

T. BAINES, SR. & E. L. BAINES.
MACHINE FOR FILLING BOTTLES OR OTHER RECEPTACLES.
APPLICATION FILED DEC. 28, 1907.

915,725.

Patented Mar. 23, 1909.

3 SHEETS—SHEET 1.

fig. 1.

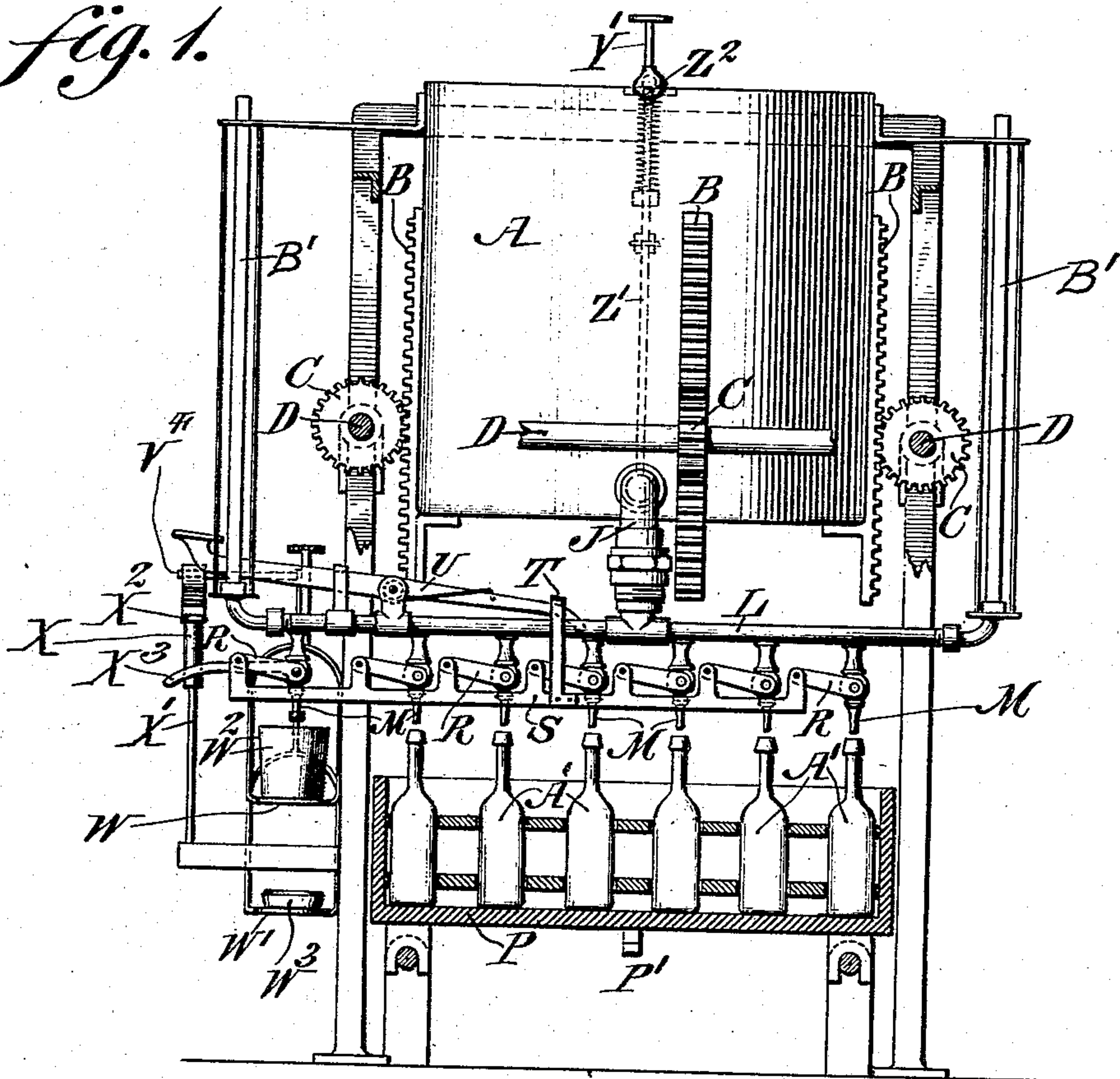


fig. 9.

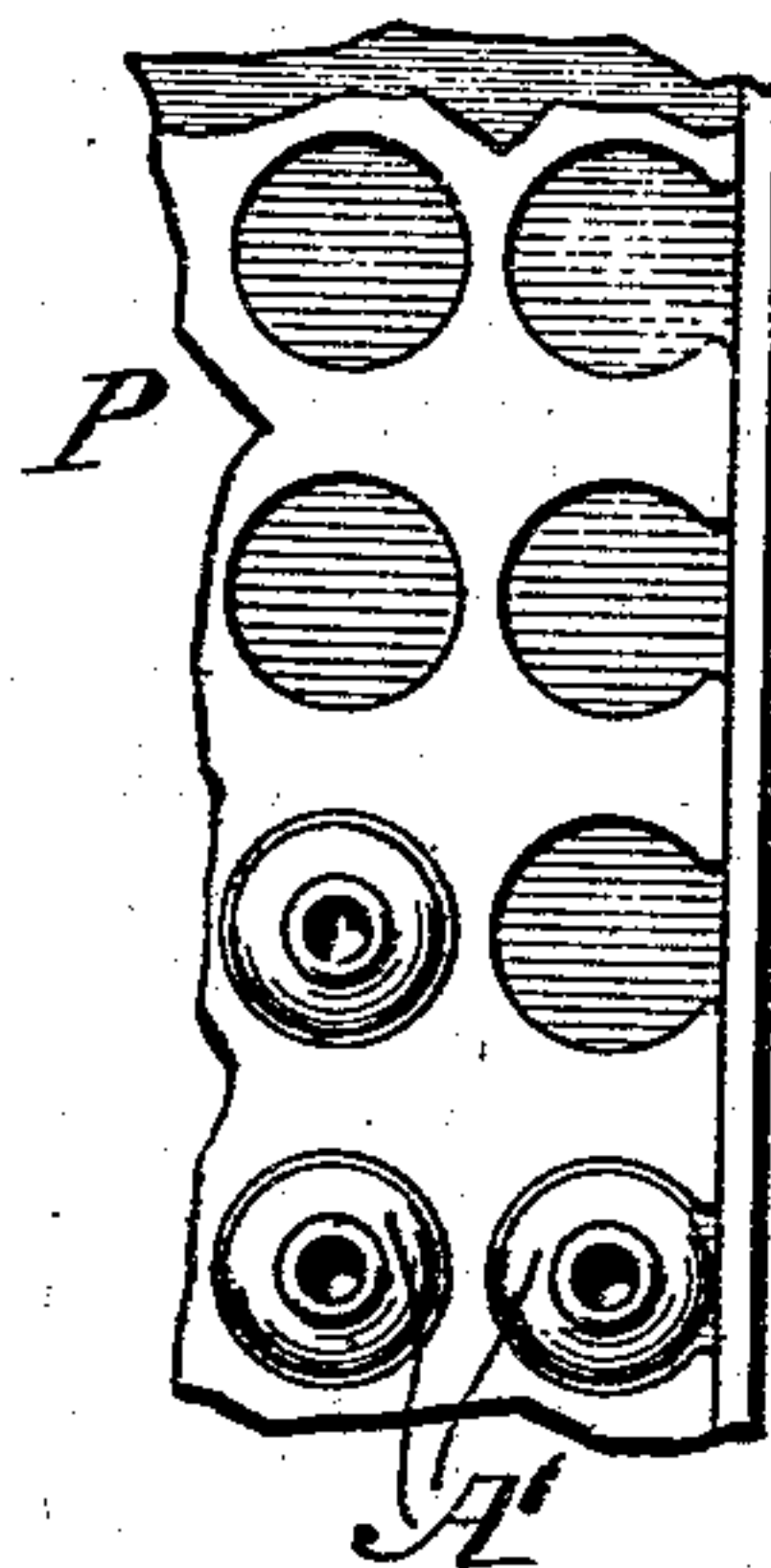


fig. 10.

