

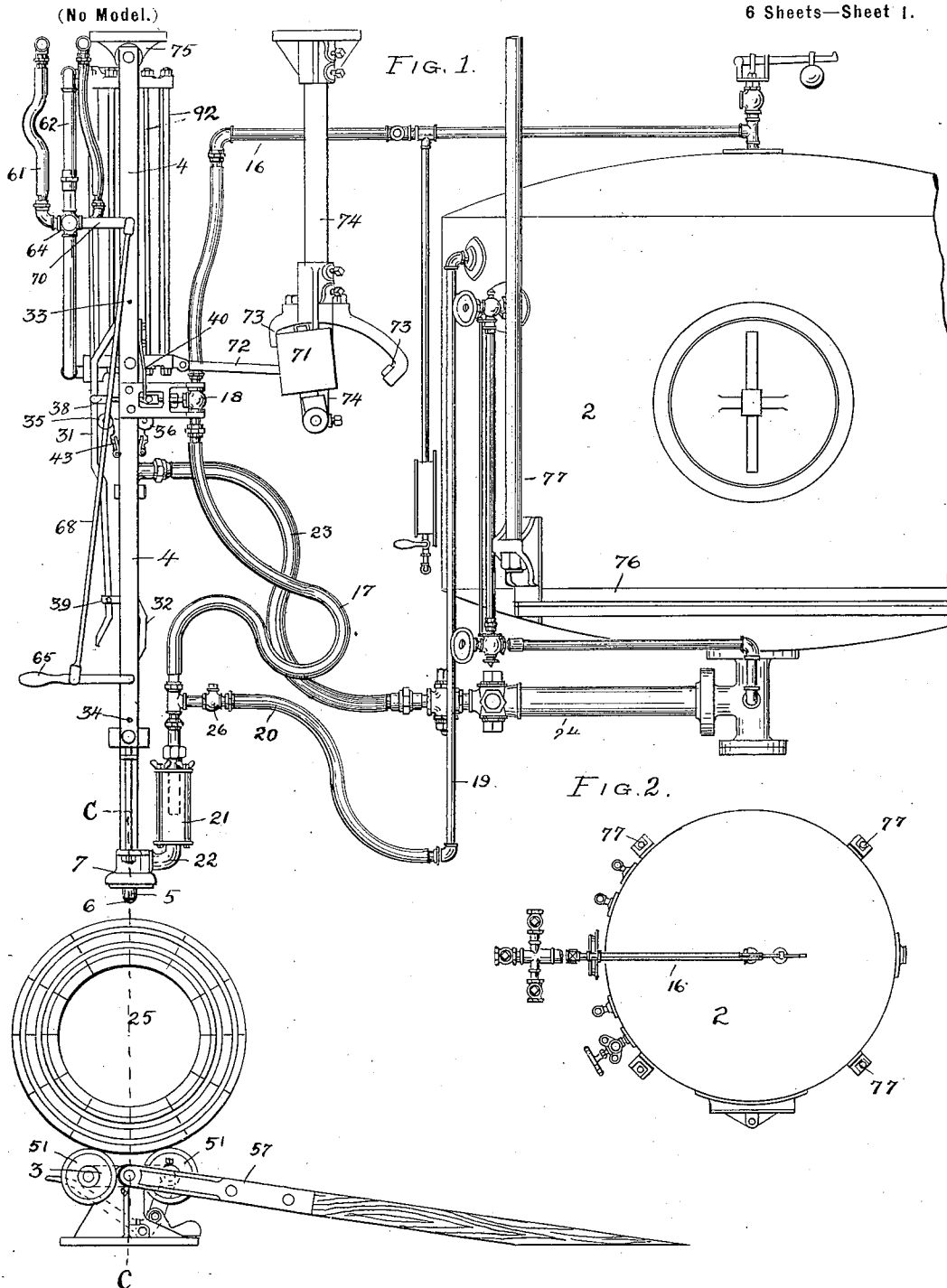
No. 651,651.

Patented June 12, 1900.

H. W. COLBY.
APPARATUS FOR RACKING BEER.

(Application filed Mar. 15, 1899.)

6 Sheets—Sheet 1.



Witnesses,
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6 Sheets—Sheet 2.

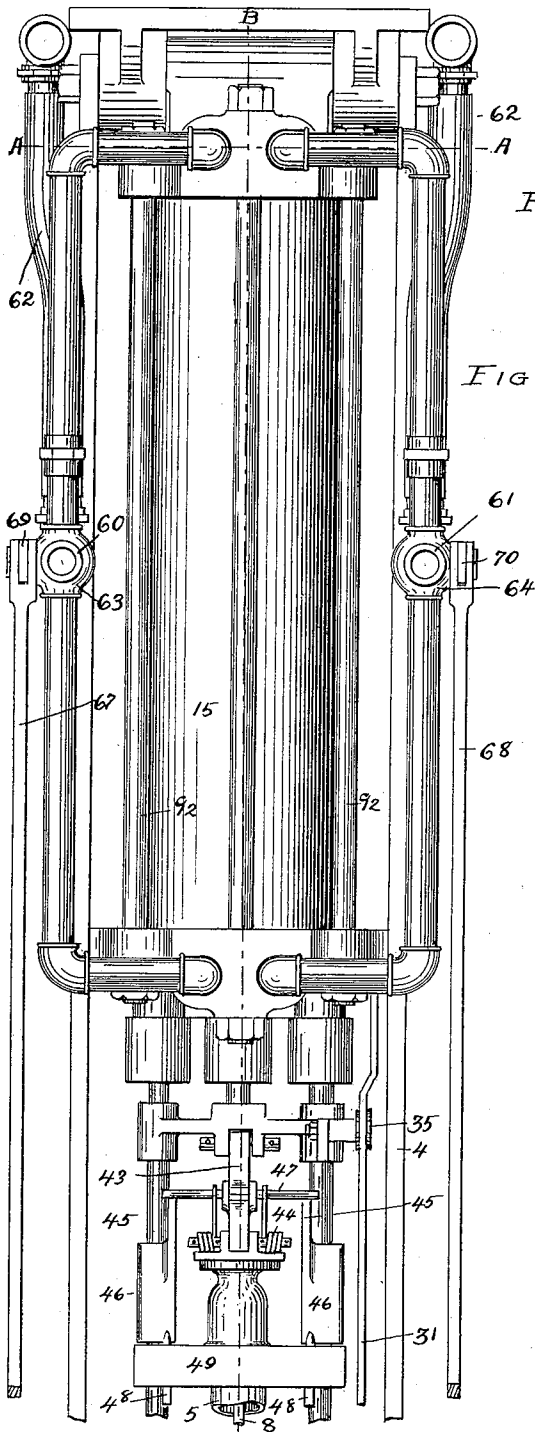


FIG. 4.

