No. 766,433. PATENTED AUG. 2, 1904.

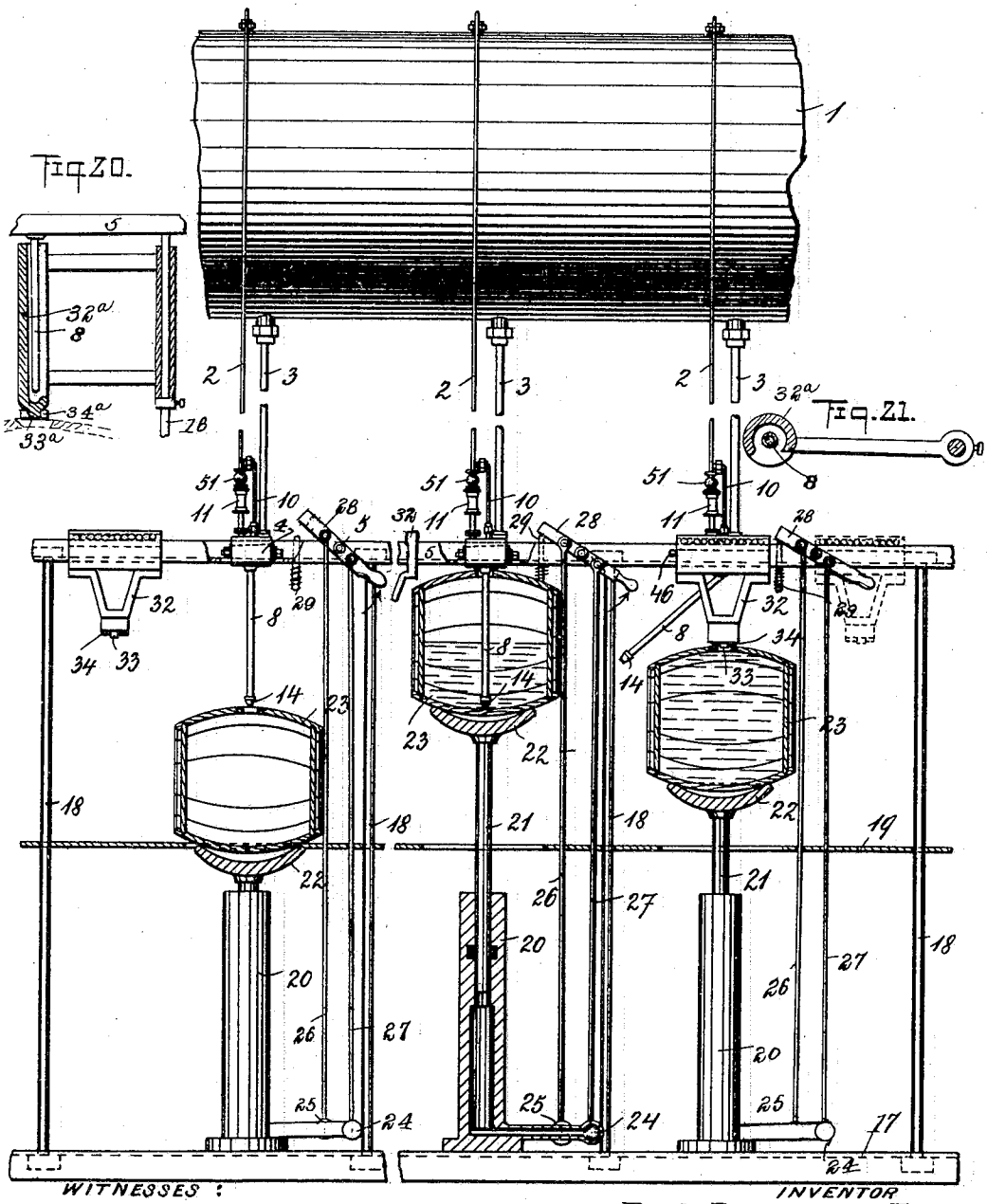
A. B. VON ECHT.

APPARATUS FOR FILLING CASKS OR LIKE VESSELS WITH LIQUIDS.