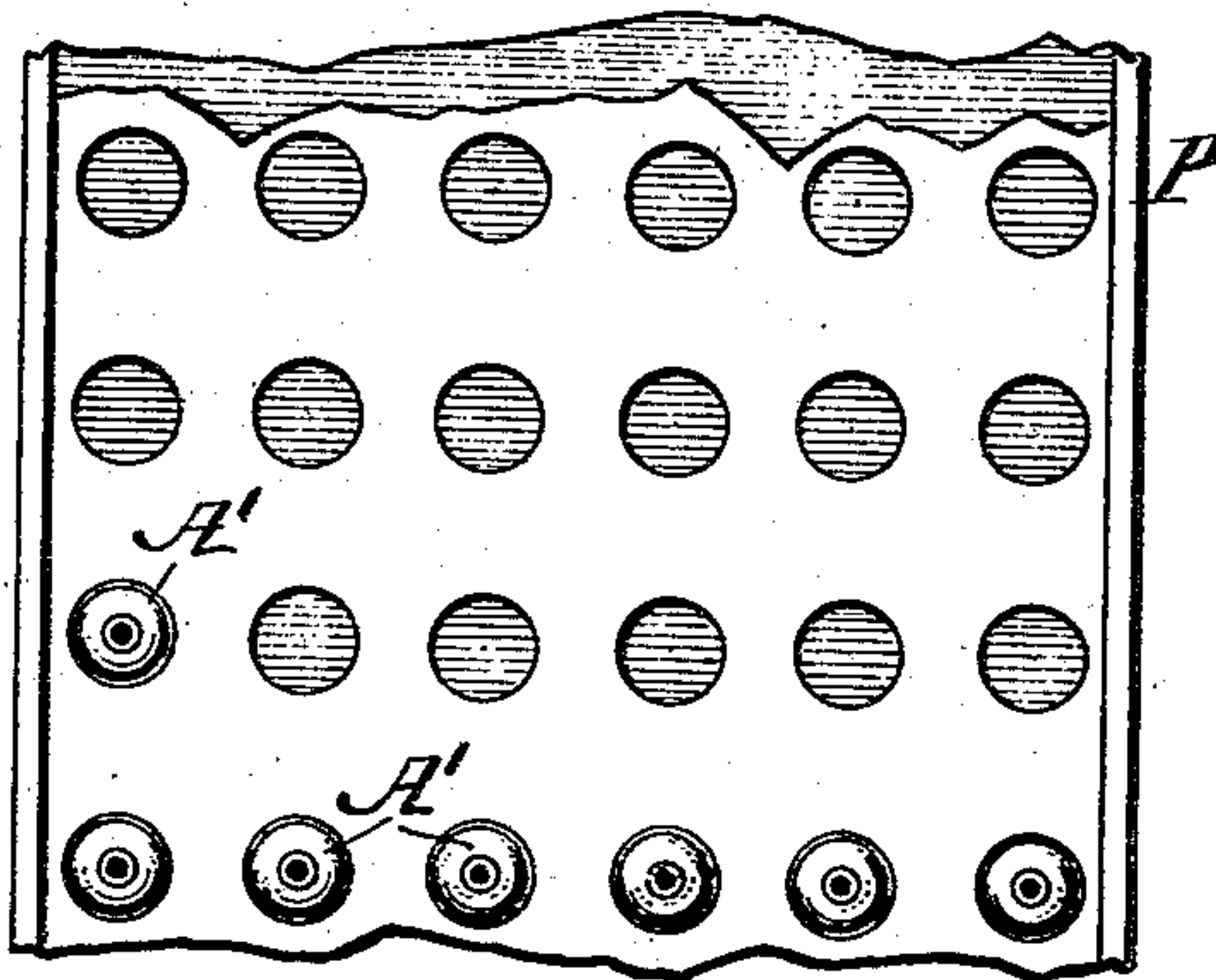
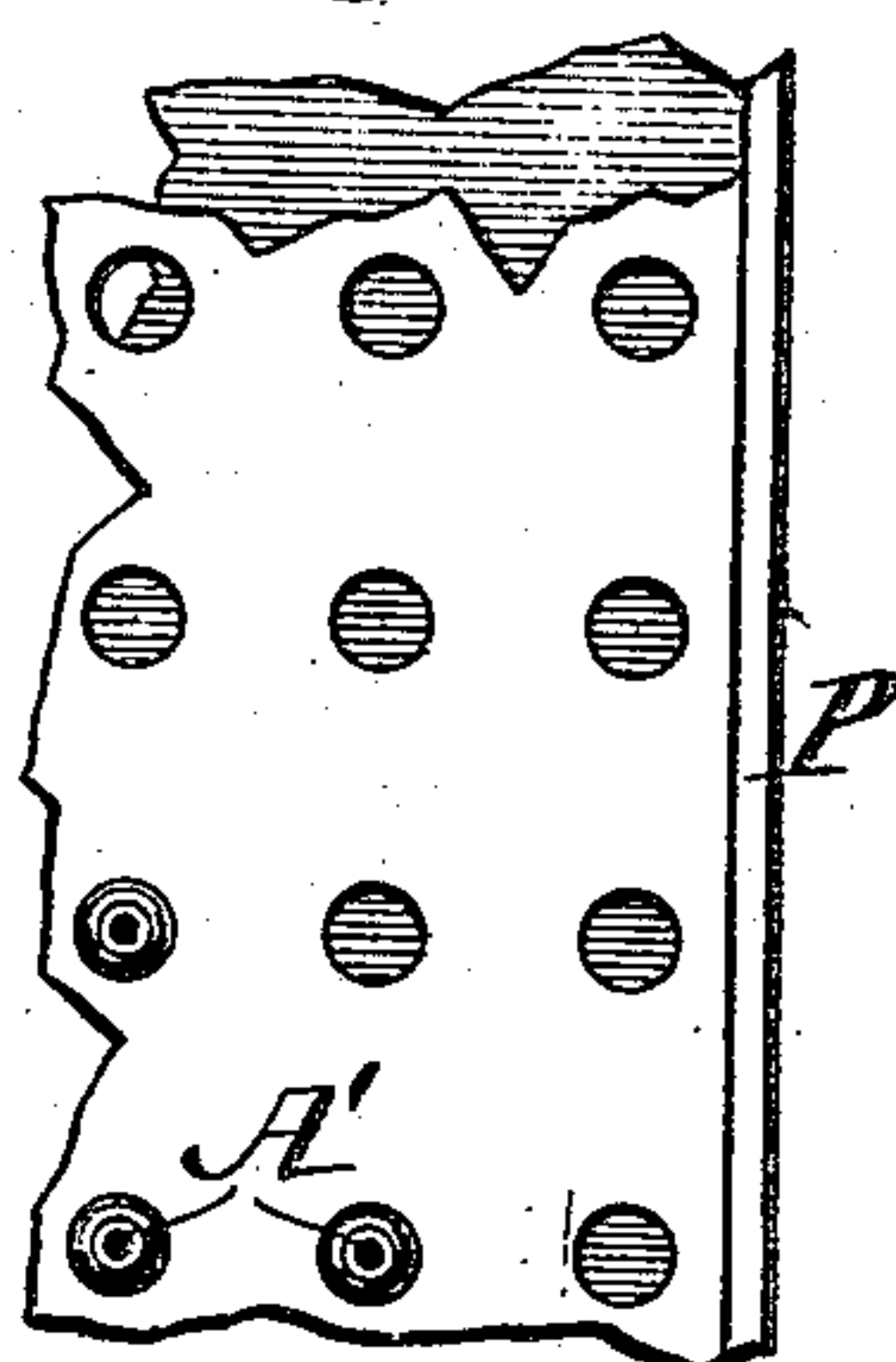


fig. 11.



