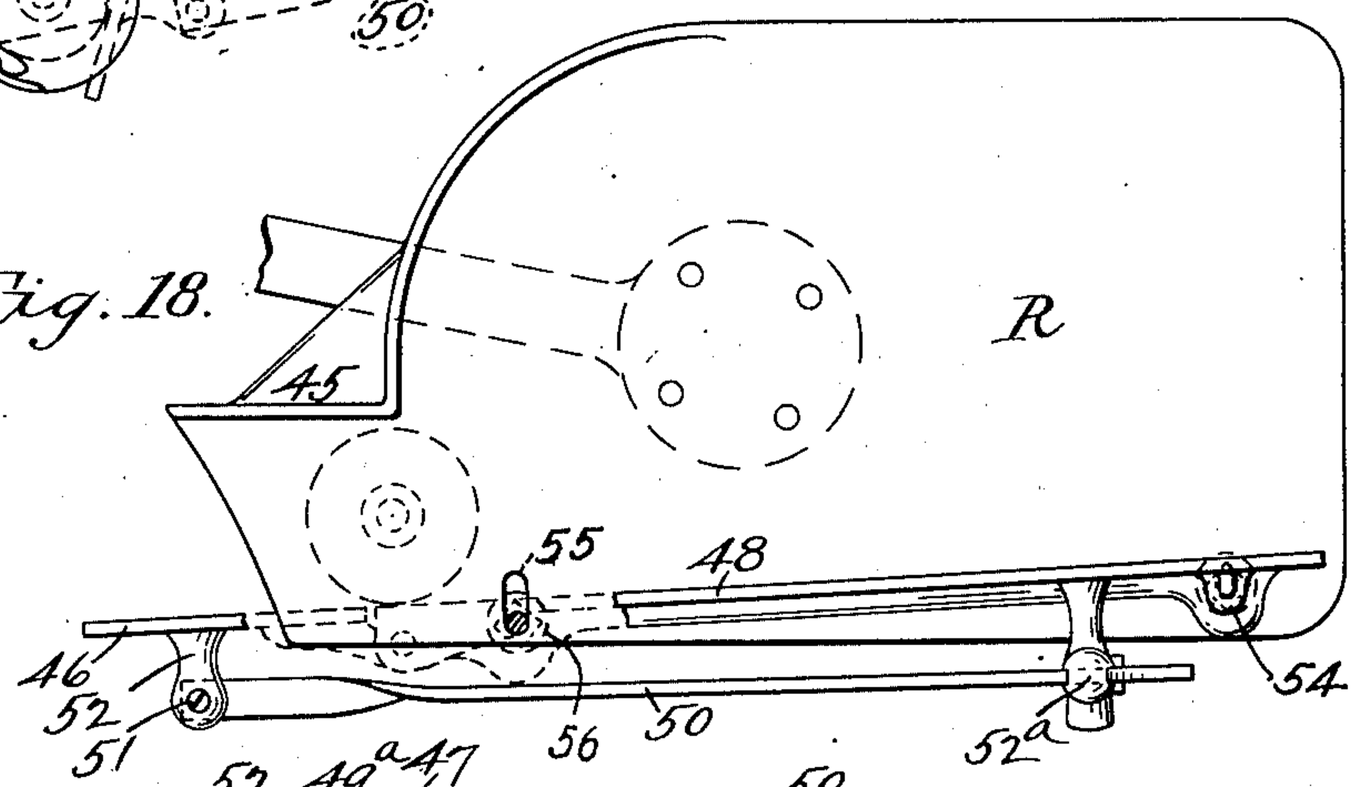


Fig. 19.

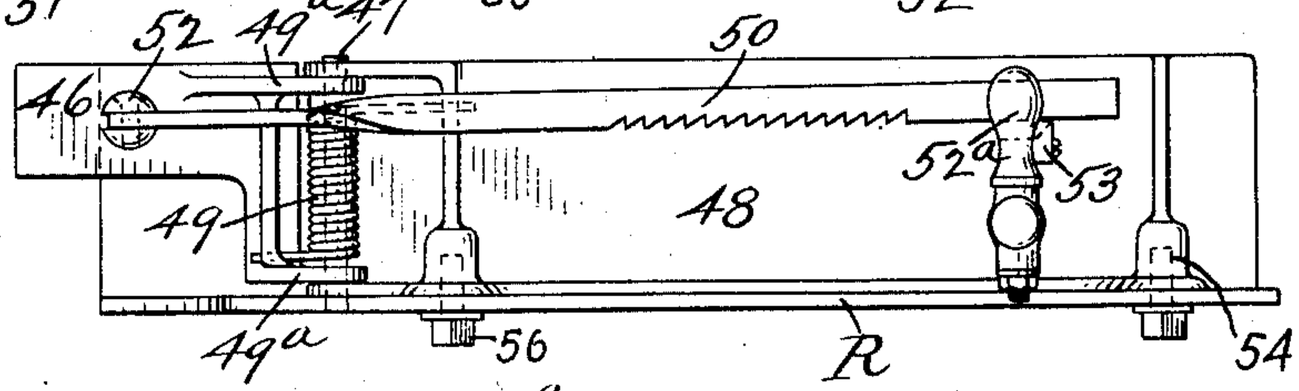
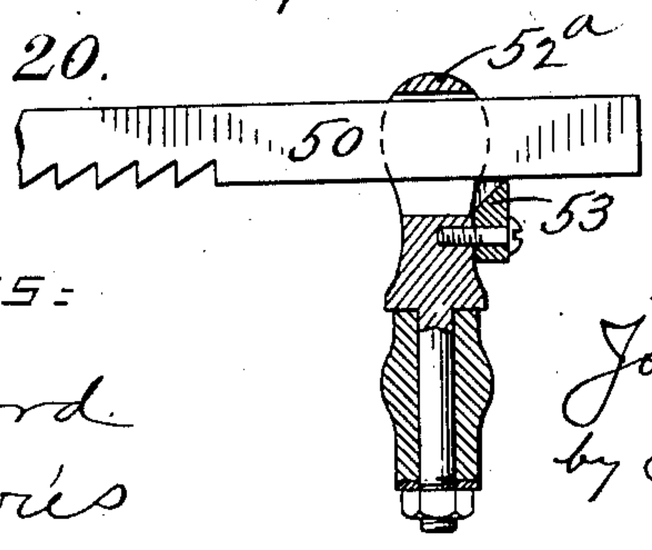


Fig. 20.



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11 SHEETS—SHEET 11.

Fig. 22.

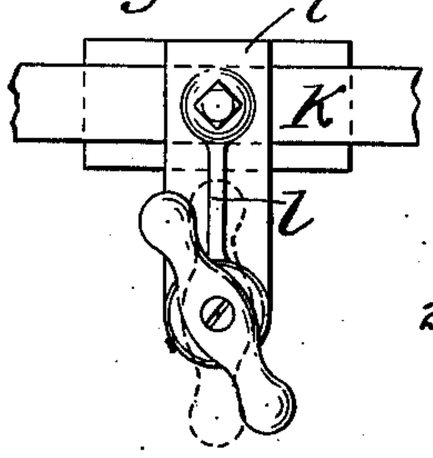


Fig. 21.

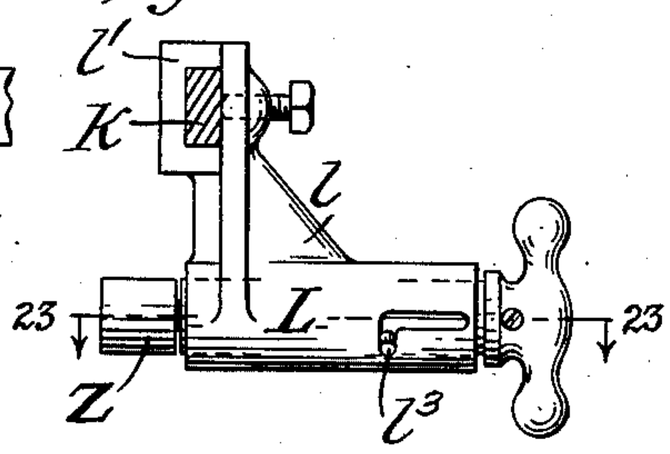


Fig. 23.

