No. 736,152. PATENTED AUG. 11, 1903.

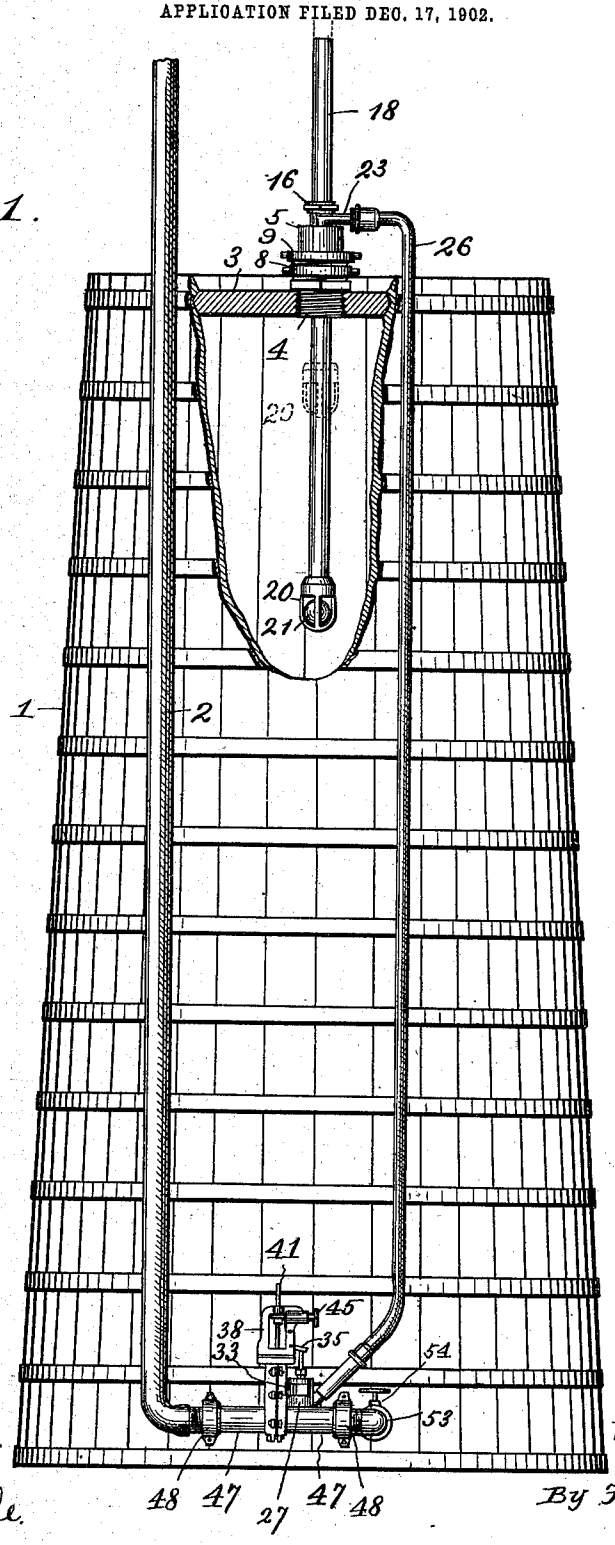
W. RENNER.

COMBINED AUTOMATIC SIGNAL AND CUT-OFF FOR TANK FILLING APPARATUS.

APPLICATION FILED DEC. 17, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.




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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.