Witnesses

L. Duville,
P. F. Nagle.

Inventors

Thomas Baines Sr.
Edmond Les Baines
By Riederer & Fairbanks.

Attorneys

T. BAINES, SR. & E. L. BAINES.
MACHINE FOR FILLING BOTTLES OR OTHER RECEPTACLES.
APPLICATION FILED DEC. 28, 1907.

915,725.

Patented Mar. 23, 1909.

3 SHEETS—SHEET 2.

fig. 2.

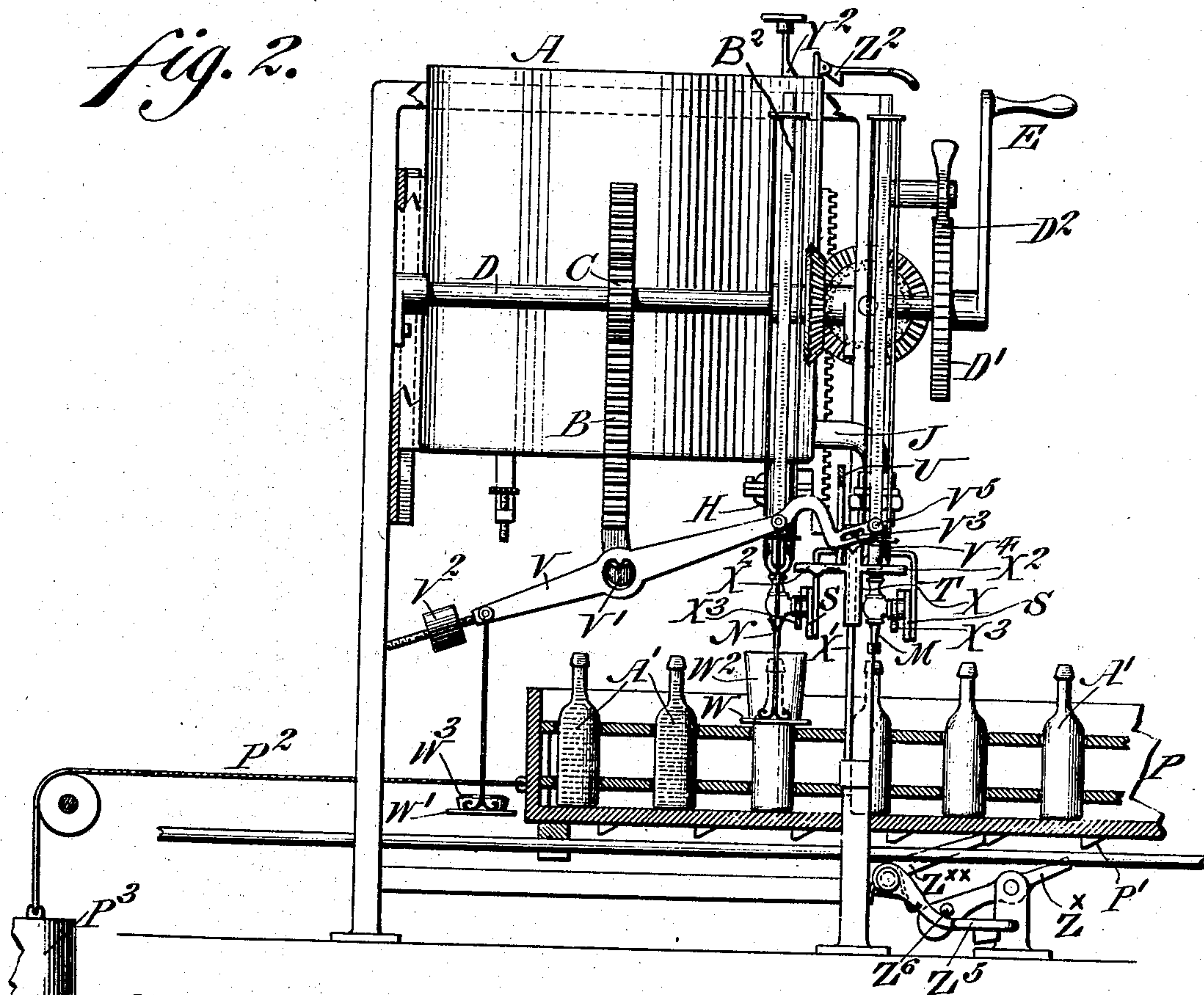


fig. 3.