FIG. 3.

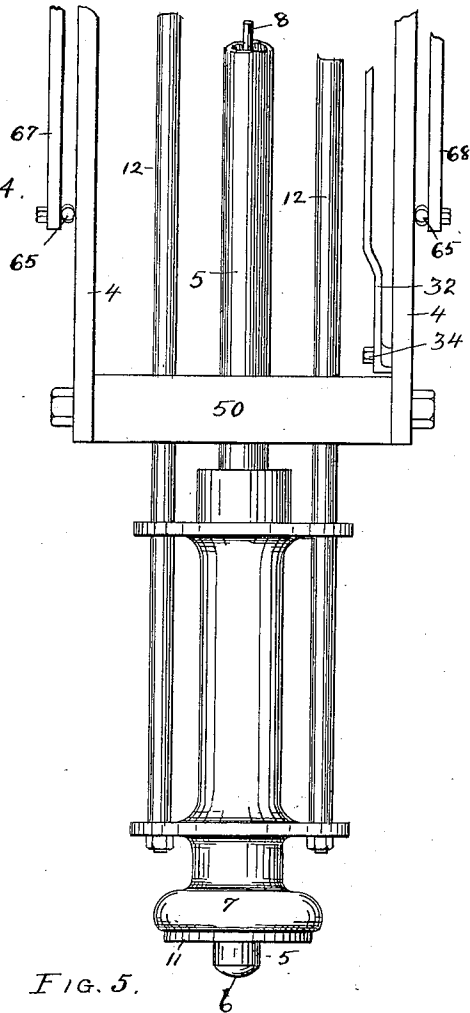
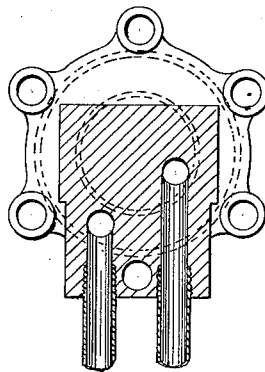


FIG. 5.



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6 Sheets—Sheet 3.

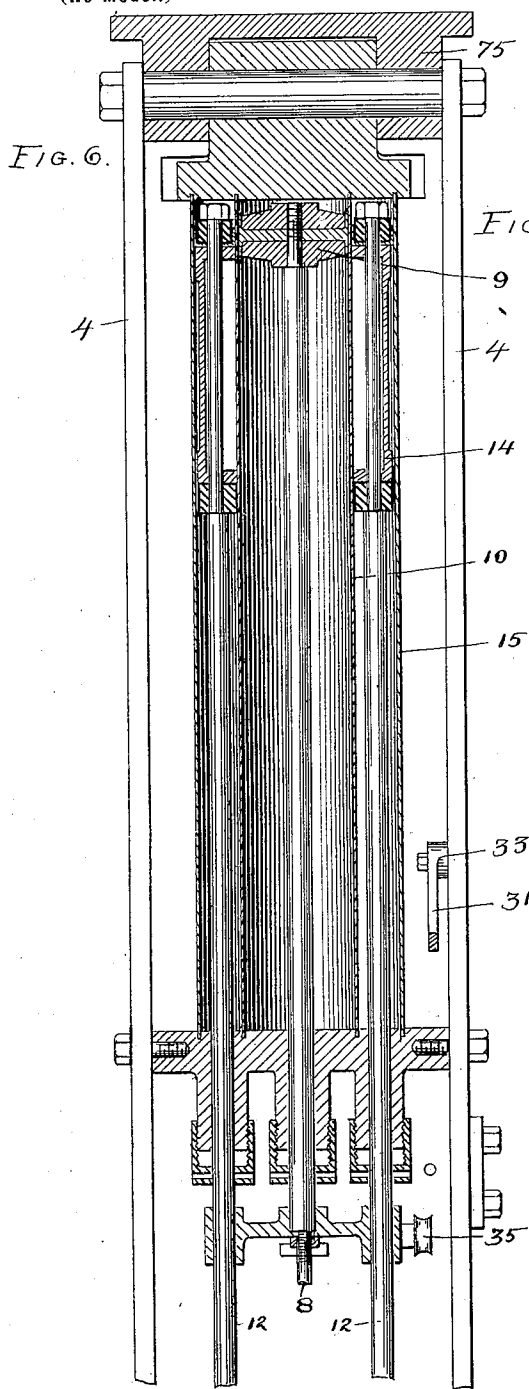
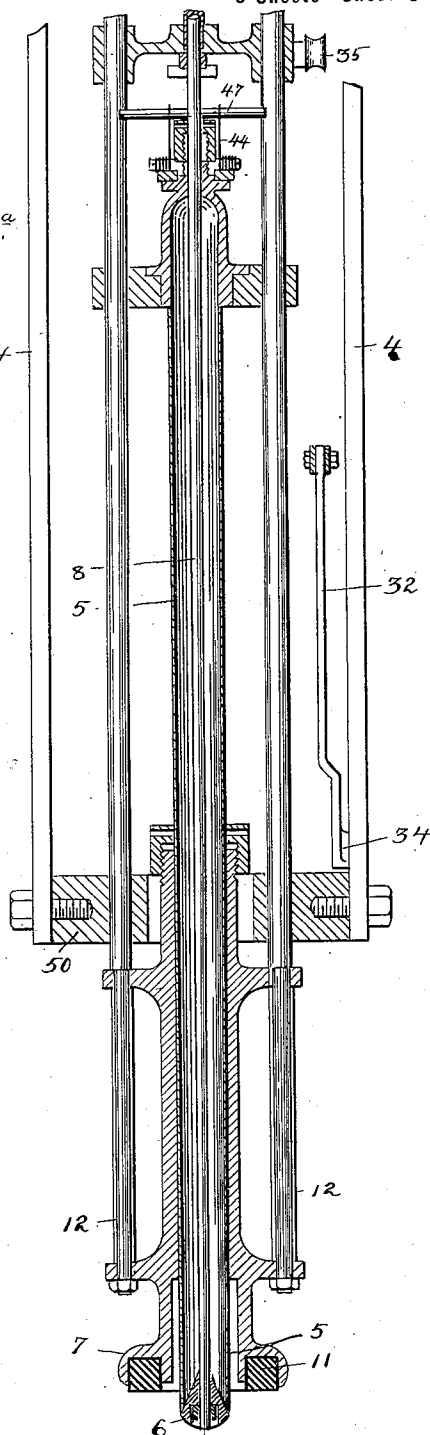


FIG. 6^a.



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No. 651,651.

Patented June 12, 1900.