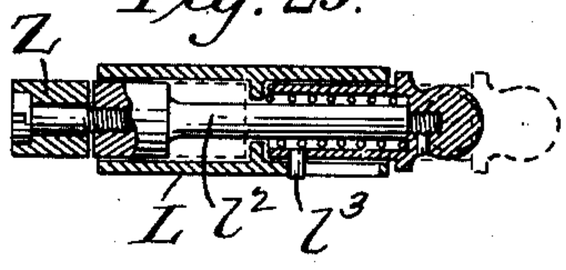


Fig. 25.

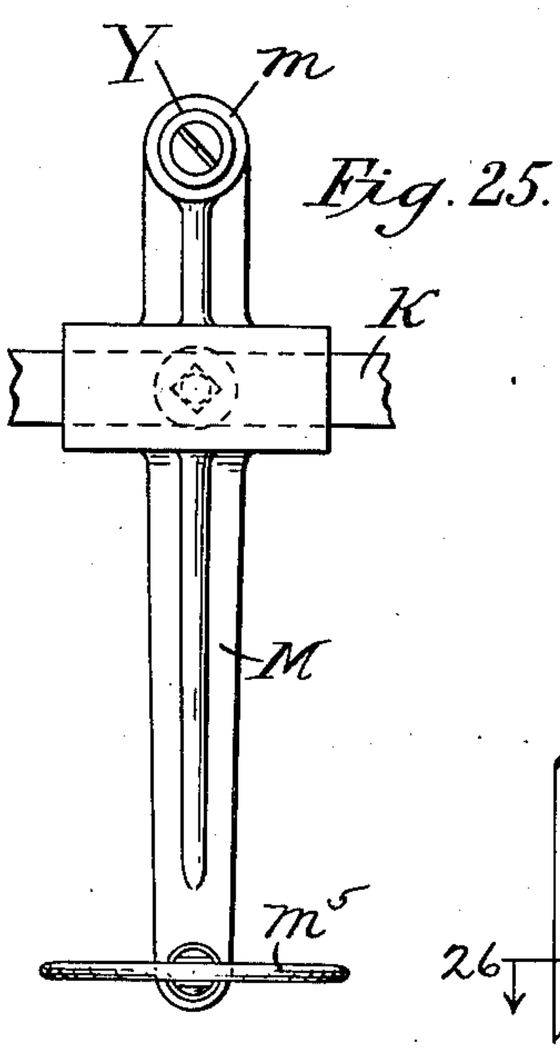


Fig. 24.

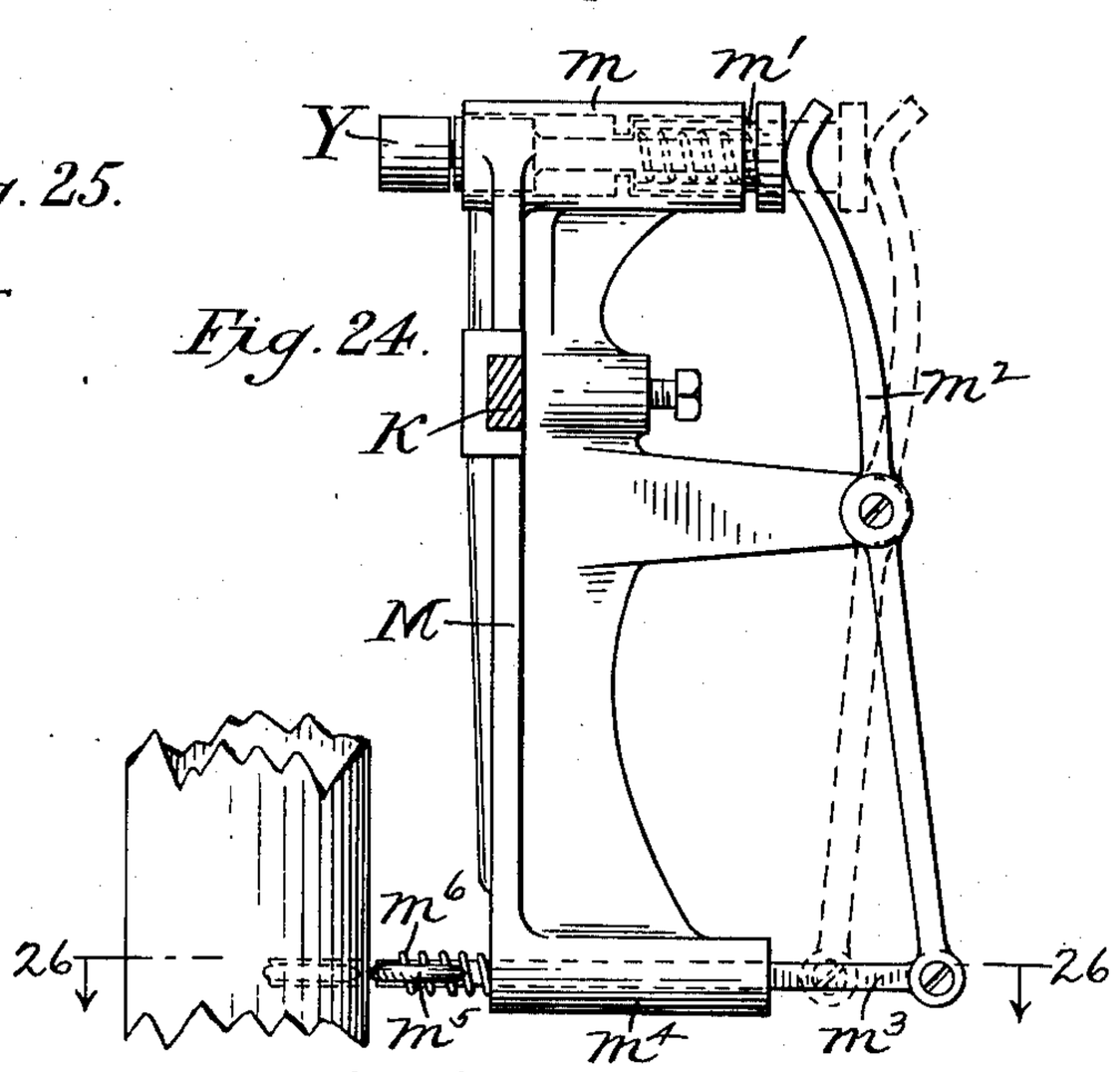
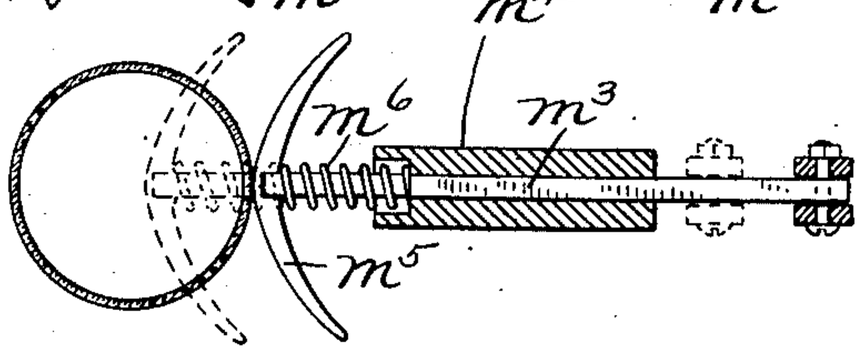


Fig. 26.



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UNITED STATES PATENT OFFICE.

JOSEPH H. CHAMP, OF CLEVELAND, OHIO.

BOTTLE-FILLING MACHINE.

956,286. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed July 25, 1906. Serial No. 327,618.

