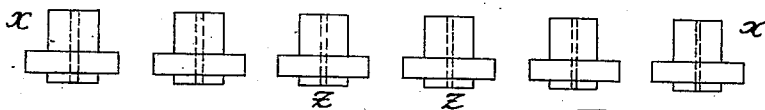
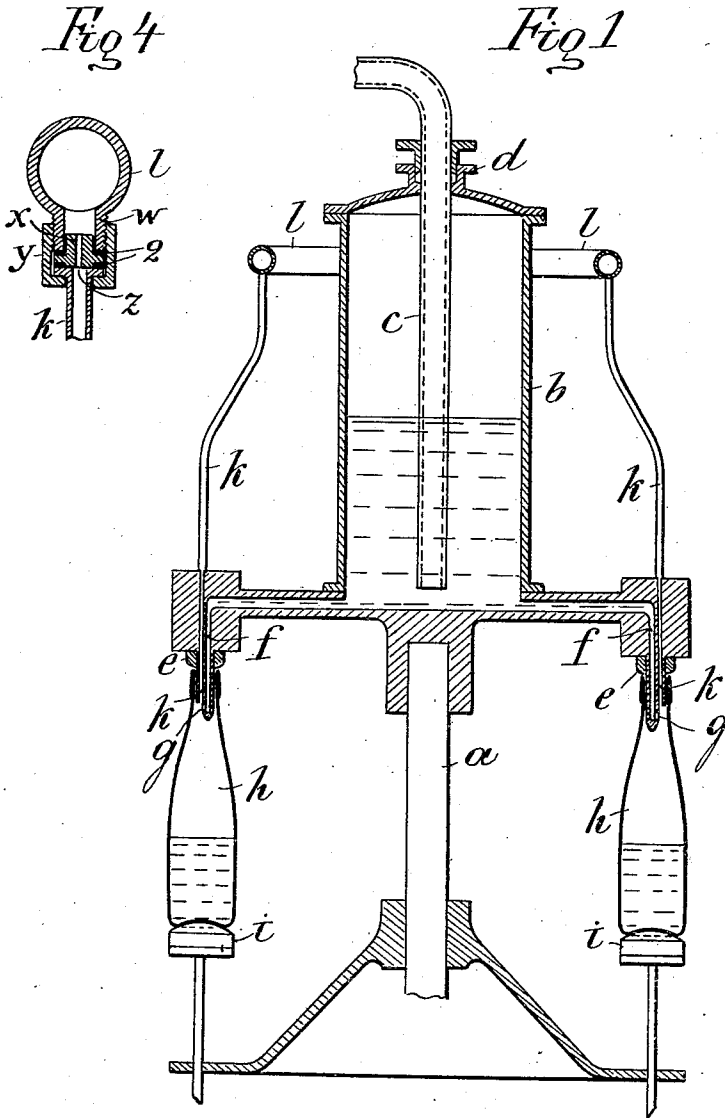


A. A. PINDSTOFTE.
 ROTARY BOTTLING MACHINE.
 APPLICATION FILED OCT. 17, 1907.

935,685.

Patented Oct. 5, 1909.