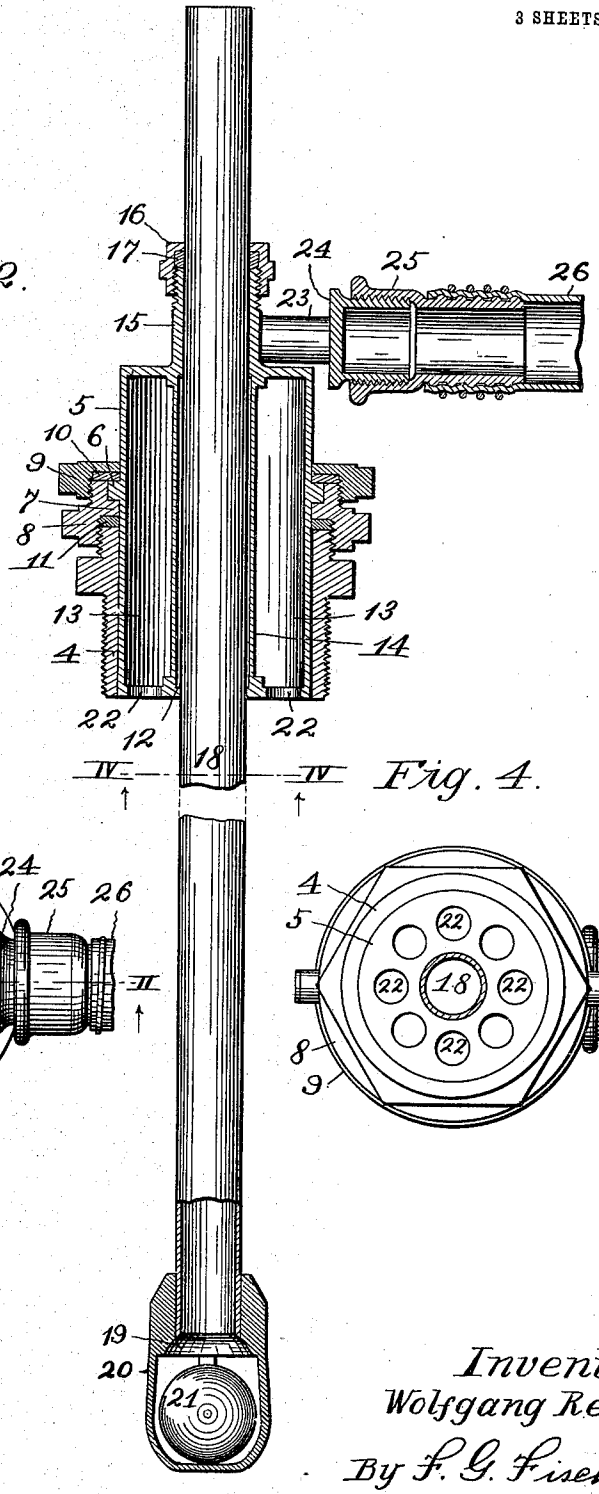



Fig. 3.

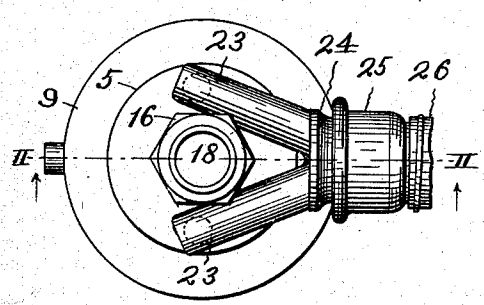



Fig. 4.




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NO MODEL. 3 SHEETS—SHEET 3

Fig. 6.

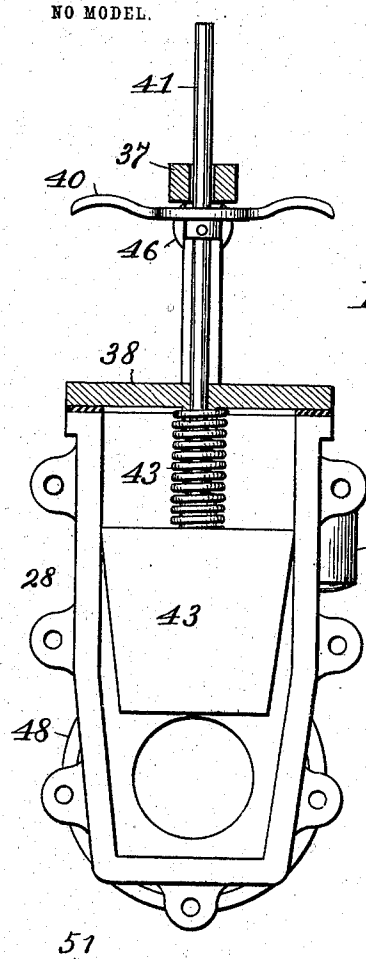



Fig. 7.

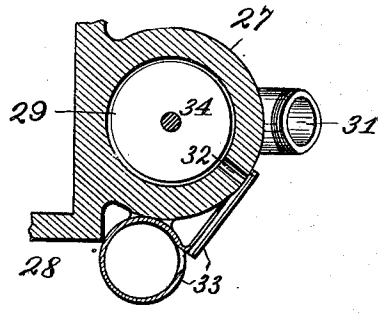



Fig. 5.




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No. 736,152. Patented August 11, 1903.

# UNITED STATES PATENT OFFICE.

WOLFGANG RENNER, OF KANSAS CITY, MISSOURI.

## COMBINED AUTOMATIC SIGNAL AND CUT-OFF FOR TANK-FILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 736,152, dated August 11, 1903.