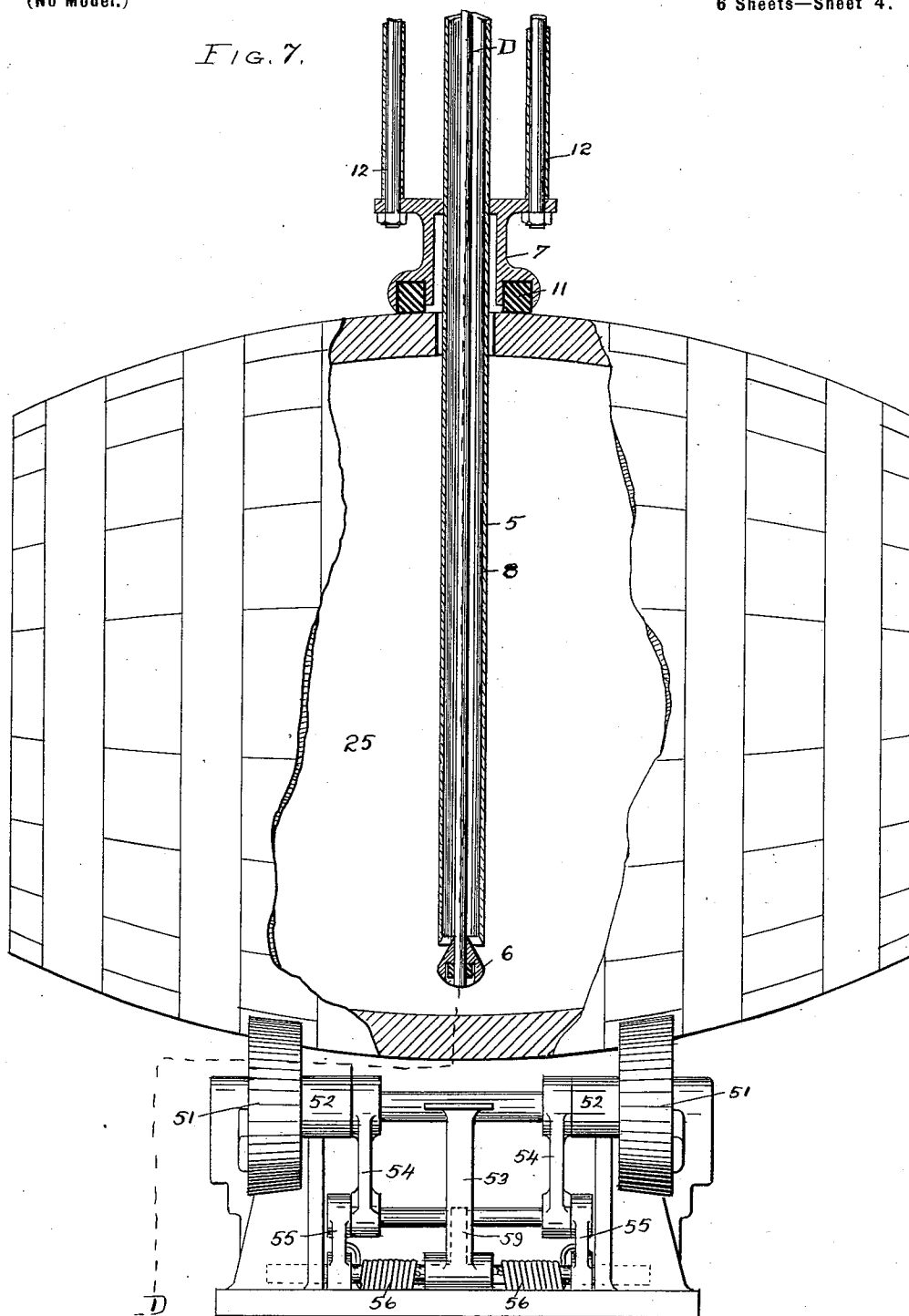
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(No Model.)

6 Sheets—Sheet 4.

FIG. 7.



WITNESSES.

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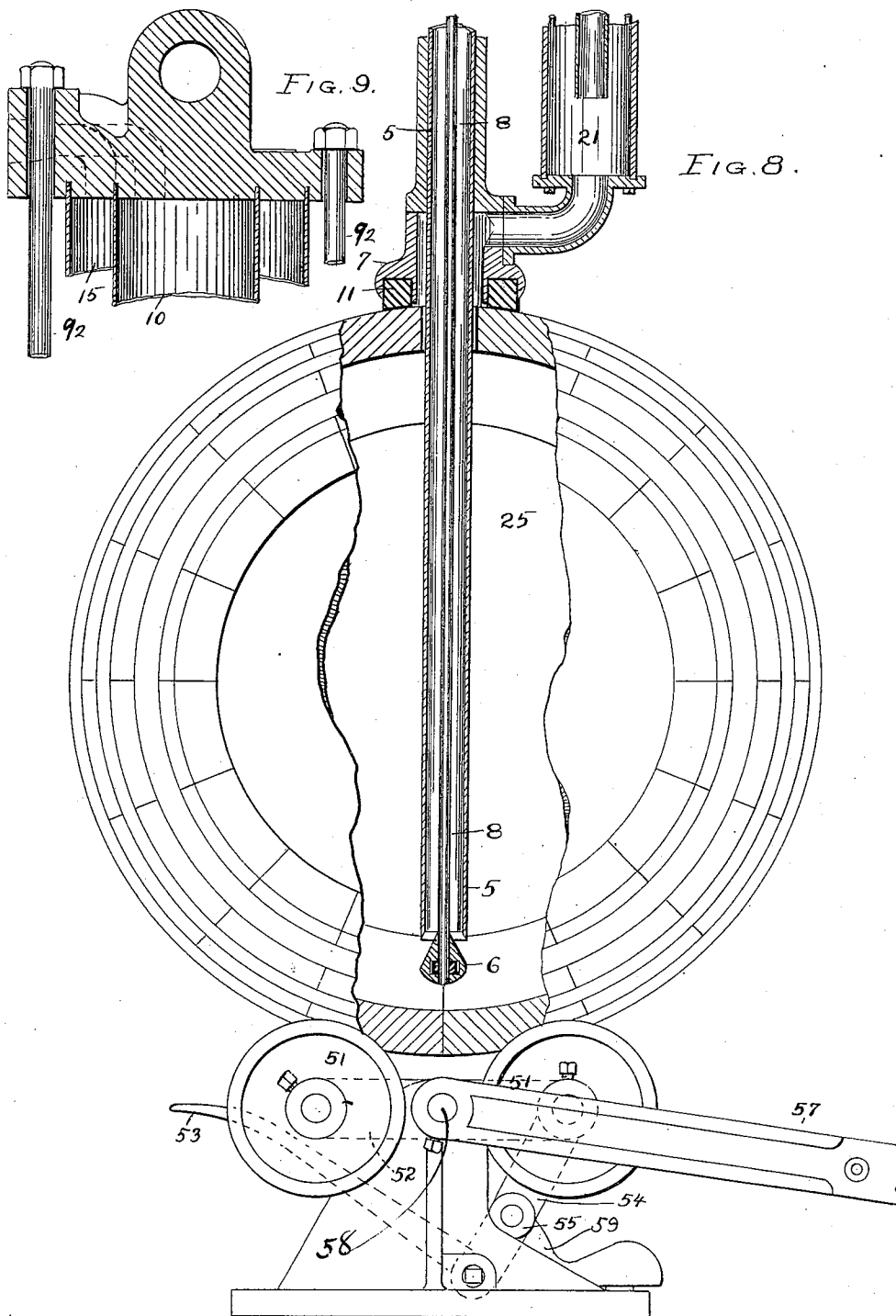
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(Application filed Mar. 15, 1899.)