2 SHEETS—SHEET 1.



Witnesses
 L. Flynn
 P. T. Louch

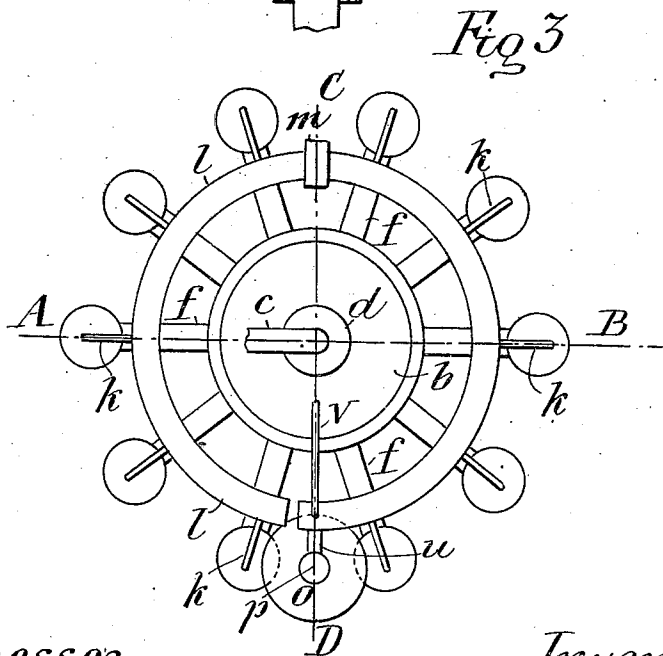
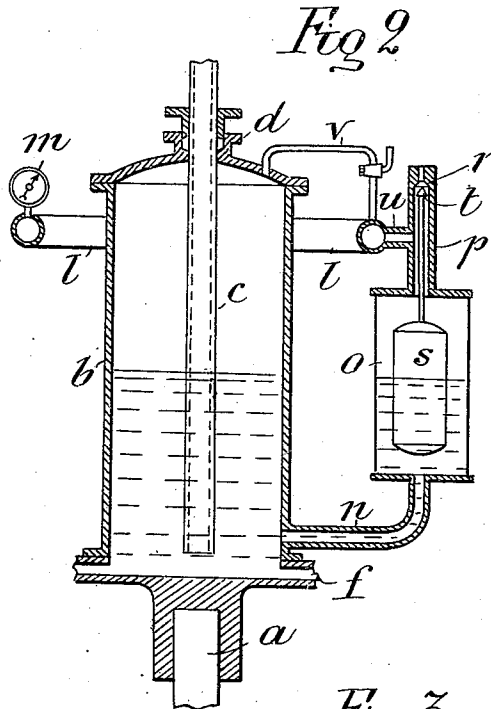
Fig. 5.

Inventor
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 By *[Signature]*
[Signature]

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 2 SHEETS—SHEET 2.



Witnesses
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Inventor
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 By *[Signature]*

UNITED STATES PATENT OFFICE.

ANDERS ANDERSEN PINDSTOFTE, OF FREDERIKSBERG, NEAR COPENHAGEN, DENMARK.

ROTARY BOTTLING-MACHINE.

935,685.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed October 17, 1907. Serial No. 397,764.

To all whom it may concern:

Be it known that I, ANDERS ANDERSEN PINDSTOFTE, a subject of Denmark, and residing at No. 62 Frederiksberg Alle, in the city of Frederiksberg, near Copenhagen, and Kingdom of Denmark, have invented new and useful Improvements in and Relating to Rotary Bottling-Machines, of which the following is a specification.

The invention relates to improvements in devices for bottling liquid under counter-pressure upon bottles or the like in which the liquid is introduced into a closed liquid-reservoir from which it flows down through bottling pipes into the bottles while the air expelled from the bottles can escape through a discharge valve controlled by a float.

The main object of my invention is to arrange said discharge valve in such a manner that variations in the counter pressure during the filling of the bottles are practically prevented and that consequently the bottling operation always takes place in the same manner. For this purpose the float controlling the discharge valve is contained into a special small reservoir arranged beside the liquid reservoir and having its upper part in free communication with an air reservoir connected with the air-pipes leading from the bottles while its lower part is in free communication with the lower part of the liquid reservoir through a tube, so that normally, it is when the counter-pressure equilibrates the pressure in the liquid reservoir, the pressure on the liquid in the two reservoirs is the same and the float-controlling liquid contained in the small reservoir is at the same level as the liquid in the large reservoir. If however in any of the two reservoirs the pressure increases or falls the liquids are moved up or down, but of course the rate of the up- or downward movement of the liquid in the small reservoir will be many times greater than that of the liquid in the large reservoir. Consequently the sensibility of the discharge valve will be increased proportional to the proportion between the surface areas of the liquids in the two reservoirs so that an automatic and practically instantaneous blowing out of the air expelled from the bottles and superfluous for the maintaining of a counter pressure equal to the pressure in the liquid reservoir is effected, without allowing said expelled air to come into contact with the liquid which flows into the liquid-reservoir, as said liquid is sepa-