APPLICATION FILED FEB. 25, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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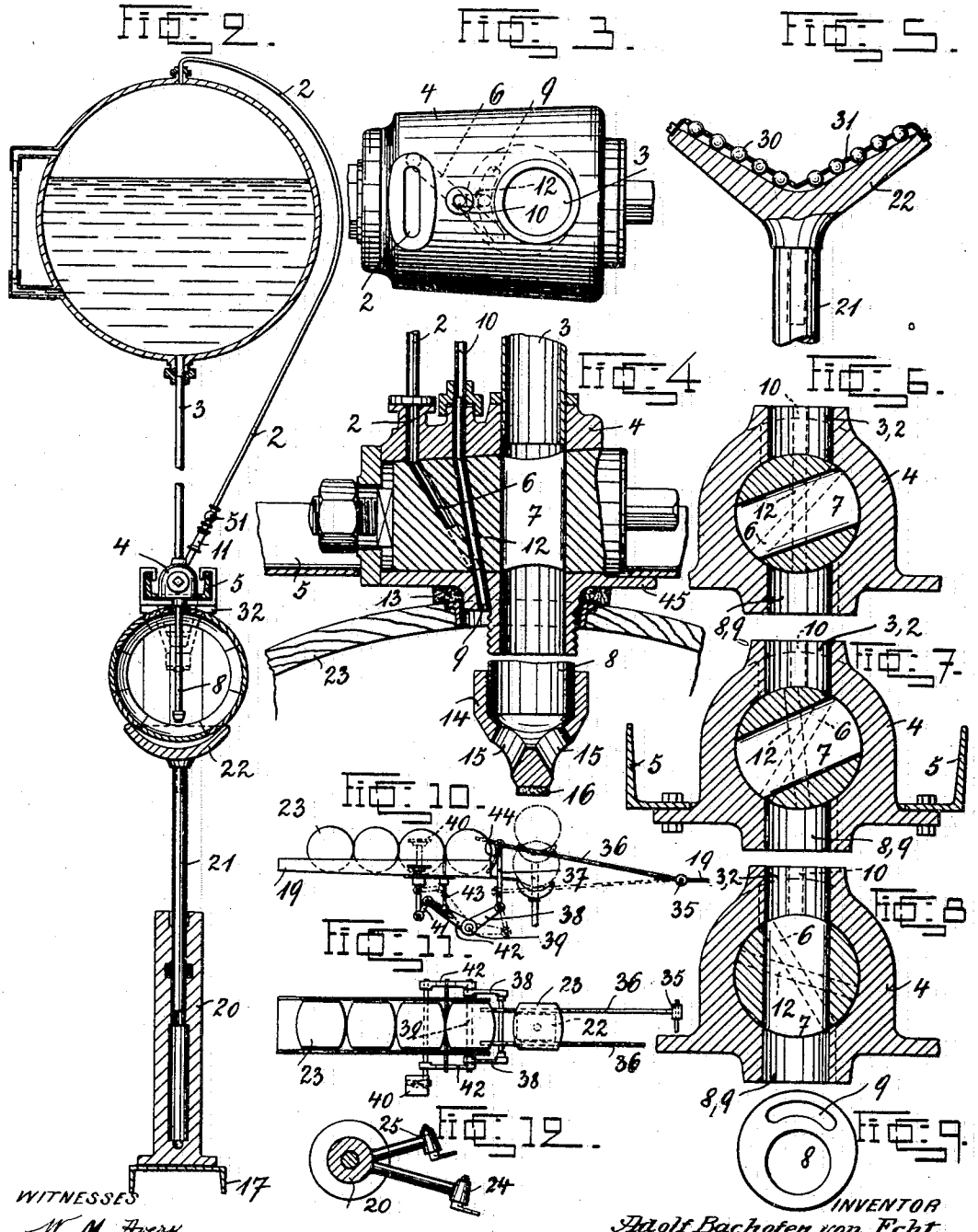
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NO MODEL. 3 SHEETS—SHEET 2.



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APPLICATION FILED FEB. 25, 1904.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 13.