(No Model.)

6 Sheets—Sheet 5.



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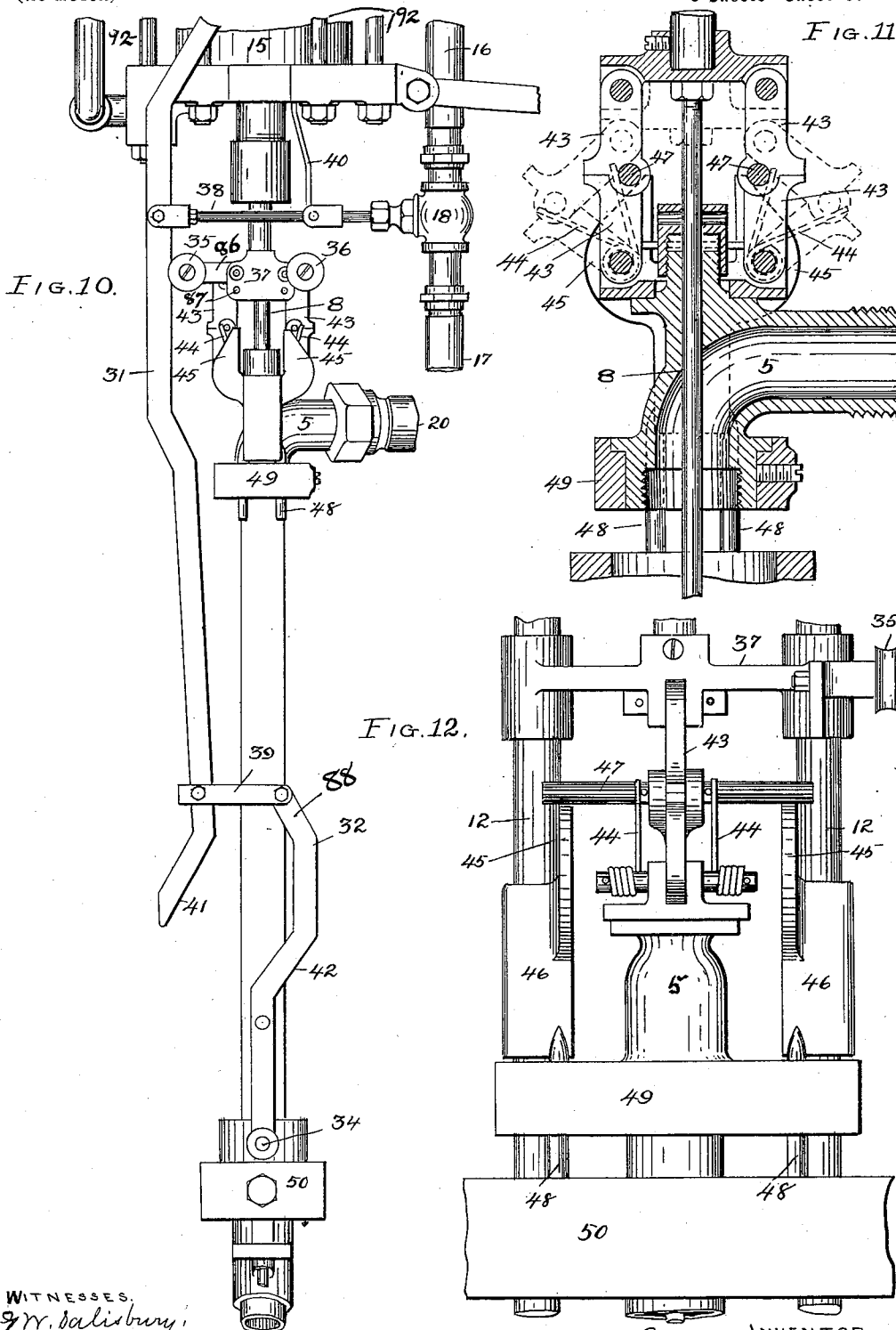
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6 Sheets—Sheet 6.



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APPARATUS FOR RACKING BEER.

SPECIFICATION forming part of Letters Patent No. 651,651, dated June 12, 1900.

Application filed March 15, 1899. Serial No. 709,225. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. COLBY, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Apparatus for Racking Beer, of which the following is a specification.

My invention relates to improvements in apparatus for racking beer, and more particularly to improvements upon the invention or apparatus shown and described in my pending application, Serial No. 616,386, filed December 21, 1896. In the invention and apparatus of my said pending application the beer was forced from the tank into the barrel under pressure, the barrel itself being first filled with air or gas under pressure approximating that of the tank, and the necessary difference of pressure to cause the liquid to flow from the tank into the barrel was maintained by a spring or weight actuated safety-valve controlling the vent through which the air or gas escaped from the barrel into the outer air as the barrel filled with the beer. In the practical use of this apparatus I have found difficulty in keeping the safety-valve or its weight or spring so nicely adjusted as to entirely prevent foaming of the beer, especially as the pressure in the tank itself is liable to variation as the liquid is drawn therefrom.

The object of my present improvement is to obviate or overcome this difficulty and to simplify the construction of my apparatus and perfect its operation.

By my present improvement the pressure in the barrel being filled and that in the tank from which it is filled are maintained at an equilibrium during the entire filling operation by an open connection, pipe, or communication from the upper part of the tank to the upper part of the barrel, and the liquid is caused to flow into the barrel from the tank by gravity, the tank being placed at a higher level than the barrel to secure an operative combination under these conditions of equal pressure in the two. In this way as the barrel is filled the air or gas in the barrel flows back into the tank through the air communication leading from the upper part of the barrel to the upper part of the tank. I thus pre-

vent all danger of causing the beer to foam by reason of its being discharged from one vessel into another under a difference of pressure. To secure the opening and closing of the valve controlling the air communication between the upper part of the tank and the upper part of the barrel in proper order in respect to the sealing of the sealing-sleeve to the barrel and the opening of the beer-valve at the lower end of the filling-pipe, I provide my apparatus with mechanism for automatically performing these functions at the required times.