To all whom it may concern:

Be it known that I, JOSEPH H. CHAMP, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Bottle-Filling Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The object of the invention is to provide an improved machine for filling bottles or other analogous vessels; and such invention is particularly intended for the automatic filling of bottles with beer under pressure.

The invention consists of the means hereinafter described, and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings: Figure 1 is a front perspective of the machine, with omission of certain construction which might confuse the construction especially sought to be shown in this view. Fig. 2 is a perspective of the machine, from a point of view different from that of the last, omitting certain construction shown in such last view, and showing the means for automatic regulation of the beer supply. Fig. 3 is a detail, partly in vertical sectional elevation and partly in side elevation, of the automatic regulating means for the beer supply. Fig. 3ª is a detail, showing a portion of the plunger valve, in vertical section at right angles to the vertical sectional view of said valve in the last figure. Fig. 4 is a partly side elevation and partly vertical section, of certain construction of the machine. Fig. 4ª is a detail view, in vertical section of the collar that adjusts the bearing bars of the bottle rests. Fig. 5 is a detail on line 5—5 of Fig. 4, showing a top horizontal section of the beer tank. Fig. 6 is a detail perspective, of a bottle rest provided with a bottle neck fitting device. Fig. 7 is a vertical sectional elevation of a bottle rest and its supporting stem, on line 7—7 of Fig. 8. Fig. 8 is a top plan of Fig. 7. Fig. 9 is a detail, in perspective of a bottle rest provided with a supplemental bottle rest. Fig. 10 is a detail, in side elevation of the construction shown in the last view, together with a portion of the bottle neck fitting device shown in the three views immediately preceding such last view. Fig. 11 is a detail, mainly in vertical longitudinal section of the outer end portion of one of the horizontal radial arms projecting from the lower portion of the beer tank, the members being shown in their third and last position caused by engagement of the valve rock device with the second roller. Fig. 11ª is a detail in horizontal longitudinal section of the rear end of the rotary plug valve. Fig. 12 is a side elevation of the construction shown in Fig. 11. Fig. 13 is a detail mainly in vertical transverse sectional elevation, of a bottle mouth piece provided with a supplemental mouth piece. Fig. 14 is a detail view, mainly central vertical section of members used with the filling of splits. Fig. 15 is a detail view in top plan of a permanent bottle rest equipped with a diametrical reducer. Fig. 16 is a detail view, in side elevation of members shown in the last view,—the diametrical reducer being lifted up. Fig. 17 is a detail, in top plan, of the bottle receiving table, and accompanying bottle rests; the table members being shown in position for pint bottles. Fig. 18 is a top plan of the same table with certain portion broken away, and showing the members in position for quart bottles. Fig. 19 is a side elevation of the same table and its yielding guide provided with locking device. Fig. 20 is a detail of certain portion of said locking device. Fig. 21 is a detail view in side elevation of a roller, alike constructed for either the first or the third roller, such view showing the roller depending from its bearing bar, as the third roller depends. Fig. 22 is an end elevation of Fig. 21. Fig. 23 is a horizontal longitudinal section on line 23—23 of Fig. 21. Fig. 24 is a detail view, in side elevation of the second roller and its connected mechanism. Fig. 25 is a detail view, in front elevation of Fig. 24. Fig. 26 is a detail view, in longitudinal horizontal section, on line 26—26 of Fig. 24.

The form of the machine shown in the drawings is adapted to operate with an indefinite number of bottles simultaneously. Detail description will be given of the construction and operation of the invention as embodied in means thereof for filling a single bottle with beer under pressure.

The beer supply pipe has its horizontal lower portion 1 formed with a valve seat 2 in its lower wall, and with a vertical valve way 3 in its upper wall, in vertical line with said valve seat. An upright plunger valve 4 works freely in said valve way and is adapted to control passage of the beer through said beer pipe portion 1. A lever 5 is horizontally pivoted at 6 to a casing 7 depending from the central lower portion of a diaphragm chamber 8; such casing being detachably secured to the upper wall of said beer way portion 1, centrally above said valve way 3. The outer and longer arm of said lever is provided with a weight 9, adjustable lengthwise of such lever. The inner and shorter arm of said lever is provided with a loose roller 10 horizontally pivoted thereto, and adapted to work freely up and down within recess 11 formed in said plunger valve 4. A horizontal diaphragm 12 is fitted centrally within said diaphragm chamber, and is tightly joined to the sides of the latter so as to prevent fluid communication between the upper and lower sides of the diaphragm. Such diaphragm is centrally fastened to said plunger valve 4. The portion of said diaphragm chamber above the diaphragm is provided with a cock 14. The central upper portion of such diaphragm chamber is in constant communication with the lower extremity of air tube 15; the upper extremity of such air tube being provided with a cock 16, and thereafter communicating with the air supply tube p at a point below the latter's provision with a cock 17.

That portion of the air tube p above cock 17, is to be connected with a source of air or other suitable fluid under compression. That portion of said air tube p which is below communication of tube 15 with the latter, is provided with a gage 18, and thereafter extends downwardly. At the bottom of the machine, such air tube p communicates with tube P.

The circular beer tank A, centrally located at the top of the machine, has the series of rigid radial arms B, all like each other, rigidly secured to, and projecting in a general horizontal direction at equi-distant points from, the lower portion of said tank. Each such arm has the four independent fluid ways: the compressed air-inlet-way b, the beer-way b', the vent-way b^2, the actuating-fluid-way b^3. Each one of said four ways is divided into two transverse parts, an upper and a lower part, having the horizontal plug C located between such two parts. The compressed air-inlet-way b has its two transverse parts adapted to communicate with each other by intermediate registration of channel c formed in plug C. The beer-way b' has its two transverse parts adapted to communicate with each other by intermediate registration of channel c' formed in plug C. The vent-way b^2 has its two parts adapted to communicate with each other by intermediate registration of channel c^2 formed in plug C. The actuating fluid way b^3 has its two parts adapted to communicate with each other by intermediate registration of channel c^3 formed in plug C. The formations of the said ways b, b', b^2 are such that the two transverse parts of air-inlet-way b register with channel c and complete the operation resulting from such registration and pass out from said registration,—all before the two transverse parts of vent-way b^2 register with channel c^2, and also all before the two transverse parts of beer-way b' register with channel c'; whereby the bottle is properly charged with air having the same pressure as the beer, before beer communication to the bottle is had and before vent is given to the bottle. Said compressed air-inlet-way b and said vent-way b^2 each has the inner end of its upper transverse part in constant communication with the upper portion of the beer tank A. Said beer-way b' has the inner end of its upper transverse part in constant communication with the lower portion of such tank.

Within the beer tank A (Figs. 4 and 5) the upper portions of the air-charging-ways b and of the vent-ways b^2 are formed in two concentric series, projecting upwardly from the bottom of the tank; the outer series being for charging bottles with compressed air, the inner series being for venting the bottles while being filled with beer. A circular partition 19 is located between such two series of fluid ways, within the tank; and has its upper edge bearing closely and yet freely against the top of such tank. The upper portion of such partition is provided with an upper horizontal band 20. The horizontal portion of the partition lower than said band is formed with air passages 21, passing horizontally entirely through such partition. The middle height portion of the partition is provided with a lower horizontal band 22. Such upper and lower bands project toward the series of vent-ways b^2, and to them are respectively attached the upper and lower portions of a wire screen 23. Such screen has its upper edge bearing closely and yet freely against the top of said tank; a portion of the body of such screen being located in the same horizontal plane with said air passages 21. Said partition 19 has a close-bodied circular wall 24 depending lower than said screen and said lower band 22. The said close and yet free bearing of the upper edges of said partition 19 and screen 23 is effected in the following manner; spiral springs 13 are coiled respectively around certain ones of the air pipes b; the lower ends of such springs having free bearing upon the bottom of the beer