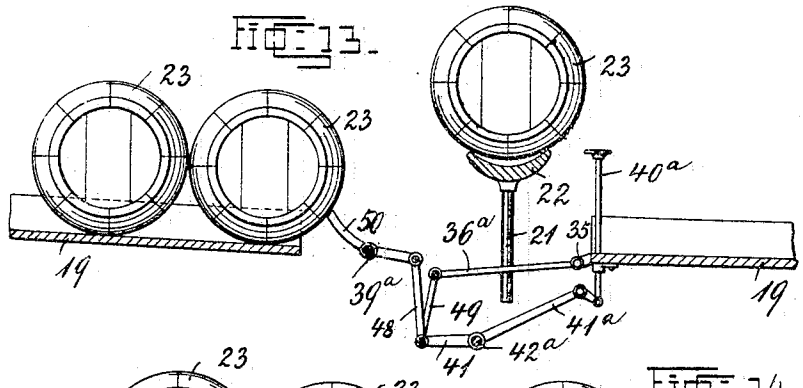


Fig. 14.

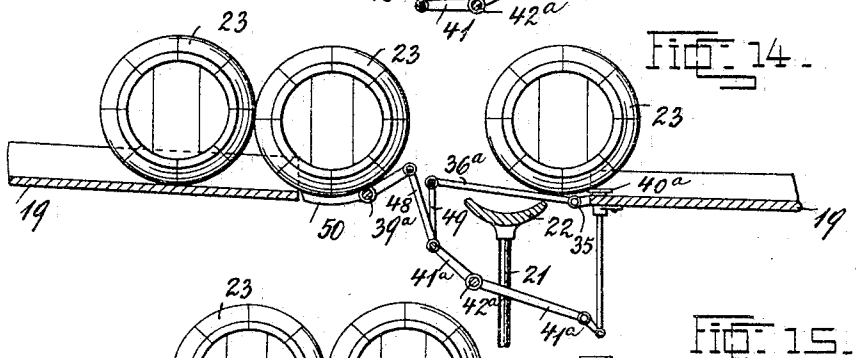


Fig. 15.

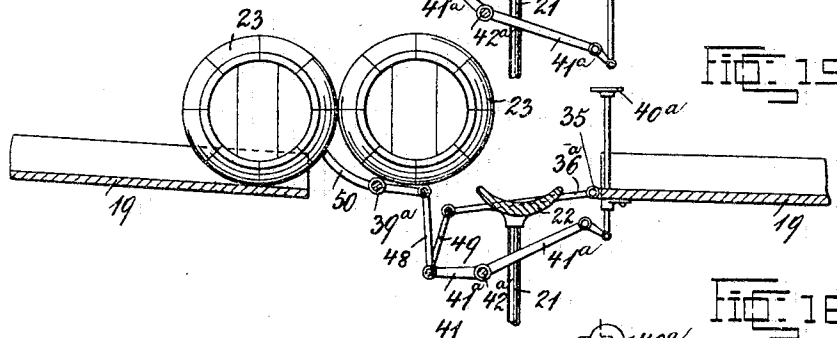
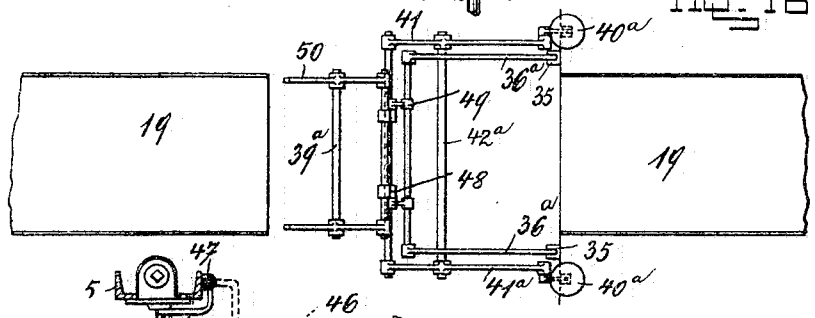


Fig. 16.



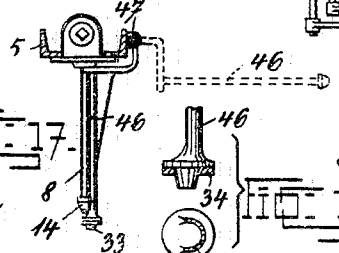


Fig. 17.

Fig. 18.

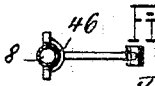


Fig. 19.

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No. 766,433. Patented August 2, 1904.

UNITED STATES PATENT OFFICE.