My invention further consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described, and specified in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of an apparatus embodying my invention, and Fig. 2 is a partial plan view on a smaller scale. Fig. 3 is a front elevation of the upper portion of the apparatus. Fig. 4 is a front elevation of the lower portion thereof; Fig. 5, a horizontal cross-section on line A A of Fig. 3. Figs. 6 and 6^a are central vertical sections at right angles to line B B of Fig. 3. Fig. 7 is a vertical section, partly in elevation, on line C C of Fig. 1. Fig. 8 is a vertical section, partly in elevation, on line D D of Fig. 7. Fig. 9 is an enlarged detail partial section on line B B of Fig. 3. Fig. 10 is an enlarged detail elevation showing the cams or devices for operating the valves. Fig. 11 is an enlarged detail central sectional view showing parts hereinafter to be described, and Fig. 12 is an enlarged detail front elevation of parts hereinafter to be described.

In the drawings, 2 represents the tank or closed vessel from which the beer or other liquid under pressure is to be racked or drawn into the barrel or keg 25 on the barrel-support or cradle 3, which is arranged sufficiently below the level of tank 2 to cause the liquid to readily flow from the tank into the barrel by gravity alone when the pressure in the barrel and tank is uniform or at an equilibrium. 4 is a movable or swinging frame upon which the filling-pipe 5, its valve 6 at the lower end thereof, the sealing sleeve or head 7,

and the mechanism for operating the same are all mounted to reciprocate as required to seal or close the sealing-sleeve to the barrel around the bung thereof and to insert the filled tube into the barrel and withdraw it therefrom and to open and close the valve at the lower end of said filled tube.

8 is the valve-stem by which the valve 6 is connected to the piston 9 of the hydraulic cylinder 10, by which the valve and valve-stem and filling-tube 5 are inserted into the barrel.

The sealing-sleeve 7, which is provided with a rubber or elastic packing-ring 11, is attached by connecting-rods 12 with the piston 14 of a hydraulic cylinder 15, by which said sealing-sleeve is reciprocated to bring it into contact with the barrel and hold or seal it thereto. The hydraulic cylinder 15 is annular in cross-section and surrounds the cylinder 10, thus making a much simpler and more compact construction than where the two cylinders are arranged tandem or one above another.

16 is an air-inlet pipe leading from the top or upper part of the tank 2 and communicating with the upper portion of the barrel through the sealing-sleeve 7, said air-inlet pipe having a hose or flexible section 17 to permit the necessary up-and-down and lateral or swinging movements of the sealing-sleeve. The air-inlet pipe is provided with a valve 18, by which it may be opened and closed at intervals, as required.

19 is an air-outlet pipe leading from the lower portion of the air-inlet pipe to the upper portion of the tank 2, and through which the air escapes from the barrel into the tank as the barrel fills with liquid from the tank. The air-outlet pipe 19 is likewise provided with a hose or flexible section 20 for the same purpose, as before described.

21 is a glass gage or vessel inserted between the lower end of the air-inlet pipe and the branch 22 of the sealing-sleeve 7. The glass gage or vessel 21 is intended to hold sufficient liquid to compensate for the space occupied by the filling-tube, so that when the filling-tube is withdrawn the liquid flowing back into the barrel from this gage or vessel 21 will leave the barrel completely full of liquid. The lower end or portion 26 of the air-inlet pipe 16 slides up and down adjustably in the head or top of the gage 21 and may be made to project a greater or less distance down into the gage or vessel 21, according to the size or diameter of the barrel or package being filled and the consequent length of the filling-tube required to reach to its bottom or lower portion. The filling-tube 5 communicates with the tank 2 through a flexible pipe 23, united to the filling-tube near its upper end and to the pipe 24, communicating with the lower portion of the tank 2.

The air-outlet pipe 19 is provided with a check-valve 25, which permits the air or liquid to flow back from the barrel into the tank, but not in the opposite direction. The air-

inlet valve 18 is automatically opened and closed as the piston-rod or valve-stem 8 is reciprocated by means of movable cam-levers 31 32, pivoted at 33 34, respectively, to the frame 4, which are engaged by rollers or trolleys 35 36 on the cross bar or head 37, attached to the piston-stem 8, and which cam levers or tracks are connected to the valve by a connecting-rod 38, the two cam-levers being connected together by a pivoted link 39, as will be readily understood from Figs. 1 and 10 of the drawings.

When the roller 35 strikes the incline of the cam-lever 31, the air-inlet valve is opened and it remains open while the trolley is traveling over the straight portion of the cam levers or tracks 31 32, this interval giving sufficient time for the barrel or package 25 to become filled with air under pressure from the tank 2 through the air-inlet pipe 16. The spring 40 then closes the air-inlet pipe when the rollers or trolleys 35 36 reach the inclines 41 42 of the cam levers or tracks 31 32. On the upward or backward movement of the valve-stem and filling-tube the incline 41 on the cam track or lever 32 again immediately opens the air-inlet valve, thus forcing the liquid in the glass gage or vessel 21 back into the barrel to fill the space left by the withdrawal of the filling-tube.

The valve-stem 8 is adapted to reciprocate slightly in respect to the filling-tube 5, or sufficient to permit the proper opening of the valve, and it is connected to said valve-stem by a pair of toggle links or arms 43 43, the same being held normally closed by springs 44 44. These toggle-links 43 43 are bent or opened, as shown by the dotted lines in Fig. 11, to permit the downward movement of the valve 6 and valve-stem 8 to further continue after the downward movement of the filling-tube 20 has been stopped, and thus open the valve by means of cams 45 45 on the head 46, which engages the pivot 47 of the toggle-arms. The sliding head 46 is thus reciprocated to cause the cams to operate the toggles by the pins 48, attached to said cam-slide 46 in the head 49, striking against the head or stop 50 on the frame 4.

The support 3, on which the barrel or package 25 rests while being filled, preferably comprises two pairs of rollers 51 51, journaled on the opposite ends of a pivoted cradle or lever 52, which is adapted to be tilted up at one end and down at the other to receive and discharge the barrel by means of a bent foot-lever 53 and connecting toggle-links 54 55, the connecting-pivot of which toggles are engaged by the arm 59 of the bent foot-lever. A spring 56 holds the two arms of the toggle in position. By pressing down on the foot-lever the roller, cradle, or barrel-support is tilted to discharge the barrel down the track or runway 57, the upper end of which is supported on the pivot 58 of the barrel-support or cradle.

60 and 61 are the water or other fluid sup-

ply pipes leading to the hydraulic cylinders 10 15, and 62 62 are the exhaust or discharge pipes.

63 64 are the four-way valves for controlling the admission and discharge of the water under pressure to the hydraulic cylinders. These valves are operated by hand-levers 65 66, connected by rods 67 68 with the valve-operating arms 69 70.