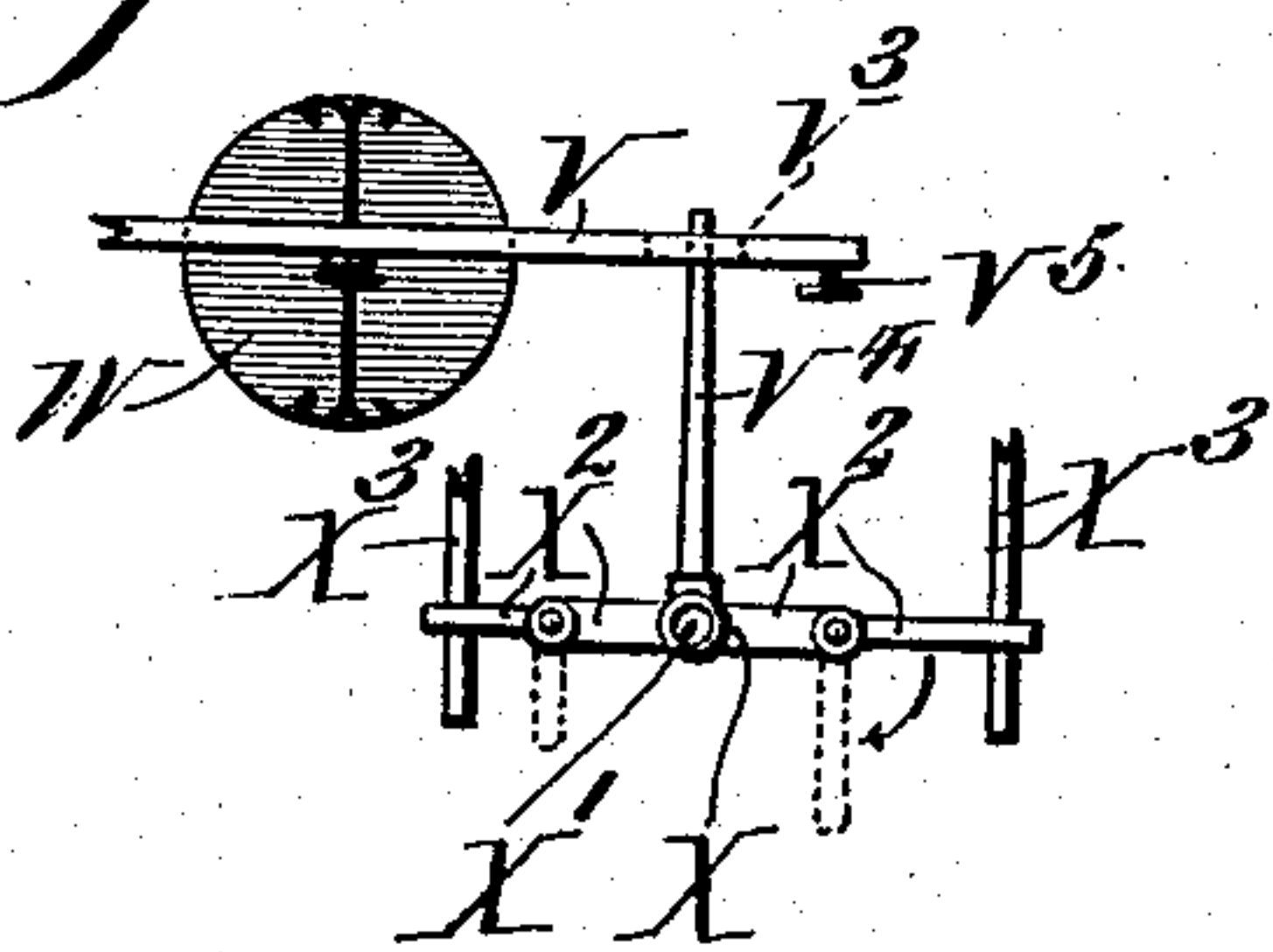


fig. 5.

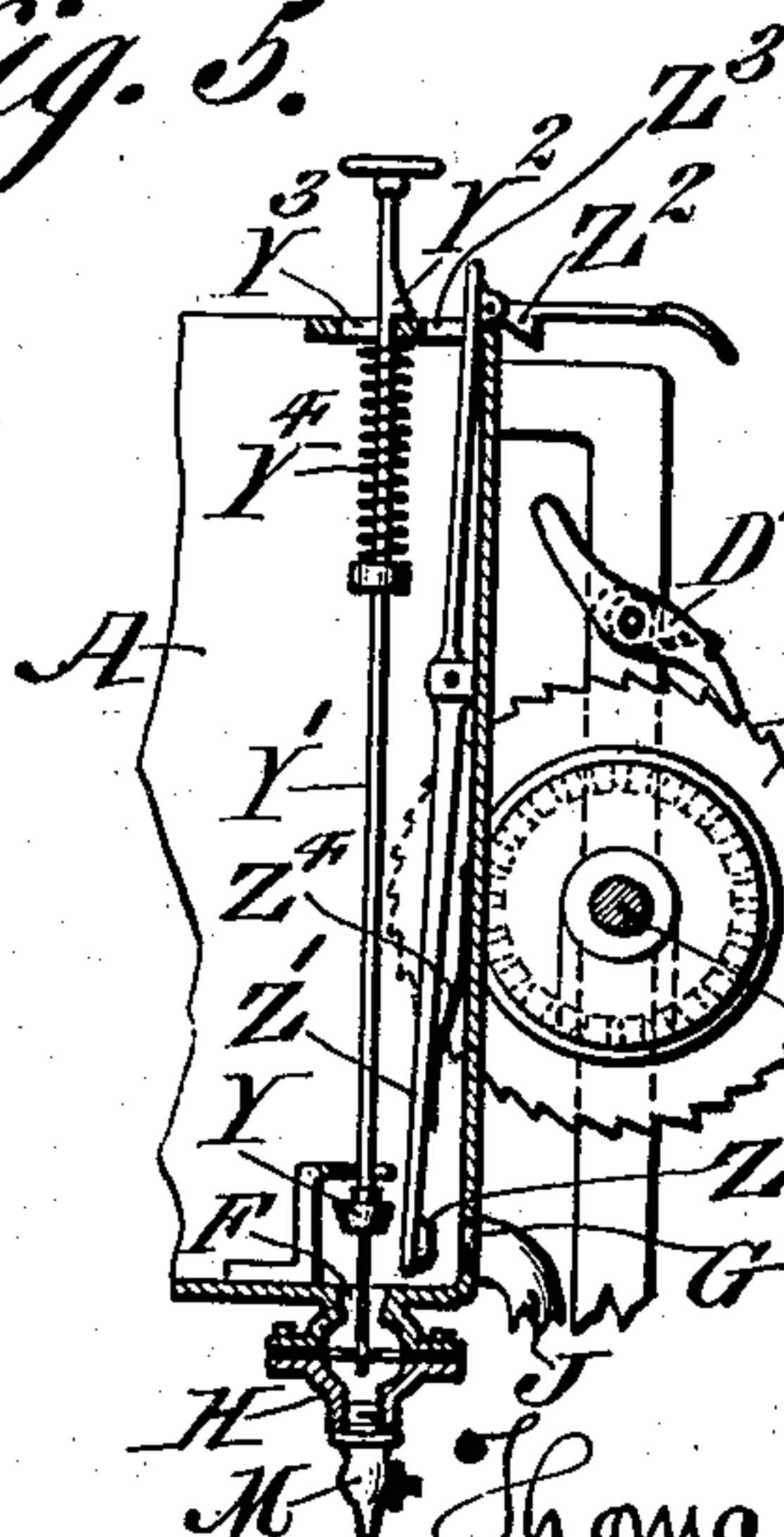


fig. 6.

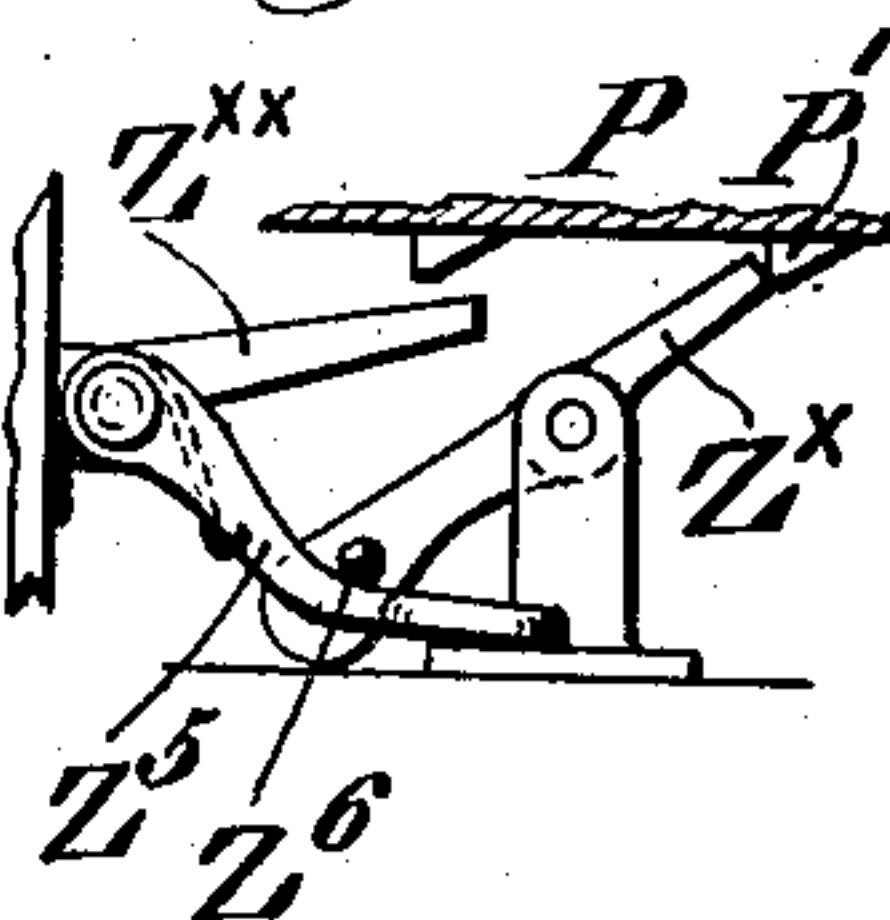
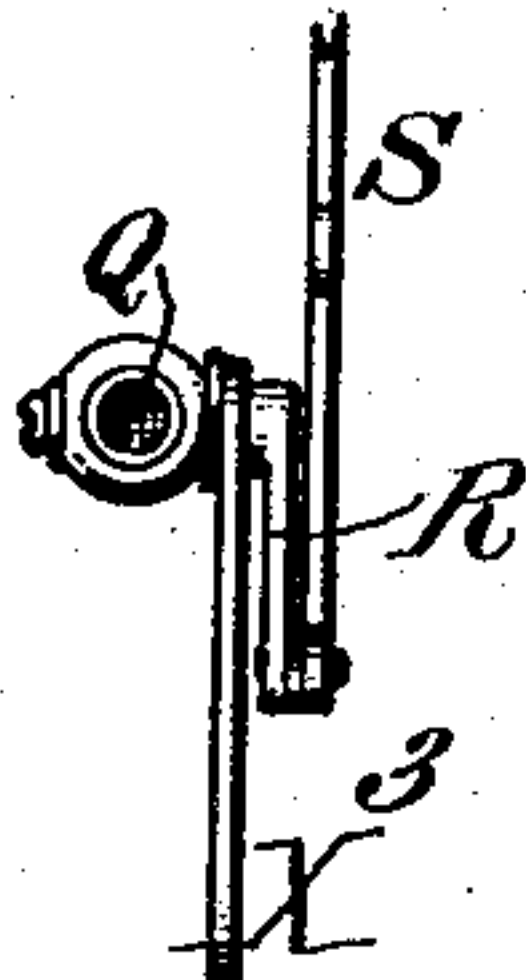