tank while the upper ends of such springs have free bearing respectively against the under sides of ears 13^a fastened to the outer side of said partition 19. The float *a* of the air escape device with which the beer tank is provided, is located within the space inclosed by said partition 19. Within such inclosed space, said float is horizontally surrounded by a circular screen 25, which depends from the tank top and horizontally surrounds the path of vertical play of said float. The lower portion of such screen 25 is substantially in the same horizontal plane with the lower portion of said wall 24. Said actuating fluid way b^3 has the inner end of its upper transverse part in constant communication with the annular actuating-fluid reservoir E, located centrally below said beer tank. Compressed actuating fluid is supplied to said reservoir by pipe *e* communicating with the reservoir top; such pipe being provided with gage *e'* and adapted to be connected to a suitable feed device. At a point between said reservoir E and said plug C, said actuating fluid way b^3 has constant communication with the fluid-way *f* constantly communicating with the lower portion of the vertical cylinder F depending from the arm B, below the lower transverse part of such way b^3. The lower end of the lower transverse part of way b^3 has constant communication with the upper end of said cylinder F. The waste way c^4, in the inner end of the plug C, is adapted to communicate with said lower transverse part of way b^3 when such plug is in certain rotary positions, and to be closed from such communication when said plug is in certain other rotary positions. Said cylinder F has piston *f'* working therein, always between the communications respectively of the way *f* and the lower transverse part of way b^3 with the opposite ends of said cylinder. The lower face of such piston is subjected constantly to the pressure of the actuating fluid in reservoir E. The upper face of such piston is subjected to the pressure of the fluid within the said reservoir E, when plug C is turned so as to cause the two transverse parts of way b^3 to communicate with each other by channel c^3; and is subject to atmospheric pressure when plug C is turned so as to cause the lower transverse part of way b^3 to be in communication with the open air by waste way c^4. Said piston *f'* is mounted on the upper end of piston rod f^2, whose lower end is provided with piston f^3 of materially less working diameter than piston *f'*. Such piston f^3 works within cylinder f^4, depending centrally down from cylinder F and of materially less diameter than such latter cylinder. The lower face of said piston f^3 is constantly subject to atmospheric pressure, piston rod g^5 fitting but loosely in the bearing therefor provided in the lower end of cylinder f^4. The upper face of said piston f^3 is constantly subject to the pressure of the actuating fluid in reservoir E, by the constantly open communication between the lower end of cylinder F and the upper end of cylinder f^4.

Each bottle rest G is rigidly and centrally mounted on the upper end of a depending stem *g*, passing freely through a hole *g'* in the outer end of the radial horizontal bearing bar g^2. The lower end portion of such stem being adjustably secured in the sleeve g^3 rigidly connected to the sleeve g^4, the latter adapted to be secured in vertical adjustment on rod g^5 depending from the piston f^3, and longitudinally sliding through the open lower end of cylinder f^4. Each said rest G has its under-side provided with two depending lips *x*, respectively located free from and to opposite sides of stem *g*, in the line of horizontal travel of such rest; such lips having a horizontal space between them equal to the width of said horizontal bar g^2, and adapted to have lateral bearing respectively against the front and rear edges of such bar. Each said rest G (Fig. 6) has its outwardly projecting flange g^6 provided with a vertical aperture 26, within which is freely fitted a vertical rod 27. A set screw 28 is threaded in the rear exterior wall of said aperture 26, and has end bearing against said rod 27, so as to secure the latter in vertical adjustment. Such rod has its upper portion provided with a horizontal double loop formation; the inner loop 29 closed toward the operator, while the outer loop 30 is open toward the operator. Such outer loop is adapted to permit the lateral introduction of the neck of a bottle therein as the latter is laterally placed upon the bottle rest, thereby insuring the alinement of the bottle mouth with its corresponding mouth piece, as the bottle is placed on its appropriate bottle rest with its neck fitting within said outer open loop 30. Each bottle rest G (Fig. 7) is formed on its stem *g* at other than a right angle thereto, thereby aiding in causing bottles having uneven bottoms to be placed in proper position on the bottle rest. Each said bottle-bottom rest having its rear portion formed inclined downwardly and rearwardly, relatively to its said stem; the extreme degree of such inclination being adjacent to said upwardly projecting rear flange g^6 of the bottle rest.

I show several different modes for adapting the machine for filling bottles of different sizes such as quart bottles and pint bottles. Mode number one employs the sectional beer filling tube D, the diametrical reducer g^7 and the vertically adjustable bars g^2, as hereinafter described. Mode number two employs the sectional beer filling tube D and the supplemental bottle rest 31, as hereinafter described. Mode number three em-

ploys the non-sectional beer filling tube D′ and the supplemental mouth piece 36 together with diametrical reducer g^7, as hereinafter described. Beer filling tube D or D′ is connected to and depends from the discharge end of the lower transverse part of beer-way b'; passing freely down through permanent mouth piece d, leaving a free annular space in the central tube d' of such mouth piece; the latter having upper chamber d^2 providing constant communication between the discharge ends of the lower transverse parts of air inlet way b and ventway b^2 on the one hand, and said tube d' on the other hand. The beer filling tube D (Figs. 1 and 4) is formed with an upper section d^3, and with a lower section d^4, having their connecting ends screw-threaded together. Such lower section being a long section when the tube D is to be used for filling long bottles such as quart bottles. Such lower section being a short section when the tube D is to be used for filling short bottles such as pint bottles. The non-sectional beer filling tube D′, (Figs. 11–13), has its immediate portion below tube d' formed with an annular boss 44, decreasing diametrically in downward extension; said tube being in its further downward extension, formed straight sided and of less diameter than such boss 44.

In adapting the machine for the filling of bottles known as splits, the mouth piece link 36^A is interposed between the permanent mouth piece and the supplemental mouth piece, as shown in Fig. 14. Such mouth piece link consists of the brass head 36^a having its upper face formed with a circular concavity 36^b adapted to receive the rubber gasket of the permanent mouth piece. A metal tube 36^c centrally depends from said head 36^a and connects at its upper portion with the lower portion of said concavity 36^b. A rubber gasket 36^d is fitted about the depending portion of said tube, and has its lower portion shaped to fit the upper face of the supplemental mouth piece 36; while the lower end of said tube 36^c is in line communication with the central vent passage longitudinally through such supplemental mouth piece.

In mode number two of adapting the machine to the filling of small bottles, I provide a small bottle-bottom rest 31 (Figs. 9 and 10) adapted to be detachably fitted upon a small bottle-bottom rest G. Such small rest 31 having depending legs 32, fitting within and laterally bearing against said outwardly projecting rear flange g^6 of the large rest G. Such small rest 31 having a depending side jaw 33, adapted to fit over said flange g^6 and provided with a set screw 34 which has end bearing against the outer side of said flange. Such small rest 31 being provided with an outwardly projecting rear flange 35, which is closer to the line of vertical axis of stem g than is flange g^6 formed on the large rest G. Such flange 35 being adapted to center the small bottle such as a pint bottle, upon its said rest 31 when such bottle is placed thereon with its lower portion bearing against said flange. Claims to the specific structure involved in this second adaptation have been required to be divided out, and so appear in a co-pending application filed May 2, 1908, Serial No. 430,479.

In mode number three of adapting the machine to the filling of small bottles, I provide a supplemental mouth piece 36,—in substitution for said supplemental bottom rest. Such supplemental mouth piece, fitted to the permanent and upper mouth piece, is shown in Figs. 12 and 13. It has a head 37 adapted to fit within the annular wedge shaped recess 38 of the gasket of the permanent upper mouth piece d. The inner wall of such head 37 inclining outwardly, in counter-part to the inverted conical formation 39 depending from the central portion of such gasket. The side wall of such lower mouth piece 36 is provided with outwardly projecting spring clamps 40, which embrace the side wall of said upper mouth piece d and aid in maintaining such lower mouth piece fitted in close communication with said upper mouth piece, while permitting it to be at will detached therefrom. Such lower mouth piece 36 is provided with a passage 41, which receives the tube d' of the upper mouth piece. Depending from said lower mouth piece, in downward extension from such passage 41, is the tube 42. The portion of such tube 42 lower than the gasket of said lower mouth piece, is provided with lateral longitudinal openings 43. The lower portion of such tube 42 decreases diametrically in downward extension from such lateral openings 43; the portion of such tube below said apertures having its side wall of decreasing thickness to its lowest end. Such construction of tube is for lessening liability of the passage being interferred with by reason of the bottle mouth striking the lower end of the tube as the bottle is placed in its filling position. Where the bottle is not only shorter but also of smaller diameter, a diametrical reducer g^7 similar to that used in mode one is employed to facilitate the correct centering of the bottle on the rest G.