71 is a pivoted counterpoise or weight connected by a link 72 with the swinging frame 4 for the purpose of holding said frame to one side while the bung is being driven in the filled barrel.

73 73 designate a yoke or stop-arm for limiting the movements of the weight or counterpoise. The counterpoise is pivoted to a bracket or standard 74, attached to the ceiling. The swinging frame 4 is pivoted to a bracket 75, attached to the ceiling. The tank 2 is preferably suspended or supported at suitable height above the barrel-support or cradle 3 by means of a frame 76, upon which it rests and which is suspended by rods 77 from the ceiling or beams overhead the apparatus.

The trolley-wheel or roller 35 is mounted on a hinged arm 86, which may be made rigid to its carrying-head 37 by a removable pin 87 or left flexible or inactive on the downward movement of the head 37 by the removal of said pin.

The opposite heads or ends of the hydraulic cylinders 10 15 are secured together by connecting-rods 92 92.

In operation a barrel is first placed in position on the cradle or support 3 with its opening or bung uppermost. A downward movement of the hydraulic-cylinder-operating lever 65 starts the filling-tube, valve, and valve-stem operated thereby downward and causes the same to enter the package. A downward movement of the other or left-hand lever 66 starts the sealing head or sleeve downward and seals the same against the package or barrel. After the package is thus sealed another downward movement of the right-hand lever 65 starts the filling-tube again and causes the same to enter the barrel or package until its lower end almost reaches the bottom of the barrel or package, as illustrated in Fig. 7. At the beginning of this downward movement of the filling-tube the roller or trolley 35 engages the cam lever or track 31, and thus opens the air-inlet valve and holds it open until the barrel or package is filled with air under the same pressure as that in the tank 2, thus establishing an equilibrium. As the filling-tube, valve, and valve-stem approach the downward limit of their movement the air-valve is closed by its operating-spring, the rollers or trolleys having at this time reached the lower inclines of the cam levers or tracks 31 32. After equilibrium of pressure has thus been established in the barrel and tank and the air-valve closed the pins 48, carried on the cam-slide 46, engage the stop-head 50 on the frame 4 and op-

erate the cam-slide, by which the toggles 43 43 are bent or turned to permit the further downward movement of the valve and valve-stem after the downward movement of the filling-tube is arrested, thus opening the valve and permitting the beer to flow from the tank into the barrel or package by its own gravity, owing to the elevation of the tank 2 above the barrel. As the beer flows into the barrel from the tank the air displaced by the liquid flows back from the barrel to the tank through the air-outlet pipe 19 until the package is full, the beer or liquid continuing to flow until it rises in the air-outlet pipe to the same level as the beer in the tank. The beer or liquid, however, does not enter the air-inlet pipe 16, because at this time the air-valve 18 is closed, and the air in the air-inlet pipe thus prevents liquid from entering it. An upward movement of the right-hand lever 35 causes the valve 6 and valve-stem to move upward and close said valve against the lower end of the filling-tube and causes the hydraulic cylinder and piston 10 9 to withdraw the filling-tube out of the barrel. At the early part of this upward movement of the filling-tube the roller or trolley 36 engages the lower incline on the cam lever or track 32, thus again opening the valve 18 and forcing the beer from the glass gage or vessel 21 back into the barrel to compensate for the displacement of the filling-tube. When the filling-tube is withdrawn or substantially withdrawn from the barrel, the air-valve 18 is again closed by its spring 40, the rollers or trolleys 35 36 having at this time reached the upper inclines of the cam levers or tracks 31 32. An upward movement of the left-hand lever 36 then causes the hydraulic cylinder and piston 15 14 to lift the sealing-head from the barrel. The operator then quickly pushes the swinging frame 4 to one side to permit the bung to be driven into the barrel, which is quickly done. As the pressure in the barrel and tank is maintained equal until the filling-tube is withdrawn and until the instant of lifting the sealing sleeve or head from the barrel, a moment of time is allowed for swinging the frame 4 out of position and bunting the barrel before the beer will expand and overflow from the package, as it will not thus expand and begin to overflow instantly. If, however, an interval of three or four seconds is allowed to elapse after the sealing-head is lifted before the barrel is bunged, it will begin to overflow, and in a very few seconds it would begin to spurt out to a considerable height. After the filled barrel has been bunged the cradle or support 3 is tilted by the foot-lever and the barrel discharged down the runway. Another barrel being placed upon the support 3, the operation is repeated. When the filling-tube is inserted in the barrel and its valve 6 opened, the liquid begins to flow from the tank into the barrel and to drive the air out through the filling-sleeve, branch 22, gage or vessel 21, and through the pipe 16 20 19 back into

the upper portion of the tank. Whatever liquid may have collected in the air-outlet pipes 20 19 will be driven out of said pipes into the tank by the descent of the liquid flowing into the barrel from the tank through the filling-tube, owing to the elevation of the tank 2 above the barrel or vessel 25, and I find that in actual practice this operation will take place although the upper end of the pipe 19 may be three or four feet or more above the level of the liquid in the tank 2. In order for the air which is forced out of the sealed barrel to practically force back the liquid that may be collected in the pipes 20 19 and carry or force such liquid back into the tank 2 at a greater height than the level of the liquid therein and at the same time cause the gage or vessel 21 to contain the proper amount of liquid to fill the space left by the withdrawal of the filling-tube, I have found by my experiments that it is necessary that the pipes 20 19 should preferably be three-fourths of an inch or more in diameter. It is this particular action or operation of the descending liquid through the filling-pipe forcing the liquid out of the air-outlet pipe into the tank above the level of the liquid therein which enables me to practically secure the great advantage of having an open communication between the barrel and tank during the whole operation of filling the barrel, and it is upon my discovery of this operation in actual practice that the great practical success and efficiency of my apparatus depends.

In filling barrels or large packages a considerable interval of time is required for the valve 18 to be opened in order for the air-pressure in the tank 2 and in the barrel to become equalized, and with large packages, therefore, the travel of the trolley-wheels or rollers upon the straight parallel portion of the cam levers or tracks 31 32 is necessarily of considerable extent, as illustrated in the drawings. It will of course, however, not do to open the air-inlet valve 18 until the sealing head or sleeve 7 is sealed to the barrel or package, and to adapt my apparatus for filling very small packages, therefore, I mount the trolley-wheel or roller 35 upon a pivoted arm 86, which may be fixed rigidly to its carrying-head by a removable pin 87. In operating upon large barrels the arm 86 is fixed rigid by the insertion of the pin 87; but in operating upon very small packages the pin 87 is removed, so that the arm 86 may turn on its pivot when the roller 35 strikes the incline on the cam lever or track 31, and thus not be operated by said incline to move said cam-lever 31 and the valve 18, connected thereto. In this case the valve 18 is opened by the incline 88 on the cam-lever 32, which is engaged by the trolley-wheel or roller 36, the straight or parallel portion of the cam lever or track 32 being long enough to give a sufficient interval for the air to fill a small package. On the return movement in this case the air-valve 18 is first opened by

the lower incline of the cam-lever 32, as before described, and the valve held open by the straight portions of the cam-levers 31 32, the same as in the case before described, where a large barrel is being filled.