fig. 4.



Witnesses
L. Douville,
P. F. Nagle.

Inventors
Thomas Baines Sr.
Edmond Lee Baines.
By Diederheim & Fairbank
Attorneys

T. BAINES, SR. & E. L. BAINES.
MACHINE FOR FILLING BOTTLES OR OTHER RECEPTACLES.
APPLICATION FILED DEC. 28, 1907.

915,725.

Patented Mar. 23, 1909.

3 SHEETS—SHEET 3.

fig. 7.

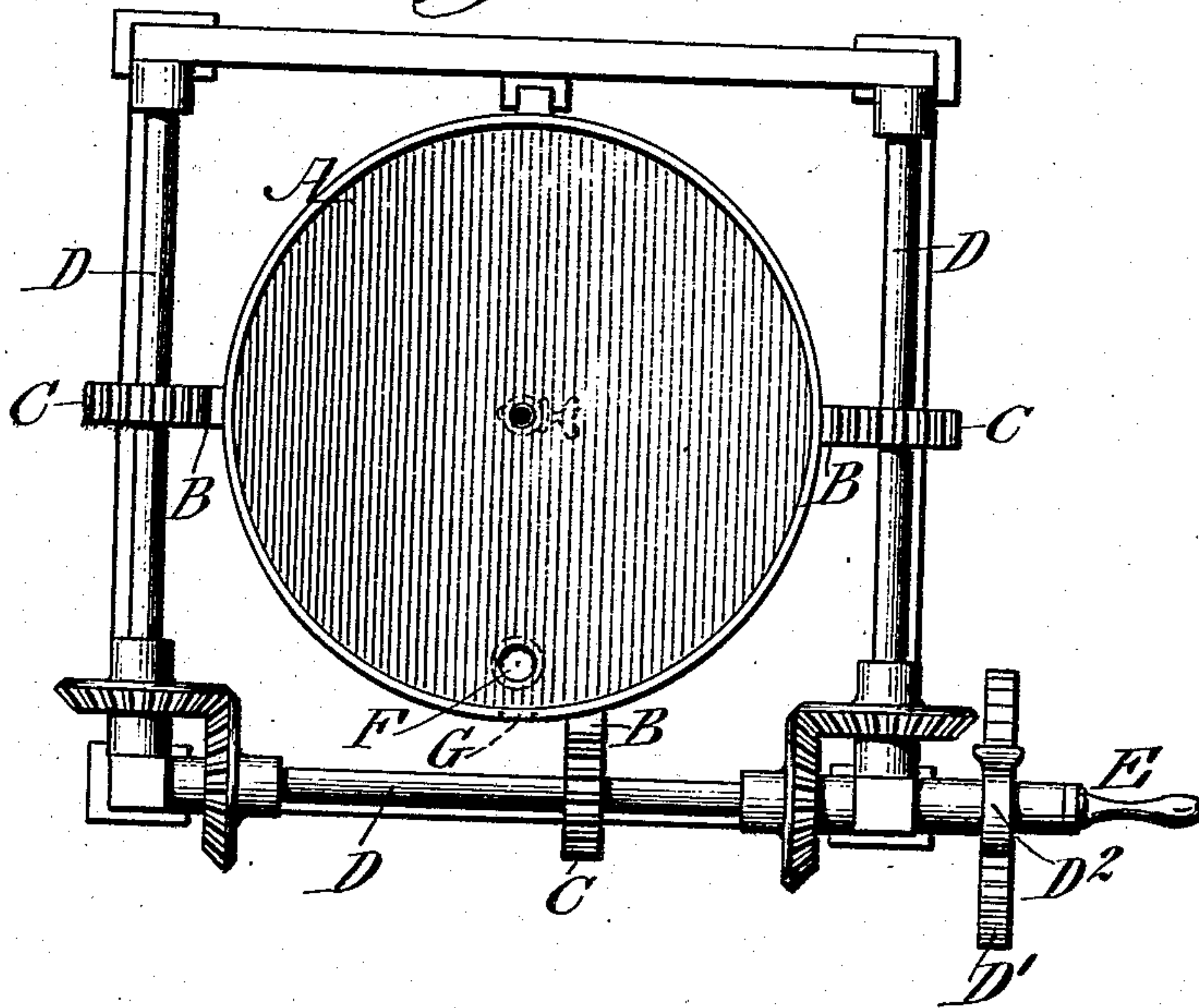
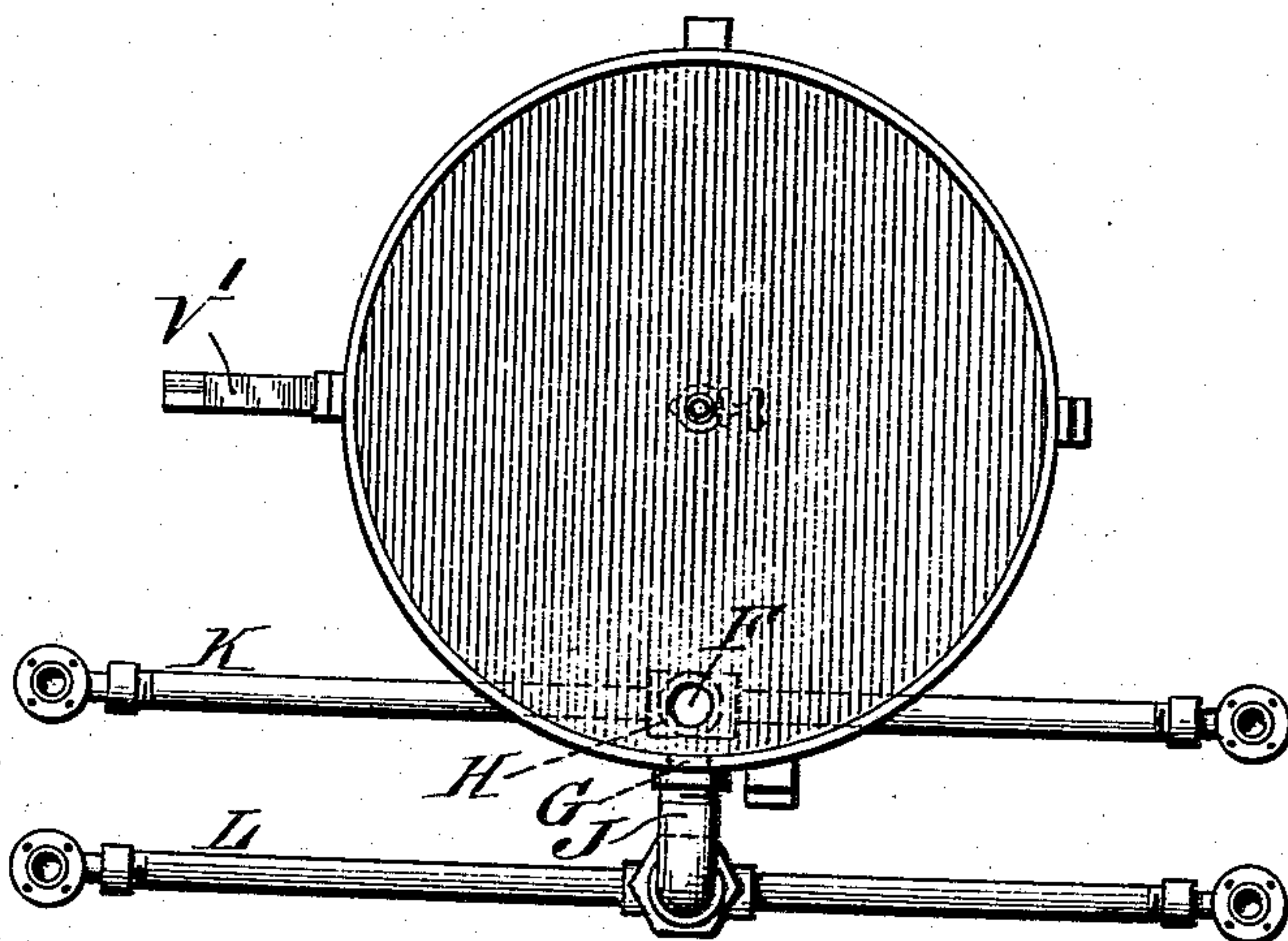
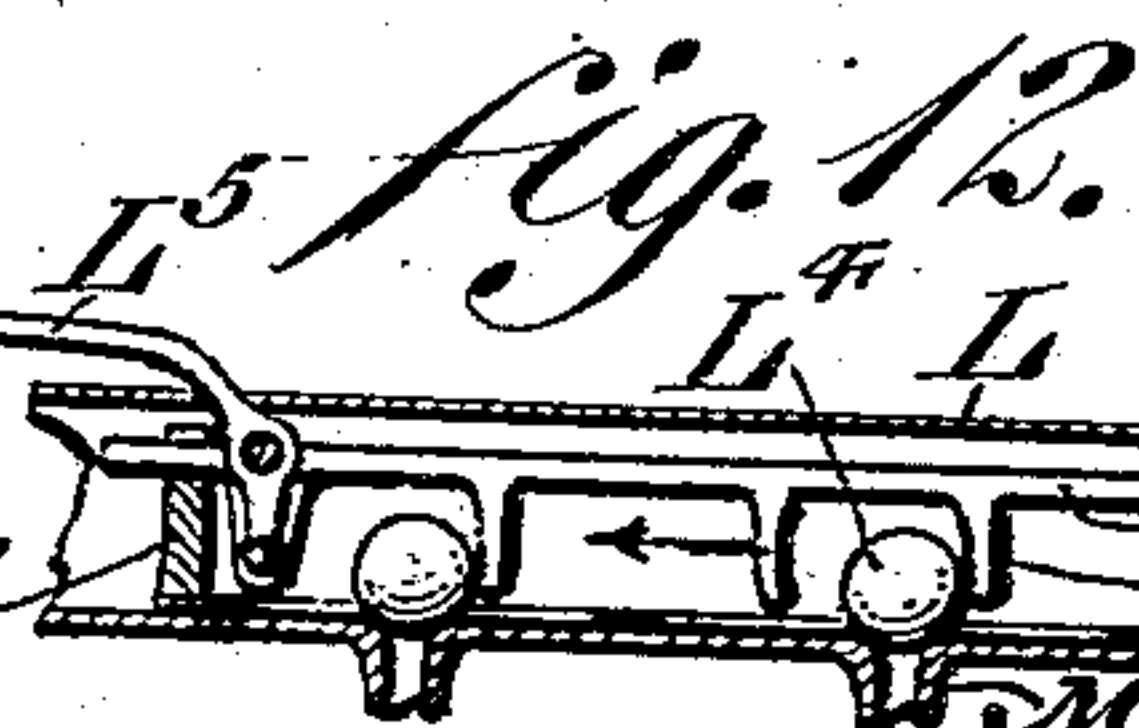