The outer end of each valve C is provided with the tripping device H, adapted to be fastened thereto in desired adjusted position so that such valve and its said tripping device may necessarily turn together in all horizontal rocking movements about the longitudinal axis of the valve. Such tripping device H has upper arm h and lower arm h', projecting right angularly from the longi-

tudinal axis of the valve, in substantially opposite directions. Said upper arm h is provided at its upper and free portion with the outwardly projecting horizontal lug h^2. The roller X, located higher than the valve C, is located in the circular path of horizontal movement of said lug h^2, when such roller is in locked position nearest to the vertical center of the machine. The construction of such coöperating members being such that at no time is there any engagement between roller X and said arm h, except as said roller X engages with lug h^2, and thereby rocks said arm h upwardly and rearwardly, so as to operate said valve during the latter's said horizontal travel. Such engagement of lug h^2 with roller X, as hereinafter described, serves in the operation of raising the bottle rest; after which engagement, such upper valve arm passes said roller, by said lug h^2 passing over such roller, during the continued horizontal travel of the valve circularly around the vertical central axis of the machine. Said upper arm h, is, in the further operation of the machine, adapted to engage with roller Y, as hereinafter described; thereby serving in the operation of filling the bottle. Said roller Y being located in the path of circular horizontal travel of said lug h^2, so as to cause engagement between the same, whereby said arm h is caused to rock upwardly and rearwardly, as hereinafter described; after which, said arm passes said roller Y, by said lug h^2 passing under the latter.

The lower arm h' of the valve is adapted to engage with roller Z, as hereinafter described, to close communication between the beer tank and the bottle mouth piece, and also to lower the bottle rest. Such roller Z is located lower than said valve, and in the path of circular horizontal travel of said depending arm h'; and is adapted to engage with the latter so as to rock it upwardly and rearwardly, as hereinafter described. After thus operating said valve, the depending arm h' passes over said roller Z,—all during the said horizontal travel of the valve.

Rollers X and Z have their supporting frames in duplicate of each other; but the frame of roller X projects vertically upward from bar K, while the frame of roller Z depends vertically from such bar. Each such roller frame consists of a horizontal barrel L, having a web l rigidly connecting it with means for fastening same to said bar K. Each roller, X and Z, is adjustably fastened to a stem l^2, slidable in said barrel and having a spring pressed locking device l^3 adapted to maintain the stem outside of said barrel. The unlocking of such spring pressed device l^3 operates to cause the roller to be withdrawn into said barrel.

Roller Y is provided with the frame M adapted to be fastened to the bar K. Such frame has at its upper portion the horizontal barrel m in which slides stem m', carrying said roller Y at its inner end. Such stem is spring pressed so as to maintain said roller within the barrel, except when such spring-pressure is overcome by a bottle on the corresponding bottle rest,—as follows: The outer end of said stem m' is adapted to be engaged in free sliding bearing by the upper arm of vertical rock lever m^2. The lower arm of such lever is pivoted to the outer end of horizontal rod m^3 longitudinally sliding in sleeve m^4 formed in the lower portion of the frame M. The inner end of said rod m^3 has rigidly secured thereto the curved presser bar m^5, normally maintained by spring m^6 sprung away from the frame M, and in the circular path of the bottle on the corresponding bottle rest. When such bottle engages said presser bar, the rock-lever causes the roller Y to be forced into the path of the circular travel of lug h^2 of arm h. When there is no bottle on the corresponding bottle rest, the roller Y is spring-withdrawn into its barrel m, and out of the circular path of said lug h^2.

Each one of the three roller frames is adapted to be moved horizontally along the bar K, to the desired point of operation of its roller, at any time; and then to be clamped at such desired point of operation, by means of a collar l' rigid with the roller frame, and a set screw k; such collar embracing said bar K; such set screw being threaded in a suitable opening of the roller frame in horizontal line with said collar, and adapted to have inner end bearing against such horizontal circular bar K. The roller of each of such three roller frames maintains a constant height relatively to the horizontal rocking axis of valve C, throughout all engagement of such roller with the corresponding arm of such valve; such engagement being maintained throughout to one and the same side of said rocking axis, being always higher than such axis as regards roller 1 and 2, and being always lower than said axis as regards roller 3.

The machine is driven by horizontal power shaft n, carrying worm n' which meshes with worm gear wheel n^2 adjustably secured to the lower end of upright tubular shaft N. To the upper end of such shaft is adjustably secured the entire rotary machine construction comprising the beer tank, the actuating compressed fluid reservoir, and the radial formations which have common circular movement with such tank and reservoir. Located longitudinally and centrally within said tubular shaft N, throughout its entire length and extending beyond the same at both ends, is the beer tube O. The upper end of tube O communicates with

the central lower portion of beer tank A. Located longitudinally and centrally within tube O is tube P. Its upper end extends beyond the upper end of tube O, and into the upper central portion of tank A.

The apparatus (Figs. 1, 17–20) for receiving the filled bottles from the movable bottle rests, is formed with a horizontal plate R, having its one side provided with the angular guide 45 located out of the path of travel of the filled bottles on their bottle rests and to that side of said plate R which is nearest to said bottles in their said travel. The opposite side of said plate R and which is farthest from said bottles in their said travel, is provided with a horizontally movable bottle guide 46 adapted to be usually maintained projected out from said plate into the path of travel of the filled bottles on their horizontally traveling bottle rests. The inner end of such movable guide 46 is connected by vertical pivot 47 with the inner end portion of a guide 48. A helical spring 49 surrounds said pivot, between the upper and lower arms 49^a of said guide 46; and has its opposite extremities bearing respectively against said two guides 46 and 48, and tends to maintain said guide 46 in the path of travel of filled bottles on the bottle rests. A horizontal bar 50 has its inner end connected by vertical pivot 51 with a horizontal arm 52 projecting from the forward portion of said guide 46. Such bar 50 extends rearwardly, substantially parallel with guide 48, and has its rear end portion freely slidable in an aperture through pin 52^a secured to such guide 48. The lower edge of said bar 50 is serrated and adapted to engage with an upwardly projecting detent 53 carried by said pin 52^a. The construction being such that said movable guide 46 is maintained by said spring 49 in the path of travel of a filled bottle on its bottle rest so long as such bottle presents resistance less than said spring, and thereby aids in discharging such bottle from it rest on to said delivery plate R. But in event of any filled bottle on its rest presenting resistance in excess of that of the spring 49, said guide 46 thereupon yields, and swings out of the way of said traveling bottle; and said bar 50 automatically locks such swung rest 46 in its extreme swinging position, so as to prevent it from returning except when such bar is released by the operator, and said guide returned by the operator without injury to the other bottles. As each filled bottle, in turn, engages with said movable guide 46, the latter, aided by vertical flange g^6 at the rear edge of rest G, sweeps the bottles, under usual conditions, from off such rest, and on to plate R,—between guides 45 and 46, in proper discharge movement from the bottle rest. But, in event of any bottle offering such abnormal resistance to removal from its rest as had better be spring-yielded to than rigidly resisted; then, the pivoted guide 46 yields to same, and swings, toward the operator in the direction of travel of the bottle rest, so as to permit continued rotary passage of such bottle on its rest; and such swung guide is thereupon automatically locked out of the path of travel of the filled bottles on their rotating rests.