ADOLF BACHOFEN VON ECHT, OF VIENNA, AUSTRIA-HUNGARY.

APPARATUS FOR FILLING CASKS OR LIKE VESSELS WITH LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 766,433, dated August 2, 1904.

Application filed February 25, 1904. Serial No. 195,187. (No model.)

To all whom it may concern:

Be it known that I, ADOLF BACHOFEN VON ECHT, a subject of the Emperor of Austria-Hungary, residing at Vienna, Austria-Hungary, have invented certain new and useful Improvements in and Relating to Apparatus for Filling Casks or Like Vessels with Liquids, of which the following is a specification.

The process heretofore usually employed for filling casks and other vessels of any desired size with foaming liquids, more especially beer, from a tank or other receptacle consists in that the cask or other vessel placed on a support is brought into communication with a system of filling-pipes (which can be raised and lowered and which is arranged on the tank or other receptacle) by lowering the said system of pipes and is then filled, whereupon the said system of pipes is raised and the cask or other vessel is closed by driving in a bung or the like by hand. This process is not only complicated and slow in itself, but requires very complicated apparatus for carrying it into practice.

The subject of the present invention is an apparatus for filling casks and like vessels with foaming liquids, which apparatus is distinguished from that used in the process above mentioned by greater simplicity, certainty, and higher efficiency or output.

My improved apparatus consists of a system of filling-pipes which extends from the tank or other receptacle in the usual way, but is stationary and is provided with a common shut-off device, and also of a lifting arrangement for the cask or like vessel which for the purpose of enabling it to be filled with the liquid under consideration is raised and pressed tightly against the shut-off device by the said lifting arrangement, and, finally, of an abutment against which the filled cask or like vessel is pressed by the same lifting arrangement for the purpose of pressing in the bung.

In the accompanying drawings, Figure 1 shows the improved filling plant in front elevation, partly in vertical section; and Fig. 2 shows the same in transverse section. Figs. 3 to 19 show details, and Figs. 20 and 21 are detail views of a modified form of the abutment for pressing in the bung.

The foaming liquid for filling the casks or other vessels is contained in a closed tank 1 or other suitable receptacle, which is mounted on a frame (not shown) and in which the liquid is under a certain pressure, (about 0.2 to 0.5 atmosphere above the atmospheric pressure,) which is exerted thereon by the air, carbonic acid, or by a mixture of said gases in the space above the said liquid. From this tank at each filling-point there branches a system of filling-pipes, which consists of an air-pipe 2, extending from the air-space of the tank, and of a filling-pipe 3, which extends from the liquid-space and is stationary, thus differing from the arrangement heretofore usually employed. Each system of filling-pipes consequently consists of an air-pipe and a filling-pipe, since it is a fundamental condition in order to avoid the formation of foam in filling vessels with foaming liquids that there must be the same pressure in the tank and in the cask, and this is attained by opening the air-pipe 2 before the filling takes place. In order to enable these operations to be performed exactly and rapidly, each system of filling-pipes 2 3 is connected to a cock 4, Figs. 1 to 4, which is secured, for example, to a U-shaped bar 5. Since by my improved process as rapid a filling of the cask as is possible should be attained, the cross-section of the filling-pipe 3 is made very large in comparison with that of the air-pipe 2, and the two cross-sections together have nearly the size of cross-section of the bung-hole of the cask. As a continuation of the pipes 2 3 the plug of the cock has two passages 6 7, of which one, 7, is continued in a filling-pipe 8, depending from the shell of the cock, and the second, 6, in a passage 9 in the casing or shell of the cock, Fig. 9. For a purpose to be explained later a second air-pipe 10, Figs. 1 and 4, is provided, which is connected with the first air-pipe 2 at a suitable height above the cock and preferably above a gage-glass 11, Figs. 1 and 2, in the first air-pipe and which can be put into communication with a passage 12 in the plug, which passage unites with one of the passages 6 or 9. The cock is completed by a packing-ring or piece 13, which permits a fluid-tight connection thereof with the cask or other

vessel when the latter is pressed tightly against the cock. The filling-pipe is weighted at its lower end with a cone, which is contracted downward, or with a cap 14 of a similar form. The cone or cap is provided either at the bottom or at the side with outlet-apertures 15, the total cross-section of which corresponds to the average cross-section of the pipe in order to avoid foaming of the liquid at this place also. Since the cone should extend to a point quite near to the bottom of the vessel, its front or end surface is covered with an elastic pad or piece 16 in order not to damage the layer of pitch on the inside of the cask.