rated from the expelled air by the small quantity of liquid contained in the small reservoir and acting as a constant liquid-piston which moves up and down in said reservoir.

Further, the invention includes means whereby not only the air-escape from the bottles can be regulated in such a manner that formation of froth is prevented, but also the velocity with which the air flows into the bottles is regulated so that a too sudden establishment of the counter-pressure in the bottles and thereby breakage of the bottles is prevented.

An embodiment of the invention is illustrated in the accompanying drawings, in which—

Figures 1 and 2 represent two vertical sections on the line A—B and C—D of Fig. 3 respectively. Fig. 3 is a top view of the machine. Fig. 4 is a section through a detail on a larger scale, and Fig. 5 shows in an enlarged scale a series of regulating plates.

In the drawings *a* is the shaft on which the machine rotates, *b* is the liquid reservoir to which the liquid is supplied from the storage reservoir through a pipe *c* which is carried into the liquid reservoir through a stuffing box *d*.

The liquid reservoir is provided at its bottom with a number of bottling pipes *f*, each provided with a mouthpiece *e* and closed below and formed, in proximity to its extremity, with a lateral orifice *g* through which the liquid flows into the bottle *h* applied to the tube and supported on the table *i* and pressed upward against the mouthpiece. Beside each of these bottling tubes *f*, an air discharge pipe *k* is arranged which also opens through the mouthpiece *e* into the neck of the bottle. Each pair of bottling tubes *f* and air discharge tubes *k* is controlled in a known manner by a common cock (not shown) having an air- and a liquid-passage. All these pipes *k* open above into a common air discharge passage *l* arranged outside the liquid reservoir. The passage *l* is provided with a discharge valve controlled by the level of the liquid in the liquid-reservoir, as will now be explained, and said passage may also be furnished with a pressure gage *m*.

The arrangement of the discharge valve shall now be described. The liquid reservoir *b* communicates through a tube *n* near

its bottom with a small reservoir *o* which is in free communication at its top with the air discharge passage *l*. The liquid in the small reservoir *o* will consequently normally, that is when the counter pressure equilibrates the pressure in the liquid reservoir, keep level with the liquid in the liquid-reservoir *b*, and the rate of its up- and downward movement will, if the pressure in any of the two reservoirs increase or falls be increased proportional to the proportion between the surface areas of the liquids in the two reservoirs *b* and *o*. Leading from the upper end of the reservoir *o* is a tube *p* at the upper end of which a valve seat *r* is provided for the air exhaust. In the example here illustrated this valve is a cone valve *t* which is carried by the float *s* in the reservoir *o*. The discharge passage *l* communicates with the tube *p* through a tube *u* so that the air expelled from the bottles is able to escape through the exhaust valve into the atmosphere without coming into contact with the liquid flowing into the liquid reservoir.

The liquid reservoir *b* communicates at its upper end with the discharge passage *l* through a tube *v* provided with a hand cock, so that the air expelled from the reservoir when first charging it with liquid can be discharged. The cock may if desired be kept open during the whole bottling process.