Application filed December 17, 1902. Serial No. 135,648. (No model.)

*To all whom it may concern:*

Be it known that I, WOLFGANG RENNER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in a Combined Automatic Signal and Cut-Off for Tank-Filling Apparatus, of which the following is a specification.

My invention relates to improvements in a combined automatic signal and cut-off for tank-filling apparatus; and my object is to produce an arrangement which is especially adaptable for use in breweries, where in the treatment of beer the latter is usually run from vats on the upper floor down through a series of tanks on the floors below before it is finally ready for the market. While thus filling a lower tank the greater portion of an experienced attendant's time is required to prevent the beer from overflowing into the sewer from the vent in the tank, as the usual means employed for ascertaining the quantity of liquid in the tank is by the sound produced by knocking on its side.

My apparatus prevents all loss from overflow and requires but little attention, as it may be set to automatically cut off the flow after the liquid has attained any desired depth within the tank and at the same time sound a signal for the notification of the attendant when said cut-off takes place.

The invention consists, substantially, in a cut-off, a primary vent which permits the air to escape from the tank while the latter is being filled and whereby the depth of the liquid within the tank is regulated, a secondary vent having connection with the cut-off and through which the air flows to operate said cut-off after the primary vent is closed by the liquid in the tank, and an audible signal which is also operated by the air flowing through the secondary vent.

In the accompanying drawings, which illustrate the invention, Figure 1 indicates a side elevation of a tank, partly broken away, provided with my improvement. Fig. 2 is an enlarged vertical sectional view of the primary and secondary vent, taken on line II II of Fig. 3. Fig. 3 is a plan view of the same. Fig. 4 is an inverted plan view of the vents, with the primary vent in cross-section. Fig. 5 is an enlarged vertical section of the cut-off valve and the signal. Fig. 6 is a vertical transverse section of the same, taken on line VI VI of Fig. 5. Fig. 7 is a transverse section of the signal, taken on line VII VII of Fig. 5.

1 indicates a tank of usual or any preferred construction, which is filled at the bottom through a hose 2, attached at its upper end to the bottom of another tank. (Not shown.) Tank 1 is provided at its top 3 with a threaded nipple 4, in which snugly fits a cylindrical shell 5, provided with a peripheral flange 6, adapted to be clamped upon an integral flange 7 in a bushing 8 by an internally-threaded nut 9, engaging the upper threads of the bushing and which is screwed down upon an interposed washer 10, provided to increase the friction upon the flange and prevent the shell from turning independently of the bushing, which latter is screwed down upon the upper threaded portion of the nipple, as shown in Fig. 2, a washer 11 being interposed between the top of the nipple and the under side of internal flange 7 to render the joint air-tight.

Shell 5, which forms part of the secondary vent, is divided into two compartments 12 13 by a cylindrical partition 14 and has a reduced upper threaded portion 15, provided with a nut 16 and washer 17, for frictionally securing the primary vent-tube 18, which extends through the inner compartment 12 of the shell, and has a valve-seat 19 and a basket 20 at its lower end, said basket carrying a ball 21, adapted to be elevated by the liquid entering the tank into contact with seat 19 to shut off the escape of air from the tank through the vent-tube, which latter may be raised or lowered, as indicated by dotted lines in Fig. 1, by loosening nut 16. After thus closing the primary vent-pipe to the escape of air the latter enters apertures 22, communicating with the lower end of compartment 13 and after passing up through said compartment enters two pipes 23, secured to the upper portion of the shell and united at their outer ends with a coupling 24, externally threaded to receive a coupling 25, secured to the upper end of a hose 26, which extends down to the lower portion of the tank and is coupled to the lower portion of a cylinder 27,

formed integral with shell 28 of the cut-off valve, said cylinder being closed at its top by a screw-cap $27^a$.

29 indicates a piston reciprocably arranged in cylinder 27 and provided at its under side with stop-pins 30, which limit its downward stroke to the top of inlet-port 31, so that the air entering therein from hose 26 will press upwardly against the entire under side of the piston and force it upwardly above exhaust-ports 32, where the air discharges through a whistle 33, that sounds the signal. As the piston is forced upwardly the upper end of its stem 34 contacts with the outer end of a lever 35, fulcrumed at 36 to a yoke 37 on top 38 of the shell, and causes the opposite end of the lever to press inwardly on the lower end of a dog 39, also fulcrumed to the yoke, which throws the upper portion of the dog out of engagement with a cross-head 40, secured to the upper portion of a stem 41, projecting from the top of plug 42, which latter is immediately forced down to its seat in shell 28 to cut off the flow of liquid into the tank by an expansion-spring 43, interposed between the top of the plug and the top of the shell.