80 is a glass gage communicating with the tank 2 to show the level of the liquid therein.

81 is a safety-valve to permit the escape of air or gas from the tank 2 when the pressure therein rises above the required degree.

As the barrels are filled the air, carbonic-acid gas, or other gas therein is forced back into the tank 26, replacing the space occupied by the liquid withdrawn therefrom.

I claim—

1. In a beer-racking apparatus, the combination with a closed tank for containing the beer or other liquid under pressure, of a barrel-support below the tank to enable the beer or liquid under pressure to flow by its own gravity from the tank into the barrel, a filling-tube having a valve at its lower end, a sealing sleeve or head surrounding the filling-tube, an air-inlet pipe or communication from the upper portion of the tank to the sealing sleeve or head, an air-outlet pipe or communication from the sealing head or sleeve to the upper portion of the tank, and a pipe or communication connecting the filling-tube to the lower portion of the tank; whereby the air-pressure in the sealed tank and barrel may be equalized before the filling operation begins and maintained equal during the entire filling operation by the open air-outlet communication between the barrel and the tank through which the air in the barrel is forced back into the tank as the barrel fills with liquid, substantially as specified.

2. In a beer-racking apparatus, the combination with a closed tank for containing the beer or other liquid under pressure, of a barrel-support below the tank to enable the beer or liquid under pressure to flow by its own gravity from the tank into the barrel, a filling-tube having a valve at its lower end, a sealing sleeve or head surrounding the filling-tube, an air-inlet pipe or communication from the upper portion of the tank to the sealing sleeve or head, an air-outlet pipe or communication from the sealing head or sleeve to the upper portion of the tank, and a pipe or communication connecting the filling-tube to the lower portion of the tank; whereby the air-pressure in the sealed tank and barrel may be equalized before the filling operation begins and maintained equal during the entire filling operation by the open air-outlet communication between the barrel and the tank through which the air in the barrel is forced back into the tank as the barrel fills with liquid, a valve in said air-inlet pipe, and mechanism for automatically opening and closing said valve at intervals as required, substantially as specified.

3. In a beer-racking apparatus, the combination with a closed tank for containing the beer or other liquid under pressure, of a bar-

rel-support below the tank to enable the beer or liquid under pressure to flow by its own gravity from the tank into the barrel, a filling-tube having a valve at its lower end, a sealing sleeve or head surrounding the filling-tube, an air-inlet pipe or communication from the upper portion of the tank to the sealing sleeve or head, an air-outlet pipe or communication from the sealing head or sleeve to the upper portion of the tank, and a pipe or communication connecting the filling-tube to the lower portion of the tank, whereby the air-pressure in the sealed tank and barrel may be equalized before the filling operation begins and maintained equal during the entire filling operation by the open air-outlet communication between the barrel and the tank through which the air in the barrel is forced back into the tank as the barrel fills with liquid, a valve in said air-inlet pipe, mechanism for automatically opening and closing said valve at intervals as required, and a check-valve in the air-outlet pipe, substantially as specified.

4. In a beer-racking apparatus, the combination with a closed tank for containing the beer or other liquid under pressure, of a barrel-support below the tank to enable the beer or liquid under pressure to flow by its own gravity from the tank into the barrel, a filling-tube having a valve at its lower end, a sealing sleeve or head surrounding the filling-tube, an air-inlet pipe or communication from the upper portion of the tank to the sealing sleeve or head, an air-outlet pipe or communication from the sealing head or sleeve to the upper portion of the tank, and a pipe or communication connecting the filling-tube to the lower portion of the tank, whereby the air-pressure in the sealed tank and barrel may be equalized before the filling operation begins and maintained equal during the entire filling operation by the open air-outlet communication between the barrel and the tank through which the air in the barrel is forced back into the tank as the barrel fills with liquid, a valve in said air-inlet pipe, mechanism for automatically opening and closing said valve at intervals as required, power-operated mechanism for reciprocating the filling-tube and valve to insert the same into the barrel or package and to open said valve, power-operating mechanism for reciprocating the sealing sleeve or head and seal it to the barrel or package, substantially as specified.

5. In a beer-racking apparatus, the combination with a movable filling-tube connected with the tank and adapted to be inserted into the barrel or package, of a valve at the lower end of said tube, an independently-movable sealing sleeve or head surrounding said filling-tube, an air-inlet pipe leading from the upper portion of the closed tank and communicating with said sealing sleeve or head through which air or gas may be admitted to the sealed barrel or package to establish an

equilibrium of pressure between the two, a valve for closing said air-inlet pipe when such equilibrium of pressure is established and an air pipe or communication between said sealing sleeve or head and the upper portion of the tank through which the air in the barrel is forced back into the tank as the barrel is filled, substantially as specified.

6. In a beer-racking apparatus, the combination with a movable filling-tube connected with the tank and adapted to be inserted into the barrel or package, of a valve at the lower end of said tube, an independently-movable sealing sleeve or head surrounding said filling-tube, an air-inlet pipe leading from the upper portion of the closed tank and communicating with said sealing sleeve or head through which air or gas may be admitted to the sealed barrel or package to establish an equilibrium of pressure between the two, a valve for closing said air-inlet pipe when such equilibrium of pressure is established and an air pipe or communication between said sealing sleeve or head and the upper portion of the tank through which the air in the barrel is forced back into the tank as the barrel is filled, the tank being above the barrel to cause the liquid to flow by gravity from the barrel into the tank, substantially as specified.

7. In a beer-racking apparatus, the combination with a movable filling-tube connected with the tank and adapted to be inserted into the barrel or package, of a valve at the lower end of said tube, an independently-movable sealing sleeve or head surrounding said filling-tube and an air pipe or communication between said sealing sleeve or head and the upper portion of the tank through which the air in the barrel is forced back into the tank as the barrel is filled, and an air-inlet pipe leading from the tank to the sealing-sleeve and provided with a valve and mechanism for automatically opening and closing the same, substantially as specified.

8. The combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a reciprocating valve at its lower end, power-operated mechanism for reciprocating the sealing-sleeve, power-operated mechanism for reciprocating the filling-tube and valve-stem, and a toggle connection between the valve-stem and filling-tube to permit the valve-stem to move in respect to the filling-tube to open the valve, substantially as specified.

9. The combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a reciprocating valve at its lower end, power-operated mechanism for reciprocating the sealing-sleeve, power-operated mechanism for reciprocating the filling-tube and valve-stem, a toggle connection between the valve-stem and filling-tube to permit the valve-stem to move in respect to the filling-tube to open the valve, and devices for automatically operating said toggle connection, substantially as specified.