As mentioned the bottling-machine may be provided with means whereby not only the air-escape from the bottles can be regulated in such a manner that a constant counter-pressure is maintained and thereby formation of froth during the filling of the bottles is prevented, but also the velocity with which the air flows into the bottles is regulated in such a manner that a too sudden establishment of the counter-pressure in the bottles and thereby breakage of the bottles is prevented. One form of such means is shown in Fig. 4, in which the air-discharge pipes *k* are not in direct communication with the air discharge passage *l* but are connected therewith by screw connections *v*, one of which is screwed on to one of the tubular sockets *w* of the air discharge passage *l* for each air discharge pipe *k*. Between the ends of the tubular socket *w* and of the air discharge pipe *k*, a regulating plate *x* with one or more perforations *z* is provided, the annular edge of this plate being surrounded by packing washers *2* so that a completely air tight connection is obtained when the screw connection is tightened.

Each bottling machine is provided with a number of sets of regulating plates (see Fig. 5) corresponding to the number of bottling pipes; these sets are furnished with perforations of different diameters say 1 mm., 1,1 mm., 1,2 mm. and so forth, so that upon unscrewing the screw connection and inserting a different regulating plate the velocity

with which the air is discharged from or introduced into the bottles may be adapted to each particular case, so that not only the bottling can be effected without the formation of froth, but also a too sudden establishment of the counter-pressure in the bottles and thereby breakage of the bottles is prevented.

Claims.

1. In a device for bottling liquid under counter-pressure, the combination with a closed liquid reservoir having liquid supply and bottling pipes, a number of air-discharge pipes leading from the bottles to an air reservoir arranged outside the liquid reservoir and provided with a discharge valve, of a small reservoir *o* arranged beside the liquid reservoir and having its upper part in free communication with said air-reservoir and its lower part in free communication with the lower part of the liquid reservoir through a pipe *n*, and a float contained in said small reservoir and controlling the discharge valve of the air-reservoir; substantially as and for the purpose set forth.

2. In a device for bottling liquid under counter-pressure, the combination with a closed liquid reservoir having liquid supply and a number of bottling-pipes, a number of air-discharge pipes leading from the bottles to an air-reservoir arranged outside the liquid-reservoir and provided with a discharge valve, of a small reservoir *o* arranged beside the liquid-reservoir and having its upper part in free communication with the air-reservoir and its lower part through a pipe *n* with the lower part of the liquid reservoir, a float contained in said small reservoir *o* and controlling the discharge valve of the air-reservoir, and a tube *v* with valve or the like connecting the upper part of the liquid reservoir with the upper part of the small reservoir *o*; substantially as and for the purpose set forth.

3. In a device for bottling liquid under counter pressure, the combination with a rotary closed liquid reservoir having liquid supply and a number of bottling-pipes, a number of air-discharge pipes leading from the bottles and connected with a ring-shaped air-reservoir arranged outside and rotating with the liquid-reservoir and provided with a discharge-valve, of a small reservoir *o* arranged beside and rotating with the liquid-reservoir and having its upper part in free communication with the air-reservoir and its lower part in free communication with the lower part of the liquid-reservoir through a pipe *n*, and a float contained in said small reservoir *o* and controlling the discharge-valve of the air-reservoir; substantially as and for the purpose set forth.

4. In a device for bottling liquid under counter-pressure, the combination with a

closed liquid reservoir having liquid supply
and a number of bottling-pipes, a number
of air-discharge pipes leading from the bot-
tles to an air reservoir arranged outside the
5 liquid reservoir and provided with a dis-
charge valve, of a small reservoir *o* arranged
beside the liquid reservoir and having its
upper part in free communication with the
air-reservoir and its lower part through a
10 pipe *n* with the lower part of the liquid-
reservoir, a float contained in said small res-
ervoir *o* and controlling the discharge valve
of the air reservoir, and interchangeable per-

forated flow-of-air regulating plates inserted
between the air-reservoir and the discharge 15
end of the air-discharge pipes; substantially
as and for the purpose set forth.

In testimony whereof, I have signed my
name to this specification in the presence of
two subscribing witnesses, this second day of 20
October 1907.

ANDERS ANDERSEN PINDSTOFTE.

Witnesses:

MARCUS MOLLER,
G. ROTKJAR.