The whole guide wall 48 together with the spring-supported guide 46 and appurtenant parts is desirably rendered laterally adjustable upon plate R in order to adapt the width of the passage-way between guides 45 and 46 to bottles of different sizes. With this in view said wall 48 has its rear end pivotally held at 54, while its forward end is held in desired lateral position within the limits of a slot 55 by means of a clamp nut 56. Said bottle receiving plate R is adapted, by clamp device r', to be maintained in vertical adjustment on one of the uprights S of the outer and stationary frame work of the machine; which uprights support the said bar K, to which the frames of the three rollers 1, 2, 3 are severally secured.

The central vertical tubular support T incloses tubular shaft N, and supports the entire rotary construction of the machine. Such central tubular support T has loosely fitted about it a sleeve t, whose lower portion is formed with horizontal outwardly projecting disk t^2, to which are rigidly connected the bearing bars g^2. Hand nut t' is threaded exteriorly about the lower portion of said tubular support T, and is adapted to vertically adjust such sleeve t upon said support T, being provided with radially projecting arms t^4 to facilitate its adjustment. The vertical adjustment, thereby caused, of said bearing bars g^2 acts correspondingly with reference to the bottle rests G; and causes the latter to be properly supported by such bearing bars, correspondingly with the varying lengths of bottles which may be used.

The beer tank is provided with automatic means for maintaining conditions of desired relative pressure of different fluids within such tank,—as follows: Ball float a has upwardly extending stem a' to whose upper extremity is pivoted the power end of valve stem a^2; such valve stem being a lever of the second order, and having its fulcrum end horizontally pivoted to hanger a^3 of the tank top; valve a^4 is located between said two pivotings of its stem, and controls communication between the upper interior portion of said tank and the escape passage a^5; the latter passage being provided at its upper end with vent cock a^6.

During the operation of the machine, the supply of the beer to tank A is automatically

controlled by the regulating mechanism connected with the horizontal lower portion 1 of the beer supply pipe *o*. When the machine is first started, the cock 17 is opened and the cock 16 closed. But, after the machine is started, such cock 17 is closed and the cock 16 opened; thereby causing the pressure of the air on the top of the beer in beer tank to be the same as the pressure of the air on the top of the diaphragm 12 within the diaphragm chamber 8.

The weight 9 may be adjusted longitudinally of the lever 5; corresponding with the degree of pressure desired for the beer within tank A. If the circumstances be such that it is desirable to fill the bottles with beer under high pressure; then, the weight 9 is moved suitably away from fulcrum 6, so as to require greater air pressure on the top of diaphragm 12, in order to overcome the lifting tendency of the short arm of said lever 5, and depress plunger valve 4 so as to arrest the flow of beer to the tank. On the other hand, if the circumstances be such that it is desirable to have the beer flow into the bottles under less pressure; then, the weight 9 is moved correspondingly toward fulcrum 6, and correspondingly less air pressure will then suffice to depress diaphragm 12 with corresponding depression of plunger valve 4, and resulting in arrest of fluid flow to the tank. The outer circular series of air-charging ways *b* whose receiving ends are located in the upper portion of said tank, are maintained free from foam or impurities brought or caused within said tank by the inner circular series of vent ways b^2. Such maintenance is obtained by the circular guard located between and concentrically with said two series *b* and b^2 of fluid ways. Such guard permitting free passage of air, after discharge from said vent ways b^2, through the screen 23; while said screen prevents passage therethrough of such form and impurities as said air may be connected or charged with, on the inner side of the screen. The pure air which emerges from the outer side of said screen, thereupon passes through the passages 21 of the circular partition 19, and is thereupon free to reënter the upper ends of the air charging ways *b*. The continuous close bearing of said partition 19 and screen 23 against the underside of the top of tank A, together with the close-bodied circular wall 24 depending from said partition, prevent discharge of foam or impurities from the circular space inclosed within such guard, to the circular space surrounding such guard. The compressed air can thus be used in continuous rounds of operation; charging the empty bottles therewith, and being vented into the beer tank as such air is forced from out the bottles while the latter are being filled with beer. During such operation, simultaneously with the automatic control of such air pressure by the valve a^4, float *a* of the air escape device is excluded from the foam or impurities within the tank A, by the circular screen 25, and only pure air finds escape through the escape valve a^4. Such screen 25 and wall 24 extend, substantially alike, sufficiently near to the bottom of the beer tank to be below the level of the beer of said tank; thus preventing all foam or air impurities from passing under the lower edge of either such screen or wall.

Further description of operation of the machine, as applied to any one bottle, is as follows: The tubular shaft N is rotating, so as to move the radial arm B and the bottle rest G in circular travel. The operator stands facing the machine front, shown in Fig. 1, with the bottle receiving table at his right. He places the empty bottle upon the empty bottle rest, in its lowermost position, as such bottle rest is passing before him. The bottle neck fitting device (Figs. 1, 6, 7 and 8), with which the permanent rest G is provided, permits of placing the bottle readily in proper position so that the beer filling tube will enter the mouth of the bottle without striking the wall thereof as the bottle is moved upwardly to inclose such tube, during the movement of the bottle toward its mouth piece. The loop 30 of the rod 27 permitting the ready lateral introduction of the neck of a bottle therein, as the bottle is hurriedly placed by the operator upon its rest G; in such manner and with such result as to cause the bottle to be in exactly true position for its proper up-movement. The formation of the bottom of the rest G at other than a right angle to its stem *g* (Fig. 7) aids the operator in placing the bottle in proper position on such rest; the downwardly and rearwardly inclination of the bottom of such rest G permitting the operator to readily place thereon the bottle in upright true position. If the bottle be large, the permanent bottle rest G is to be used without the supplemental bottle rest 31 (Fig. 9), and without the supplemental diametrical reducer g^7. (Figs. 1 and 12.)

When the sectional beer filling tube D (Figs. 1 and 4) is used for filling a long bottle, the lower transverse section d^4 is to be correspondingly longer than when the tube is used for filling a shorter bottle; thus permitting the mouth of each length bottle to be properly sealed against its mouth piece, while the beer filling tube depends sufficiently within the bottle.

Annular boss 44 (Fig. 11) of non-sectional beer filling tube D′, as the latter is used for a long bottle, prevents the mouth of the bottle from striking the lower end of tube d', as the operator hurriedly passes the empty bottle in upward movement toward its mouth piece; thus preventing such tube

from becoming jammed or injured as the bottle mouth is placed about it. The non-sectional beer filling tube D′ (Figs. 11–13) is adapted for use in the filling of a pint bottle, by means of the supplemental mouth piece 36 used dependent from the permanent mouth piece.

The use of the different modes for adapting the machine for filling bottles of different sizes, is as follows:

According to mode number one,—the sectional beer filling tube D will be used, the bearing bars g^2 and also the receiving plate R being vertically adjusted to correspond with the length of the bottles that are to be then filled. If the bottle be a pint bottle, the supplemental diametrical reducer g^7 is to be used, and a short lower section d^4 is to be used instead of a long lower section d^4.

According to mode number two,—the bearing bars g^2 will require no vertical adjustment; but the receiving plate R is to receive proper vertical adjustment. The supplemental bottle rest 31 will be used, connected to the permanent bottle rest G. A short transverse section d^4 will be used instead of a long transverse section d^4.

According to mode number three,—there is no vertical adjustment of the bearing bars g^2 nor of the receiving table R. There is no change connected with the beer filling tube; but such tube is the non-sectional one D′ as distinguished from the transverse sectional one D. The only change is in connecting, or disconnecting, the supplemental mouth piece 36.

In adapting the machine for the filling of bottles known as splits, the equipment shown in Fig. 14, is used,—the mouth piece link being interposed between the permanent mouth piece and the supplemental mouth piece.