fig. 8.



Witnesses

L. Rouville,
P. F. Nagle,



Inventors
Thomas Baines Sr.
Edmond Leo Baines.

By *Diederheim & Fairbank*

Attorneys

UNITED STATES PATENT OFFICE.

THOMAS BAINES, SR., AND EDMOND LEO BAINES, OF PHILADELPHIA, PENNSYLVANIA;
SAID EDMOND LEO BAINES ASSIGNOR TO SAID THOMAS BAINES, SR.

MACHINE FOR FILLING BOTTLES OR OTHER RECEPTACLES.

No. 915,725.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed December 28, 1907. Serial No. 408,391.

To all whom it may concern:

Be it known that we, THOMAS BAINES, SR., and EDMOND LEO BAINES, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Machine for Filling Bottles or other Receptacles, of which the following is a specification.

Our invention consists of a machine adapted to fill bottles or other receptacles, in which the quantity of fluid directed thereinto is predetermined by a given weight of the fluid, and thus the receptacles are uniformly filled.

It also consists of novel means for advancing or feeding empty bottles or receptacles to the place where the same are to be filled.

It further consists of means for adapting the machine to fill a plurality of rows of bottles or other receptacles, or a single row thereof.

It also consists of details of construction, as will be hereinafter described and claimed.

For the purpose of explaining our invention, the accompanying drawings illustrate a satisfactory reduction of the same to practice, but the important instrumentalities thereof may be varied, and so it is to be understood that the invention is not limited to the specific arrangement and organization shown and described.

Figures 1 and 2 represent partial side elevations and partial vertical sections, at a right angle to each other, of the filling machine embodying our invention. Fig. 3 represents a top view of a detached portion. Fig. 4 represents a top view of another detached portion. Fig. 5 represents a vertical section of a detached portion. Fig. 6 represents a side elevation of a portion of the feeding device employed. Figs. 7 and 8 represent plan views of detached portions. Figs. 9, 10 and 11 represent plan views of carriers adapted for bottles or receptacles of different sizes. Fig. 12 represents a perspective view of a form of valve construction which may be employed.

Similar characters of reference indicate corresponding parts in the figures.

Referring to the drawings:—A designates a tank or reservoir adapted to contain fluid to be supplied to bottles A' to be filled. On the sides of said tank are racks B, with which

mesh the pinions C, whose shafts D are geared together, so as to be simultaneously operated, one of said shafts having a suitable crank handle E, whereby the tank may be conveniently raised and lowered, so as to be adjusted for purposes to be hereinafter described.