The U-iron 5, to which the filling-cocks 4 are secured, is connected to a rail or base 17, bearing the hydraulic lifting arrangements by columns 18 and the like, whereby a cask-support 19, lying between, is relieved from pressure. Each lifting arrangement consists of a vertical hydraulic cylinder 20, the plunger 21 of which bears at its upper end a suitably-formed and preferably rotatably-arranged platen or saddle 22 for the reception of the cask or like vessel 23 to be filled. The hydraulic cylinder is provided with an inlet valve or cock 24 and an outlet-valve 25, Fig. 12, for controlling the movement of the water under pressure, each of which valves is connected, by a rod 26 27, Fig. 1, to a lever 28 (or hand-wheel) rotatably mounted on the U-iron 5, one end of which lever extends into the travel of a pin 29, which is normally pressed downward by a spring and which is arranged on the U-iron, which pin is adapted to be raised by the outer surface of the cask or like vessel or by an adjustable projection on the plunger 21. This arrangement serves, as will be described later, for the regulation of the inlet and outlet of the working fluid from the hydraulic cylinder and for the automatic retardation of the speed at which the cask is lifted. The platen 22 is preferably curved similarly to a calotte or cup in order to afford the necessary steadiness with casks or vessels of different size and to enable them to be turned in a simple manner, so that the bung-hole of each cask lies exactly over the cone 14 on the corresponding filling-tube 8. Fig. 5 shows one constructional form of the platen which permits easy centering of the cask or like vessel. This platen has a V shape in cross-section and is provided on its upper surface with rollers or preferably with balls 30, which, although they can turn in their places, yet are prevented from altering their position by means of perforated plates 31, which are arranged at such a distance from the platen that the rollers or balls extend outward through the openings in the plate and together form a support for the cask or vessel, which can accordingly be turned and moved with ease in order to center them.

For the purpose of pressing the bung into the bung-hole, which operation is likewise performed by the lifting arrangement, there is adjustably arranged on the U-iron 5 or on any other suitable guide a holder or abutment 32, which is provided with a presser 33 for the bung and, if desired, with an elastic packing-ring 34, which surrounds the presser 33 and, as explained later, serves for protecting the cask against direct pressure from the presser 33. The holder or abutment 32 is mounted to slide freely on the U-iron 5, and the part of the abutment engaging the under side of the U-iron has a longitudinal opening, so that the abutment can be brought into position without coming in contact with other parts of the apparatus. The holder or abutment can also be rotatable instead of being movable rectilinearly, in which case it is advisable to arrange it on the column 18, connected with U-iron 5, in a similar manner to the arrangement in boiler-riveting machines. This form of the abutment is shown in Figs. 20 and 21, the abutment 32^a being mounted on one of the columns 18, so that it can be swung toward or from the filling-pipe 8 and rigidly held in adjusted position on the column. The abutment 32^a is half round or semicircular in shape, so that it will partly surround the filling-pipe 8 when the abutment is in position to engage the bung.

The operation of the apparatus is as follows: The cask or vessel to be filled is arranged, by means of an apparatus to be described later, on the platen 22, centered, and then by turning the controlling-lever 28 in the direction of the arrow, Fig. 1, left-hand filling-point, the inlet-valve for the hydraulic lifting apparatus is opened. The fluid under pressure lifts the plunger 21, together with the cask, as quickly as possible until by the striking of the cask against the spring-pressed pin 29 shortly before the completion of the stroke the said pin is raised, and by this means the controlling-lever 28 is turned in a direction opposite to that indicated by the arrow, whereby the inlet-valve is throttled, and consequently a considerable retardation of the speed of lifting the cask is produced until finally the cask is pressed with a definite pressure against the packing-ring 13 and remains in this position. In this position the filling-pipe 8 has entered the cask, Fig. 1, middle filling-point. The cock 4 is now slowly opened, whereby the passage 12 is first uncovered to the passages 10 and 9, while the other passages 6 7 for the present remain closed. (See the position of the cock indicated in Fig. 6.) This is done for the following reasons: From the preceding filling there is liquid remaining in the first air-pipe 2, and from the presence of liquid in the gage-glass 11 the attendant has seen that the cask is full. Before again filling a cask this liquid must first enter the said cask. In order, however, to prevent the formation of foam in this operation, equilib-