In filling a short bottle, said second mode of procedure would be as follows: The permanent bottle rest G will be equipped with the supplemental bottle rest 31, (Figs. 9 and 10); such supplemental bottle rest having legs 32 of length such as to cause the mouth of the pint bottle placed thereon to be the same distance from the permanent rest G as the mouth of a quart bottle is when placed on such rest. The flange 35 of this supplemental rest is correspondingly close to the line of the vertical axis of stem g, so that such flange will center the small bottle thereon, in proper position for its up-movement; the same as flange g^6 properly centers a large bottle placed on the permanent rest G.

According to said third mode of procedure, instead of using said supplemental bottle rest 31, (Figs. 9 and 10) while filling a small bottle, the supplemental mouth piece 36 (Figs. 12 and 13) will be used. Such supplemental mouth piece being of length corresponding with the difference between the lengths of a long bottle and a short bottle; the same as the supplemental bottle rest was of length corresponding to such difference. Such supplemental mouth piece is readily slipped up into close joint with the permanent mouth piece, and the spring clamps 40 insure maintenance of such joint. The tube 42 of such supplemental mouth piece having its lower portion of its side wall decreasing in thickness to its lowest end; while the passage 41 decreases in diameter in its downward extension, so as to be substantially closed at its extreme lower end of the beer filling tube. The upper arm h of the corresponding rock device H is at such time just in front of roller X, in the circular path of movement of such arm. The corresponding bottle rest G, in vertical line with said valve, is in its lowermost position. The compressed actuating fluid from reservoir E is exerting its pressure against both the upper and the under faces of piston f' and against the upper face of piston f^3; whereby said piston f' is balanced, and said piston f^3, by the intermediate mechanism, maintains the said particular bottle rest in its lowermost position. The then position of the valve C closes the waste way c^4 from communication with the lower transverse part of fluid way b^3, and maintains such lower transverse part in communication with the upper transverse part of such fluid way. Horizontal lug h^2 at the top of arm h of rock device H, as the latter continues its travel circularly and horizontally, engages with roller l; thereby rocking said arm upwardly and rearwardly and causing partial rotation of the valve C secured to such device H; after which, such lug h^2 passes over said roller X. The upper transverse part of fluid way b^3 is thereby closed from communication with the lower transverse part; and the latter part is placed in communication with the waste way c^4. The compressed actuating fluid in cylinder F above piston f' is thereby relieved, causing the pressure of compressed actuating fluid against the under face of said piston to raise the piston rod f^2; the latter by the intermediate mechanism, raising the bottle rest to its uppermost position, with the mouth of the bottle pressed properly against the mouth piece,—ready for the filling operation. Thereafter, the bottle, on its appropriate rest, is carried in its circular horizontal travel, against the curved presser bar m^5; pressing the latter away from its projection into the path of travel of said bottle; thereby operating rock lever m^2 so as to force roller v into the path of circular horizontal travel of lug h^2. Initial engagement between said two latter members thereupon operates said rock device H and rotates valve C. Compressed air in the upper portion of beer tank A

thereupon passes into the bottle; thereby causing the same pressure to exist in the bottle as exists in such tank. Further engagement of said lug h^2 with roller v further rotates the rock device H and further rotates the valve C. The air inlet way b is thereby closed from communication with the bottle; while the vent-way b^2 is placed in open communication with the bottle. Still further engagement of said lug h^2 with roller v then takes place; still further rotating the rock device H, and still further rotating the valve C; whereby the beer tank is placed in communication with the bottle, by beer way b' and channel c', while the said previously stated open communication of way b^2 and channel c^2 is still maintained; permitting the bottle to be filled with beer, solely by its gravity flow, while the air or gas or foam displaced from such bottle passes through said vent-way b^2 into the upper portion of the beer tank A. The bottle is then carried around to the opposite side of the machine, where the lower arm h' of the rock device H is engaged by roller Z, rocking such arm rearwardly and upwardly; rocking such device H and rotating the valve C; closing all communication between the beer tank and the bottle; causing waste way c^4 of the plug C to be closed from communication with the lower transverse part of fluid way b^3, and causing plug channel c^3 to register with the intervening transverse parts of the actuating fluid way b^3. Thereby all further inlet or outlet relative to the bottle contents is prevented, and the filled bottle is in condition to be lowered from its upper pressure against the mouth piece; whereupon, the piston f' has its upper and lower faces balanced by like pressure of the actuating fluid; and such actuating fluid, by its pressure against the upper face of piston f^3, carries the bottle rest into its lowermost position. The filled bottle is thereby placed entirely below and out of horizontal line with the filling tube. It is then carried on its horizontally traveling rest into suitable proximity with such bottle receiving plate R. It is there engaged by the guide 46, being embraced between the latter and the upright flange g^6 of its rest. If such filled bottle offers usual resistance, only such as may be well overcome by said guide 46, it is thereupon swept from off its rest, and is received on said plate R. The filled bottle last previously delivered on such plate, is then pushed along on the latter by the bottle now delivered. And the bottle rest thus last emptied, is now ready for a repetition of the foregoing described operation. If any filled bottle on its bottle rest should offer resistance to guide 46 in excess of the resistance of such guide, so as to swing the latter and to permit such bottle to pass; then, the bar 50 will automatically lock such guide in its swung position and thus prevent it from flying in return movement,—to the injury of the bottles following the bottle which swung the guide. The operator may then properly lift said bar 50, so as to clear its serrated lower edge from detent 53; and permit the spring 47 to operate properly under his control, in returning the guide 46 to its usual position, without any damage. While such foregoing described operation has been carried on, like operation has been carried on as regards all of the other like sets of said members, composing the machine.

The invention may be used to fill any suitable vessels. Wherever the term bottle occurs in the foregoing description or the following claims, the same should be understood as including, under the rule of equivalents, any suitable vessel, as a known substitute for a bottle.

The invention may be used to bottle any suitable fluid. Wherever the term beer occurs in the foregoing description or the following claims, the same should be understood as including, under the rule of equivalents, any suitable fluid, as a known substitute for beer.

The invention may be used with any suitable fluid for charging the empty bottles, and with any suitable fluid for actuating the piston mechanism of the bottle rests. Wherever the term air occurs in the foregoing description or the following claims, the same should be understood as including, under the rule of equivalents, any suitable fluid, as a known substitute for air.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a bottle filling machine, the combination of a beer tank having an air-charging way and an air-venting way for a bottle, a partition between such two ways adapted to permit air to pass while preventing foam or impurity, substantially as set forth.

2. In a bottle filling machine, the combination of a beer tank having an air-charging way and an air-venting way for a bottle, a partition separating such two ways and having a screen-guarded passage permitting air to pass while preventing foam or impurity, substantially as set forth.

3. In a bottle filling machine, the combination of a beer tank having an air-charging way and an air-venting way for a bottle, a partition between such two ways perforated to permit air to pass while preventing foam or impurity, said partition extending

to the top of said tank, substantially as set forth.

4. In a bottle filling machine, the combination of a beer tank having an air-charging way and an air-venting way for a bottle, a partition between such two ways having perforations adapted to permit air to pass while preventing foam or impurity, said partition being spring-pressed against the top of said tank, substantially as set forth.

5. In a bottle filling machine, the combination of a beer tank having an air-charging way and an air-venting way for a bottle, a partition between such two ways having its upper portion provided with passage guarded by screen perforated to permit air to pass while preventing foam or impurity, substantially as set forth.

6. In a bottle filling machine, the combination of a beer tank having two concentric series of ways projecting upwardly from its lower portion, one of said series being for charging bottles with compressed air, the other series being for venting the bottles while they are being filled with beer, a circular partition located between such two series and having upper edge bearing against the tank top, the upper circular portion of such partition formed with passage provided with screen adapted to permit air to pass while preventing foam or impurity, substantially as set forth.

7. In a bottle filling machine, the combination of a beer tank having two series of fluid ways projecting upwardly from its lower portion, one of said series being for charging the bottles with compressed air, the other series being for venting the bottles while being filled with beer, a partition located between such two series and having upper edge bearing against the tank top, said partition having upper and lower series of blocks projecting horizontally therefrom, a screen having its upper and lower portions fastened to said blocks and having its upper edge bearing against the tank top, said partition formed with air passage opposite said screen, substantially as set forth.