10. In a beer-racking apparatus, the combination with a swinging frame, of a sealing-sleeve reciprocating thereon, a filling-tube reciprocating on said frame and having a valve at its lower end, a valve-stem for operating said valve, a toggle connection between the valve-stem and filling-tube, and movable cams for operating said toggle connection, substantially as specified.
11. In a beer-racking apparatus, the combination with a swinging frame, of a sealing-sleeve reciprocating thereon, a filling-tube reciprocating on said frame and having a valve at its lower end, a valve-stem for operating said valve, a toggle connection between the valve-stem and filling-tube, movable cams for operating said toggle connection, and a stop on said frame to move said cams, substantially as specified.
12. In a beer-racking apparatus, the combination with a closed tank, of a reciprocating sealing-sleeve, a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem connected to said valve, an air communication between said sealing-sleeve and tank provided with a valve, a cam lever or track for operating said valve, and a movable roller or trolley engaging said cam lever or track to operate the valve as the filling-tube and valve-stem are reciprocated, substantially as specified.
13. In a beer-racking apparatus, the combination with a closed tank, of a reciprocating sealing-sleeve, a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem connected to said valve, an air communication between said sealing-sleeve and tank provided with a valve, a cam lever or track for operating said valve, a movable roller or trolley engaging said cam lever or track to operate the valve as the filling-tube and valve-stem are reciprocated, and a secondary cam-lever connected to the first-mentioned cam-lever, substantially as specified.
14. In a beer-racking apparatus, the combination with a closed tank, of a reciprocating sealing-sleeve, a reciprocating filling-tube, an air-inlet pipe leading from the upper portion of said closed tank and communicating with said sealing-sleeve through which air or gas may be admitted to the sealed barrel or package to establish an equilibrium of pressure between the sealed barrel or package and the closed tank, a valve for closing said air-inlet pipe when such equilibrium of pressure is established, and an air-outlet pipe or communication between said sealing-sleeve and the upper portion of the tank provided with a gage or vessel to contain a sufficient amount of liquid to compensate for the space occupied by the filling-tube, substantially as specified.
15. In a beer-racking apparatus, the combination with a closed tank, of a reciprocating sealing-sleeve, a reciprocating filling-tube, an air-inlet pipe leading from the upper portion of said closed tank and communicating with said sealing-sleeve through which air or gas may be admitted to the sealed barrel or package to establish an equilibrium of pressure between the sealed barrel or package and the closed tank, a valve for closing said air-inlet pipe when such equilibrium of pressure is established, and an air-outlet pipe or communication between said sealing-sleeve and the upper portion of the tank provided with a gage or vessel to contain a sufficient amount of liquid to compensate for the space occupied by the filling-tube, said air pipe or vessel projecting into said gage or vessel to regulate the amount of liquid said gage or vessel may contain to correspond to the displacement of the liquid in the barrel or package, substantially as specified.
16. In a beer-racking apparatus, the combination with the tank and sealing-sleeve of an air pipe or communication between the sealing-sleeve and the upper portion of the tank, provided with a valve and a movable cam lever or track connected with the valve and a reciprocating device engaging said cam lever or track to automatically operate the valve at intervals, substantially as specified.
17. In a beer-racking apparatus, the combination with the tank and sealing-sleeve of an air pipe or communication between the sealing-sleeve and the upper portion of the tank, provided with a valve and a movable cam lever or track connected with the valve and a reciprocating device engaging said cam lever or track to automatically operate the valve at intervals, and a spring for closing the valve, substantially as specified.
18. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, and an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, substantially as specified.
19. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, and a swinging frame upon which said parts are mounted, substantially as specified.
20. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, a swinging

frame upon which said parts are mounted, a closed tank, an air pipe or communication between said closed tank and sealing-sleeve, a valve for opening and closing said pipe, and a cam lever or track for operating said valve, substantially as specified.

21. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, a swinging frame upon which said parts are mounted, a closed tank, an air pipe or communication between said closed tank and sealing-sleeve, a valve for opening and closing said pipe, a cam lever or track for operating said valve, and a reciprocating roller or device engaging said cam lever or track, substantially as specified.

22. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, a swinging frame upon which said parts are mounted, a closed tank, an air pipe or communication between said closed tank and sealing-sleeve, a valve for opening and closing said pipe, a cam lever or track for operating said valve, a reciprocating roller or device engaging said cam lever or track, and an air-outlet pipe forming a communication between said sealing-sleeve and the upper portion of the tank when said valve is closed, substantially as specified.

23. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, a swinging frame upon which said parts are mounted, a closed tank, an air pipe or communication between said closed tank and sealing-sleeve, a valve for opening and closing said pipe, a

cam lever or track for operating said valve, a reciprocating roller or device engaging said cam lever or track, an air-outlet pipe forming a communication between said sealing-sleeve and the upper portion of the tank when said valve is closed, and a check-valve in said air-outlet pipe, substantially as specified.

24. In a beer-racking apparatus, the combination with a reciprocating sealing-sleeve, of a reciprocating filling-tube having a valve at its lower end, a reciprocating valve-stem, a hydraulic cylinder and piston for operating the valve and filling-tube, an annular hydraulic cylinder and piston surrounding said first-mentioned cylinder and piston for operating the sealing sleeve or head, a swinging frame upon which said parts are mounted, a closed tank, an air pipe or communication between said closed tank and sealing-sleeve, a valve for opening and closing said pipe, a cam lever or track for operating said valve, a reciprocating roller or device engaging said cam lever or track, and an air-outlet pipe forming a communication between said sealing-sleeve and the upper portion of the tank when said valve is closed, a weight or counterpoise for said swinging frame, and stops for limiting the movement of said weight, substantially as specified.

25. In a beer-racking apparatus, the combination with a closed filling-tank, of a reciprocating sealing-sleeve, a reciprocating filling-tube, an air-inlet pipe leading from the upper portion of said closed tank and communicating with said sealing-sleeve through which air or gas may be admitted to the sealed barrel or package to establish an equilibrium of pressure between the sealed barrel or package and the closed tank, a valve for closing said air-inlet pipe when such equilibrium of pressure is established, and an air-outlet pipe or communication between said sealing-sleeve and the upper portion of the tank provided with a gage or vessel to contain a sufficient amount of liquid to compensate for the space occupied by the filling-tube, said air pipe or communication having an adjustable section reciprocating through the top or head of said gage or vessel to adjust the amount of liquid therein to the space left by the withdrawal of the filling-tube according to the size of the barrel or package, substantially as specified.

HARRY W. COLBY.

Witnesses:

EDMUND ADCOCK,
H. M. MUNDAY.