rium of pressure is produced between the boiler and the cask by uncovering the passage 12. If the plug is turned farther into the position shown in Fig. 7, the passage 6 will be uncovered to the passages 2 and 9, and the liquid in the gage-glass 11 can run through the passage 9 along the filling-pipe 8 into the cask. The equilibrium of pressure between the cask and the tank now takes place mainly through the passage 6. If, finally, the cock is turned into the position indicated in Fig. 8, the passage 12 is shut off, the passage 6 remains open, and the main passage 7 is entirely uncovered, through which the filling of the cask takes place via the filling-pipe 3 from the tank to the cock and the flexible filling-pipe 8 below the cock. When the cask is full, the liquid rises through the passages 9 and 6 into the first air-pipe 2 and is visible in the gage-glass 11, at which moment the cock must be quickly closed by turning the plug farther. In order to prevent further rise of the liquid column in the first air-pipe 2, it is advisable to introduce a check-valve 51 therein between the branching-point of the second air-pipe 10 and the gage-glass 11, which valve closes under the pressure of the rising liquid. After the complete shutting off of the cock liquid remains in the passages 6 and 7 in the plug and partly in the first air-pipe 2, which only flows away in the manner above mentioned on filling the next cask. Hereupon by further turning the controlling-lever 28 in a direction opposite to that indicated by the arrow the inlet-valve for the hydraulic pressure is entirely closed, and at the same time the outlet-valve is opened. Consequently the fluid under pressure flows away, and the plunger and cask sink under their own weight. In this movement the filling-pipe 8 is removed from the cask, which pipe has displaced as much liquid as the casing of the cock can take up below the plug. Consequently the cask remains quite full notwithstanding the withdrawal of the filling-pipe therefrom.

The pressing in of the bung is effected by placing it by hand into the bung-hole of the cask and sliding the holder or abutment 32 along the U-iron up to a projection 46 beneath the cock, (see Fig. 1, right-hand filling-point,) while the filling-pipe 8 is automatically turned to one side by the holder or abutment or by hand. If now liquid under pressure is allowed to enter the hydraulic cylinder again by opening the inlet-valves, the cask is rapidly raised and the bung forcibly pressed against the presser 33, whereby it is driven in. The elastic packing 34 in this operation prevents damage being done to the cask by reason of imperfect adjustment of the presser 33 and too deep driving in of the bung. After this the cask is again depressed and rolls away in order to make room for a second cask.

As a holder or abutment during pressing in of the bung a tube arranged near the filling hose or pipe can be employed. An example of the latter case will now be described with reference to Figs. 17 to 19. To the cock 4 or even the U-iron 5 there is rotatably connected at 47 a rigid pipe 46 of preferably half-round cross-section, which is provided at its lower end with the above-mentioned presser 33 and also with an elastic washer 34. During the filling of the cask this pipe is turned to one side, (see the dotted position,) while for the pressing in of the bung it is brought into a vertical position, in which, if desired, it partly incloses the filling hose or tube. In this or like forms of construction it is not necessary to turn the filling tube or hose to one side or to remove it.

The supply of empty casks to the apparatus and the removal of the filled casks therefrom is effected in the following manner: The filled and bunged cask during its downward motion deposits itself onto an inclined plane, which can be raised by a pedal or otherwise, and rolls along the same. Simultaneously with this inclined plane a separating part or detent is moved, which normally prevents the rolling along of casks arranged one behind the other on an inclined support, but receives such a position during the lifting of the inclined plane that the casks can roll. If now the inclined plane be depressed again, the foremost cask can roll onto the platen of the lifting apparatus, while the remaining casks are prevented from rolling by the part above mentioned. This arrangement can be constructed in various ways. For example, as shown in Figs. 10 and 11, a bridge which can be raised and lowered is arranged in the cask-support 19, which bridge preferably consists of two connected rails 36, arranged at the sides of the platen 22 and capable of turning about an axis 35. These rails are connected by links 37 and levers 38 to a shaft 39. This shaft can be turned by pressing on a pedal 40 through links 41 and levers 42, and by this means the bridge is turned upward into an inclined position, while it sinks by its own weight to a position just below the level of the cask-support 19. Vertical rectilinearly-guided detent-rods 43 are connected to the pedal-levers 42, which rods engage between the first and second casks when the bridge is depressed. The casks are arranged one behind the other and rest on the inclined support 19, whereby they have the tendency to roll toward the platen 22, which in its lowered position forms the lowermost point of a trough or channel in the cask-support. Concave arms 44 are attached to the rear end of the bridge 36, against which the casks rest when the bridge is raised.