8. In a bottle filling machine, the combination of a beer tank having two concentric series of fluid ways projecting upwardly from its lower portion, the outer series being for charging the bottles with compressed air, the inner series being for venting the bottles while being filled with beer, a circular partition located between such two series and having upper edge bearing against the tank top, said partition having upper and lower series of blocks projecting toward said series of venting ways, a circular screen having its upper and lower portions fastened to said blocks and having its upper edge bearing against the tank top, said partition formed with air passage in the same horizontal plane with said screen and having a close-bodied circular wall depending lower than said screen, substantially as set forth.

9. In a bottle filling machine, the combination of a beer tank provided with an air escape passage, a valve for the latter automatically operated by a depending float, a screen surrounding said float and having perforations which permit air to pass while preventing foam or impurity, substantially as set forth.

10. In a bottle filling machine, the combination of a beer tank having its top provided with an air escape passage, a valve for the latter, a float depending from said valve, a partition extending from said tank top and horizontally surrounding said float, the perforations of such partition permitting air to pass while preventing foam or impurity, substantially as set forth.

11. In a bottle filling machine, the combination of a bottle-bottom rest, and an upwardly extending rod secured to such bottom-rest and provided at its upper portion with a double loop formation, the outer loop of which is adapted to permit the lateral introduction of the neck of the bottle as the latter is laterally placed upon such bottom-rest, substantially as set forth.

12. In a bottle filling machine, the combination of a bottle-bottom rest, and an upwardly extending rod secured to such bottom-rest and provided at its upper portion with a horizontal double loop formation, the outer loop of which is adapted to permit the lateral introduction of the neck of the bottle as the latter is laterally placed upon such bottom-rest, a clamp device securing said rod in vertical adjustment upon said bottom rest, substantially as set forth.

13. In a bottle filling machine, the combination of a bottle-bottom rest having a rear vertical flange provided with a vertical aperture, a vertical rod fitted in said aperture, a set screw threaded in the rear exterior wall of said aperture and having end bearing against said rod, such rod having its upper portion provided with a horizontal double loop formation, the outer loop of which is adapted to permit the lateral introduction of the neck of a bottle as the latter is laterally placed upon said bottle-bottom rest, substantially as set forth.

14. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest secured in a position inclined with respect to the line of movement of said support, substantially as set forth.

15. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest having certain

lateral portion lower than certain other portion, so as to present a surface inclined to the line of movement of said support, substantially as set forth.

16. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest rearwardly inclined downwardly, substantially as set forth.

17. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a vertical stem carrying a horizontally inclined bottle-bottom rest, substantially as set forth.

18. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a vertical stem carrying a bottle-bottom rest rearwardly and downwardly inclined, substantially as set forth.

19. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest formed in horizontal inclination and provided with an upwardly projecting side flange, substantially as set forth.

20. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest having a rear upwardly projecting flange and having that portion of itself adjacent to said flange formed inclined downwardly and rearwardly, substantially as set forth.

21. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest having its rear portion formed inclined downwardly and rearwardly and provided with an upwardly projecting rear flange, and a bottle-neck fitting device secured in vertical adjustment to said flange, substantially as set forth.

22. In a bottle filling machine, the combination with a bottle mouth-piece, of a bottle support vertically movable toward and away from said mouth-piece, said support including a bottle-bottom rest having its rear portion formed downwardly and rearwardly inclined and provided with an adjacent upwardly projecting flange having a vertical aperture, an upright rod vertically adjustable in said aperture, and a set screw threaded in the rear wall of said aperture and having end-bearing against said rod, such rod having its upper portion provided with a horizontal double loop formation, the outer loop of which is adapted to fit about the neck of a bottle upon said bottle rest, substantially as set forth.

23. In a bottle filling machine, the combination with a mouth piece having a depending air tube, of a beer tube passing through such mouth piece and having immediate portion below such mouth-piece provided with a lateral projection and also having downwardly extending formation below said projection of less lateral extension than such projection, substantially as set forth.

24. In a bottle filling machine, the combination with a mouth piece having a depending air tube, of a beer tube having portion immediately below such air tube formed with a circular enlargement decreasing diametrically in downward extension and having extending portion below said enlargement of less diameter than the latter, substantially as set forth.

25. In a bottle filling machine, the combination with a mouth piece having a depending air tube, of a beer tube passing through such air tube clear therefrom and formed immediately below same with a diametrical enlargement decreasing downwardly and thereafter formed straight sided and of less diameter than said enlargement, substantially as set forth.

26. In a bottle filling machine, the combination with a traveling bottle rest, of a movable bottle guide provided with means whereby it is maintained in the path of travel of a filled bottle on said bottle rest presenting normal resistance and whereby it is moved out of said path by a filled bottle on said bottle rest presenting abnormal resistance, such guide provided with means adapted to maintain it against return movement when moved as described out of said path by a bottle presenting abnormal resistance, substantially as set forth.

27. In a bottle filling machine, the combination with a traveling bottle rest, of a movable bottle guide provided with spring means that maintain it in the path of travel of a filled bottle on said bottle rest presenting only certain resistance and that permit it to be moved out said path by a filled bottle on said bottle rest presenting more than such certain resistance, and automatic locking means adapted to retain said guide in its position as moved out of said path after such moving bottle has left it, substantially as set forth.

28. In a bottle filling machine, the combination with a horizontally-traveling bottle rest, of a bottle guide adapted to extend into the path of travel of a filled bottle on said bottle rest, such guide being vertically pivoted at a point out of said path and provided with a horizontal projection, together

with a horizontal member connected with said projection and adapted to maintain said guide out of said path when moved there by a bottle on said bottle rest, substantially as set forth.

29. In a bottle filling machine, the combination of a horizontally-traveling bottle rest, a horizontally-movable bottle guide provided with a spring tending to maintain it in the path of travel of a filled bottle on said bottle rest, a bar loosely connected to said guide, a device adapted to automatically lock said bar against return movement when moved as said guide is moved out of said path, substantially as set forth.

30. In a bottle filling machine, the combination of a horizontally-traveling bottle rest, a horizontally-movable bottle guide provided with a spring tending to maintain it in the path of travel of a filled bottle on said bottle rest, a bar pivoted to said guide and having a serrated edge, a detent adapted to interlock with the latter, substantially as set forth.

31. In a bottle filling machine, the combination of a horizontally-traveling bottle rest, a horizontally-movable bottle guide provided with a spring tending to maintain it in the path of a filled bottle on said bottle rest, a bar having one end pivoted to said guide and having a serrated lower edge, a pin having an aperture through which said bar slides and having an upwardly projecting detent which engages said serrated edge, substantially as set forth.

32. In a bottle filling machine, the combination of an upper mouth piece, a lower mouth piece, a mouth piece link interposed between said upper and lower mouth pieces, substantially as set forth.

33. In a bottle filling machine, the combination of an upper mouth piece, a lower mouth piece, a mouth piece link interposed between said upper and lower mouth pieces, said mouth piece link having its opposite end portions respectively shaped in counterpart to the corresponding shaped end portions of said upper and lower mouth pieces, substantially as set forth.

34. In a bottle filling machine, the combination of an upper mouth piece, a lower mouth piece, a mouth piece link interposed between said two mouth pieces, such link consisting of a head having an upper concave face provided with a depending central tube, and a gasket fitted to the lower face of said head and surrounding said tube, substantially as set forth.

35. In a bottle filling machine, the combination of an upper mouth piece, a lower mouth piece, a mouth piece link interposed between said two mouth pieces, such link consisting of a metal head having an upper concave face provided with a depending central metal tube, and an elastic gasket fitted to the lower face of said head and surrounding said tube and having its lower portion of circular wedge shape, substantially as set forth.

Signed by me, this 24th day of July, 1906.

JOSEPH H. CHAMP.

Attested by—
E. T. SARGENT,
D. T. DAVIES.