The tank has a plurality of outlets as at F, G, with the walls of which are connected the discharge pipes H, J, the latter being connected with the distributing pipes K, L, from which depend a series of nozzles M, N, respectively, which are so disposed as to be placed in communication with bottles below them, said bottles being supported in rows in a tray or carrier P, which is slidingly mounted on the frame of the machine, said frame being also adapted to form the bearings of the shafts D. The nozzles M are provided with rotary valves or cocks Q, with which are pivotally connected the links R, the latter being similarly connected with the follower S, from which rises the yoke T, with which the lever U is adapted to engage, so as to raise the same, and consequently the follower S and links R, whereby the valves or cocks Q will be opened and the liquid of the tank A directed into the bottles beneath the nozzles M, N.

V designates a beam, which is mounted on a suitable bearing such as V' pendent from the adjacent rack B, and has depending from its ends the pans W, W', after the manner of a scale or balance. The pan W is located below one of the nozzles N, and is adapted to support a vessel W², while the other pan W' is adapted to sustain a weight W³, it now being noticed that the vessel W² is adapted to receive a given weight of fluid, which being accomplished, said pan W' is caused to lower, for a purpose to be hereinafter described.

One end of the beam V has an adjusting device V² thereon, and the other end is movably connected by the slot V³ with a limb V⁴ extending from a head X, which latter is slidingly mounted on a guide X' connected with the frame of the machine, said head having arms X² extending laterally therefrom, so as to overhang levers X³, which are connected with the cocks of the adjacent nozzles of the front and rear row thereof, it now being noticed that when the vessel W² receives the charge of liquid of predetermined weight and so lowers the pan W, the

corresponding end of the beam V is also lowered, and as said end bears upon the stem or limb V^4 of the head X, the latter is likewise lowered, whereby as the arms X^2 thereof follow the same, the levers X^3 are depressed, thus turning the cocks to which they are attached. The links R of said cocks are thus turned, which is in downward direction, whereby said cocks are closed, and as said links are connected with the followers S, the latter are lowered, and thus the other links are also lowered and the connected cocks closed, the supply of liquid to the vessel W^2 and the bottles A' thus being cut off.

Each arm X^2 is formed of members pivotally connected with each other, see Fig. 3, so that either arm may be placed out of service when it is desired to fill but one row of bottles. In this case, the pan W may be removed from the position shown in Fig. 2 to the end of the beam V, for which purpose, the latter has a stud or button V^5 , from which said pan may be conveniently suspended, as most clearly shown in Fig. 3. In this event, it will be necessary to close either of the outlets F, G of the tank A. For this purpose, I provide the valve Y for the outlet G and a valve Z for the outlet F, see Fig. 5.

The valve Y is connected with the stem Y' , which is guided by suitable means in the tank A, and provided with a tooth Y^2 adapted to engage the wall of the eye Y^3 , which is secured to the tank, so as to hold the valve in elevated position. When said tooth Y^2 is released from said eye, the valve is lowered owing to the action of the spring Y^4 , which bears downwardly upon the stem Y' .

The valve Z is connected with the rocking stem Z' , whose axis is within the tank A, and whose upper end carries the tooth Z^2 , which may be engaged with the wall of the eye Z^3 , which is adjacent to the eye Y^3 , so as to hold said valve Z in closed position. When the tooth Z^2 is released, the stem Z' is subjected to the action of a suitable spring Z^4 , whereby the valve Z is held in open position.

The underside of the tray P has ratchet teeth P' thereon at intervals in the direction of the length thereof, the same being adapted to be engaged by the dog Z^x and the pawl Z^{xx} , which parts are mounted closely to each other, as in Figs. 2 and 6. The shaft of the pawl Z^{xx} has connected with it the spring-pressed treadle or foot lever Z^5 , which is adapted to engage a pin or stud Z^6 , on the lower limb of the dog Z^x , said limb being weighted to cause an elevation of the upper limb thereof. The tray P has connected with it the cord or chain P^2 , which passes around a suitable pulley and has a suitable weight P^3 on the end thereof, said weight being adapted to advance said tray limited by the dog and pawl aforesaid.

When the lever Z^5 is depressed, the pawl

Z^{xx} is removed from the tooth on the tray, with which it was engaged. The upper limb of the dog Z^x then rises and engages with the adjacent tooth, and so temporarily controls the tray, while the tooth with which the pawl was engaged fully clears the latter. The treadle is let-go, when the dog is removed from its tooth on the tray and the tray advances, but the detent quickly rises and engages with the tooth in its path, and so fully stops the tray, placing it in position to cause the next rows of bottles to be filled to be located under the respective nozzles.

When the tank A is adjusted in height, the shafts D are prevented from moving, by the action of a ratchet D' , which is keyed or otherwise secured to the shaft that carries the crank handle E, and a pawl D^2 , which is mounted on the frame of the machine and adapted to engage the teeth of said ratchet, the effect of which is evident on reference to Figs. 5 and 7.

The operation is as follows:—The tank A having been filled with the fluid, it is raised or lowered by proper manipulation of the handle E to the desired position in order to properly present the nozzles M and N to the bottles, it being understood that in this manner it is adapted for the use of any size bottles and the nozzles can be placed in proper position therefor. The tray P is supplied with the necessary bottles A' and the first two rows, for example, are placed beneath the nozzles M and N, the said tray P being held by the pawl Z^{xx} in its proper place. The lever U is now properly actuated by pressure so that it will raise the yoke T and with it the followers S and the links R so that the valves or cocks are opened, the liquid or fluid from the tank A passing from the said nozzles M and N into the bottles. As the vessel W^2 is beneath one of the nozzles, in the present instance, one of the nozzles N, see Fig. 2, it will also receive a discharge of fluid and when the weight of said fluid is greater than the weight W^3 , the vessel W^2 and pan W will be lowered, thus actuating the beam V, and this will lower the end of said beam with which the head X is connected thus lowering said head and causing the arms X^2 to contact with the levers X^3 which are connected with the valves or cocks of the two end nozzles M and N. This will actuate said levers X^3 , rotating the valves and carrying down the followers S which in operation will lower all of the links R, thus rotating the valves with which said links are connected so that the nozzles are closed. It will be seen from the above that a predetermined amount of fluid can thus be supplied to the bottles, the amount being regulated by weight, since it is evident that the beam V can be adjusted to balance the weight of the vessel W^2 with respect to the pan W^1 by

proper manipulation of the weight V^2 and that when the weight W^3 is placed upon the pan W^1 the amount of fluid fed or discharged into the bottles is determined and regulated.

5 The fluid which has been discharged into the vessel W^2 can now be returned to the tank A^1 by hand and the weight W^3 will return the beam V and its connected parts ready for the next operation. The operator now
10 depresses the treadle Z^5 removing the pawl Z^{xx} from engagement with one of the dogs P^1 of the tray, but causing the dog Z^x to engage with one of the teeth, it being seen that this can be accomplished since the lower end
15 of said dog is weighted and is normally supported by the treadle Z^5 and when said treadle is depressed the dog Z^x is permitted to rotate and the upper end thereof is caused to engage with one of the dogs P^1 .

20 When the operator releases the treadle Z^5 it raises the lower end of the dog Z^x removing the same from engagement with the dog P^1 and the weight P^3 acting upon the tray P^3 moves the same forwardly until the pawl Z^{xx} ,
25 which meanwhile has been raised with the treadle Z^5 , engages with the next succeeding pawl, this movement being so arranged that the next set of bottles are placed in position beneath the nozzles M and N for filling.
30 When it is desired to employ but one series of nozzles, as for example M , by releasing the tooth Y^2 from engagement with the eye Y^3 , the spring Y^4 lowers the valve Y and closes the outlet F , so that no fluid can pass there-
35 through. If it is desired, however, to close the other series of nozzles, as N , by releasing the tooth Z^2 from engagement with the eye Z^3 , the spring Z^4 forces in the valve X closing the outlet G so that no fluid can pass there-
40 through. If it is desired to close both of the nozzles for any purpose the same operation as above described can be employed.