The method of operation of this feeding apparatus is as follows: If during the lowering of the filled cask the bridge is raised by pressing on the pedal 40, the cask deposits itself thereon and begins to roll. During this

time the detent-rods 43 are depressed and permit the casks to roll so far that the foremost cask lies against the curved arms 44 on the bridge. If the bridge is lowered, the detent-rods 43 move upward and pass between the first and second casks. By this means the foremost cask can roll onto the platen 22, while the remaining casks are retained in their position. On subsequent raising of the bridge the casks can roll forward again as the detent-rods 43 are lowered, and so on.

In another form of construction (shown in Figs. 13 to 16) the bridge 36^a is connected by links 48 49 to a frame 50, which is capable of tilting about a shaft 39^a. This frame 50 can be turned by pressing on a pedal 40^a through a lever 41^a, mounted on the shaft 42^a, into the position shown in Fig. 14, whereby the bridge 36^a is simultaneously caused to take up an inclined position. In this position of the tilting frame 50 and of the bridge 36^a the descending full cask can roll away along the inclined bridge 36^a and the next empty cask roll onto the tilting frame 50. On releasing the pedal the parts 36^a 50 return into the positions shown in Fig. 15, in which the fresh cask rolls onto the platen 22 along the inclined plane, which is formed by the tilting frame 50, while the remaining casks are prevented from rolling after by means of the raised left-hand end of the tilting frame 50.

What I claim is—

1. An apparatus for filling casks and like vessels with liquids, characterized by a stationary system of filling-pipes provided with a common shut-off device, in combination with a lifting arrangement for the cask or like vessel, whereby the said cask or like vessel, in order to be filled, is raised up to and pressed tightly against said shut-off device, and also in combination with an abutment against which the filled cask or like vessel is pressed by the said lifting arrangement, for the purpose of pressing in the bung.

2. An apparatus for filling casks and like vessels with liquids, comprising a liquid-reservoir, a filling-pipe in communication at one end with said reservoir below the level of the liquid therein, an air-pipe communicating at one end with the space above the liquid in said reservoir, a cock casing or shell having passages communicating respectively with the other ends of said pipes, a plug to said shell, having passages corresponding to those in said shell and arranged in such a manner that the air-pipe is brought into communication with the interior of the cask or like vessel before the filling-pipe, a gage-glass in said air-pipe above said cock, a branch air-pipe communicating at one end with said air-pipe at a point above said gage-glass and at the other end with a third passage in said cock-casing, and a passage in said plug arranged in such a manner that it connects said third passage with the interior of the cask before and while the main air-pipe is in communication with the interior of the cask.

3. An apparatus for filling casks and like vessels with liquids, comprising a liquid-reservoir, a filling-pipe in communication at one end with said reservoir below the level of the liquid therein, an air-pipe communicating at one end with the space above the liquid in said reservoir, a cock casing or shell having passages communicating respectively with the other ends of said pipes, a plug to said shell, having passages corresponding to those in said shell and arranged in such a manner that the air-pipe is brought into communication with the interior of the cask or like vessel before the filling-pipe, a gage-glass in said air-pipe above said cock, a branch air-pipe communicating at one end with said air-pipe at a point above said gage-glass and at the other end with a third passage in said cock-casing, a passage in said plug arranged in such a manner that it connects said third passage with the interior of the cask before and while the main air-pipe is in communication with the interior of the cask, and a check-valve arranged in said main air-pipe between said gage-glass and the point of connection of said branch air-pipe.

4. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating at one side with the interior of said reservoir, a pendent filling-pipe connected to the other side of said cock, a fluid-pressure cylinder, a plunger in said cylinder, a **V**-shaped platen on said plunger, a series of balls on said platen and means for preventing lateral motion of said balls.

5. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating at one side with the interior of said reservoir, a pendent filling-pipe connected to the other side of said cock, a fluid-pressure cylinder, a plunger in said cylinder, a platen on said plunger, a frame, an abutment on said frame, and a presser on said abutment adapted to engage the bungs of said casks.

6. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating at one side with the interior of said reservoir, a pendent filling-pipe connected to the other side of said cock, a fluid-pressure cylinder, a plunger in said cylinder, means for supporting said cask or like vessel on said plunger, inlet and outlet valves to said cylinder, and means controlled by the motion of said plunger for partially closing said inlet-valve near the end of the upward travel of said plunger, substantially as described.

7. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating at one side with the interior of said reser-

voir, a pendent filling-pipe connected to the other side of said cock, a fluid-pressure cylinder, a plunger in said cylinder, a platen on said plunger, inlet and outlet valves to said cylinder, a lever controlling said inlet and outlet valves, and a spring-pressed pin moved by said plunger and acting on said controlling-lever, substantially as described.

8. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating on one side with the interior of said reservoir, a pendent filling-pipe connected to the other side of said cock, a fluid-pressure cylinder, a plunger in said cylinder, a platen on said plunger, a tilting bridge arranged around said platen, an inclined cask-support in line with said bridge, a detent in combination with said cask-support, and gearing connecting said detent and said bridge in such a manner that, when said bridge is raised, said detent is removed from the path of the casks on said support and vice versa, substantially as described.

9. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating on one side with the interior of said reservoir, a pendent filling-pipe connected to the other side of said cock, a fluid-pressure cylinder, a plunger in said cylinder, a platen on said plunger, a tilting bridge arranged around said platen, an inclined cask-support in line with said bridge, detent-rods extending into the path of the casks on said inclined support, links and levers connecting said detent-rods with said bridge, and a pedal for acting on said levers so as to move said bridge and detent-rods, substantially as described.

10. An apparatus for filling casks or like vessels with liquids, comprising a liquid-reservoir, a filling-pipe in communication at one end with said reservoir below the level of the liquid therein, an air-pipe communicating at one end with the space above the liquid in said reservoir, a cock casing or shell having passages communicating respectively with the other ends of said pipes, a plug to said shell, having passages corresponding to those in said shell and arranged in such a manner that the air-pipe is brought into communication with the interior of the cask or like vessel before the filling-pipe, a filling-pipe depending from said cock, a fluid-pressure cylinder, inlet and outlet valves to said cylinder, a plunger in said cylinder, a V-shaped platen on said plunger, means controlled by the movement of said plunger for actuating said inlet and outlet valves, a tilting bridge arranged around said platen, an inclined cask-support in line with said bridge, a detent controlling the movement of the casks on said support, gearing connecting said detent and said bridge, and a pedal for actuating said gearing, substantially as described.

11. The combination, in an apparatus for filling casks or like vessels with liquids, of a liquid-reservoir, a controlling-cock communicating on one side with the interior of said reservoir, a pendent filling-pipe connected to the other side of said cock, a frame, an abutment movably mounted on said frame, a bung-presser on said abutment, a pad arranged on said abutment, a fluid-pressure cylinder, a plunger in said cylinder, a platen on said plunger, and means for controlling the flow of fluid under pressure to and from said cylinder.

12. An apparatus for filling casks or like vessels with liquids, comprising a liquid-reservoir, a controlling-cock, connecting means between said reservoir and said cock, a filling-tube depending from said cock, a packing-ring around the lower part of said cock, means for forcibly raising said casks or vessels, and a movable abutment with bung-presser, substantially as described.

13. An apparatus for filling casks or like vessels with liquids, comprising a liquid-reservoir, a controlling-cock, connecting means between said reservoir and said cock, a filling-tube depending from said cock, a packing-ring around the lower part of said cock, a passage in the lower part of said cock outside said dependent filling-pipe and inside said packing-ring, means for forcibly raising said casks or vessels, and a movable abutment with a bung-presser, substantially as described.

In testimony whereof I affix hereto my signature in presence of two witnesses.

ADOLF BACHOFEN VON ECHT.

Witnesses:
WENZEL SINKE,
ALVESTO S. HOGUE.