It will of course be understood that any desired number of nozzles with correspond-
45 ing connection to the tank may be employed and that any number of bottles in series may be filled, it only being necessary to adjust the parts therefor.

In Fig. 12 we have shown a ball valve con-
50 struction, the same being mounted in the distributing pipes in this instance in the pipe L and consists of a frame L^1 in which is movably supported the bar or rod L^2 having the lugs or teeth L^3 thereon and between which
55 are situated the ball valves L^4 , the same being adapted to be moved to close or open the discharge nozzles M , depending upon the position of bar L^2 . The movement of this latter bar is accomplished by a lever L^5 which is
60 similar to lever X^3 which is so connected that when it is elevated by the operator the bar L^2 is moved in the direction indicated by the arrow, removing the balls from the discharge nozzles and permitting flow of the liquid or

fluid therethrough. When the head X de- 65 scends it strikes the lever L^3 depressing the same and moving the balls L^4 in proper position for closing the nozzles. This construction is particularly adapted for use on heavy substances which would not flow readily 70 through the valves previously described, such materials or substances being for example, tomato catsup, molasses and oils.

In order to provide for a positive flow from the nozzles through the discharge pipe L , we 75 have provided the tubes $B'-B'$ which communicate with the opposite ends of the discharge pipe L , said tubes B' being open at their upper ends. By these means we prevent a vacuum from being formed in the discharge 80 pipe and at the same time when the nozzles M are opened the air from the pipes $B'-B'$ forces the liquid uniformly from the pipe L through all the nozzles M into the bottles, causing all the same to be filled with an equal 85 amount of the fluid. It will of course be understood that we provide similar tubes to any of the discharge pipes and we have shown pipes B^2-B^2 in Fig. 2 as connected with the discharge pipe K . 90

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, a tank adapted to contain fluid, nozzles in 95 communication therewith, valves controlling said nozzles, means for operating said valves, whereby said nozzles are opened, and a primary weighing device independent of the vessels to be filled, the same being actuated 100 by the flow of the fluid from said tank for automatically and simultaneously closing all of said nozzles.

2. In a device of the character described, a tank adapted to contain fluid, nozzles in 105 communication therewith, valves controlling said nozzles, means for opening all of said nozzles, and a balancing device adapted to receive the discharge from one nozzle and to automatically operate the valves to close 110 all of the nozzles when a predetermined amount of fluid has passed into the balancing device.

3. In a device of the character described, a tank adapted to contain fluid, nozzles in 115 communication therewith, valves controlling said nozzles, a follower in suitable connection with said valves, a lever for operating said follower whereby said valves are opened, and a balancing device adapted to receive the 120 discharge from one nozzle and to automatically operate to close all of the nozzles when a predetermined amount of fluid has passed into the balancing device.

4. In a device of the character described, 125 a tank adapted to contain fluid, a series of nozzles in communication therewith, valves controlling said nozzles, means for operating

all of said valves whereby said nozzles are opened, a beam suitably supported and carrying a weight upon one end, means carried by the opposite end of said beam adapted to receive liquid from one of said nozzles, and a connection between said beam and said valves whereby when the beam is actuated the valves are closed.

5. In a device of the character described, a tank adapted to contain fluid, nozzles in communication with said tank, valves controlling said nozzles, means connected with said valves and adapted to be actuated to open the same, a beam suitably supported and carrying a weight upon one side of its fulcrum, means connected with said beam upon the other side of the fulcrum adapted to receive fluid from one of the nozzles, and means actuated by said beam for operating the valves to close the same, whereby the supply is automatically controlled by the amount of fluid passing from one of the nozzles.

6. In a device of the character described, a tank adapted to contain fluid, means for raising and lowering said tank whereby the same is adjusted for various sized bottles, nozzles communicating with said tank, valves for controlling each of said nozzles, a follower in suitable connection with said valves and adapted to be actuated to open the same, a beam pivotally supported, a weight carried by said beam upon one side of the fulcrum, means carried by said beam upon the opposite side of the fulcrum adapted to receive fluid from one of said nozzles, and adjustable means carried by said beam and adapted to assist in actuating said follower, whereby the valves are closed.

7. In a device of the character described, a tank adapted to contain fluid, means for raising and lowering said tank whereby the same is adjusted for various sized bottles, nozzles communicating with said tank, valves for controlling each of said nozzles, a follower in suitable connection with said valves and adapted to be actuated to open the same, a beam pivotally supported, a weight carried by said beam upon one side of the fulcrum, means carried by said beam upon the opposite side of said fulcrum adapted to receive fluid from one of said nozzles, adjustable means carried by said beam and adapted to assist in actuating said follower whereby the valves are closed, and means for properly locating the bottles beneath the nozzles.

8. In a device of the character described, a tank adapted to contain fluid, means for raising and lowering the tank whereby the same is adjusted for various sized bottles, nozzles communicating with said tank, valves for controlling each of said nozzles, a

follower in suitable connection with said valves and adapted to be actuated to open the same, a beam pivotally supported, a weight carried by said beam upon one side of the fulcrum, means carried by said beam upon the opposite side of said fulcrum adapted to receive fluid from one of said nozzles, adjustable means carried by said beam and adapted to assist in actuating said follower, whereby the valves are closed, a sliding tray, and means for controlling said tray and for actuating the same, whereby the bottles are placed in proper position beneath the nozzles.

9. A bottle filling device having a supply tank with discharge valves, and a vessel independent of the bottle to be filled, said vessel being carried by a scale beam and adapted to receive from said tank a predetermined weight of fluid, and means for connecting the carrier of said vessel with said valves, whereby on the descent of said vessel, when properly supplied, the several valves are adapted to be closed.

10. In a device of the character described, a tank adapted to receive fluid, nozzles communicating therewith, valves controlling said nozzles, means for actuating all of said valves to open the same, a beam suitably supported, means for supporting a weight on said beam upon one side of the fulcrum thereof, means for supporting a suitable vessel on said beam on the opposite side of said fulcrum and beneath one of the nozzles, an arm actuated by said beam and adapted to be lowered therewith and to contact with the actuating means and to so move the same as to close the valves of said nozzles.

11. In a device of the character described, a tank adapted to contain fluid, nozzles in communication therewith, valves controlling said nozzles, means for operating all of said valves for opening the same and means actuated by a predetermined amount of fluid flowing from one of the nozzles for automatically closing all of said nozzles.

12. In a device of the character described, a tank adapted to contain fluid, nozzles in communication therewith, valves controlling said nozzles, means for operating said valves whereby all of the valves are opened and a balancing device adapted to be actuated by a predetermined amount of fluid flowing from one of said nozzles for closing all of said valves.

13. In a device of the character described, a tank adapted to contain fluid, a discharge pipe communicating therewith, nozzles carried by said discharge pipe, means for preventing a vacuum in said discharge pipe and for forcing the fluid therefrom, valves controlling said nozzles, means for operating said valves, whereby all of the nozzles are opened and means controlled by a predeter-

mined amount of fluid flowing from one of said nozzles for automatically closing all of the same.

14. In a bottle filling device, a tank, discharge valves in communication therewith, a weighing vessel adapted to be supplied from one of said valves independent of the valves for supplying bottles, and means for communicating the descending motion of said

vessel, when containing a predetermined quantity of fluid, to all of said valves to close the same.

THOMAS BAINES, SR.
EDMOND LEO BAINES.

Witnesses:

C. D. McVAY,
E. C. GEYER.