The cut-off is opened by pulling upwardly on the cross-head until it is engaged by the dog, which latter is held in engagement until tripped by an expansion-spring 44, interposed between the dog and an adjusting-screw 45, engaging the internal threads of a boss 46, formed integral with the upper portion of one side of the yoke.

The lower opposite ends 47 of shell 28 are provided with swiveled couplings 48, composed of two sections 49 50, removably secured together by screws 51, and have internal threads 52 for engaging the coupling on the lower end of hose 2, and elbow 53, entering the lower end of the tank.

Elbow 53 is provided with a valve 54, which is closed after the plug in the cut-off valve has been seated, so the apparatus may be uncoupled at said elbow and nipple 4 and connected to another tank.

In operation after the primary vent-tube has been adjusted to admit the desired quantity of liquid into the tank the secondary vent is connected by hose 26 to cylinder 27, and plug 42 is locked in an elevated position by the dog to permit the flow of liquid from hose 2 into the tank. As the liquid rises in the tank the air therein is compressed and the greater portion of it is expelled through the primary vent-tube into the atmosphere until the liquid contacts with and elevates ball 21 to its seat and cuts off the avenue of escape through said primary vent. Then as the liquid continues to rise the air is forced through the secondary vent and down below piston 29, which it lifts above exhaust-ports 32, from which the air discharges through whistle 33, that sounds the signal. As piston 29 is lifted by the air its stem trips the locking mechanism supporting plug 42, which latter is immediately forced down to its seat by expansion-spring 43, and thus cuts off any further flow of liquid into the tank.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described, a shell open at its opposite ends to form a secondary vent, a cylindrical partition centrally disposed within the shell and open at its opposite ends to form a primary vent, a valve suitably secured to said primary vent for controlling the exhaust therethrough, and a cut-off valve suitably secured to the secondary vent and adapted to be operated by the passage of air through said vent.

2. In an apparatus of the character described, a shell open at its opposite ends to form a secondary vent and provided at one end with a reduced portion, a primary vent-tube extending through said shell and adjustably secured in the reduced portion thereof, a valve adapted to automatically close the primary vent-tube, and a cut-off valve suitably secured to the secondary vent and adapted to be operated by the passage of air through said vent.

3. A secondary vent comprising a shell having apertures communicating with the chamber therein, a flange formed integral with the shell, a reduced portion at one end of the shell, and pipes leading from the chamber in the shell and united at their outer ends; suitable means for securing the flange of the shell to the tank, a primary vent-tube secured in the reduced portion of the shell, a valve for closing said vent-tube, a cut-off valve coupled to the inlet-pipe of the tank, and a suitable connection between the outlet-pipes of the secondary vent and the cut-off valve, substantially as described.

4. A secondary vent suitably secured to the tank and comprising a cylindrical shell, a partition dividing the interior thereof into two chambers, the outer one of which has communicating apertures, an outlet-pipe leading from said outer chamber, and a reduced threaded portion formed integral with said cylindrical shell; a primary vent-tube extending through the reduced portion of the secondary vent, a valve for closing its lower end, a clamping-nut adapted to engage the threads of the reduced portion of the secondary vent, a cut-off valve coupled to the inlet-pipe of the tank, and a suitable connection between the outlet-pipe of the secondary vent and said cut-off valve, substantially as described.

5. A tank provided with a nipple, a secondary vent arranged therein and provided with a peripheral flange, a bushing secured to the nipple and provided with an internal shoulder upon which the flange is adapted to rest, a washer located on top of the flange and bushing, a nut engaging the upper threaded portion of the bushing for the purpose of forcing the washer in frictional contact with the top of the latter and the top of the flange, a primary vent suitably secured to the sec-

ondary vent, a cut-off valve, and a suitable connection between the secondary vent and said valve, substantially as described.

6. In an apparatus of the character described, a suitable vent secured to the tank, a hose communicating at its upper end with said vent, a signal to which the lower end of the pipe is coupled, comprising a cylinder, a piston reciprocably arranged therein and adapted to be elevated by the air entering the cylinder from the tank, a whistle communicating with the cylinder and adapted to be sounded by the air escaping from the latter, and a stem secured to the piston and extending through the cylinder; a cut-off valve coupled to the inlet-pipe of the tank and provided with a plug, a lock for securing said plug in an elevated position, and suitable means between the piston-stem and said lock whereby the latter is tripped when the piston is operated by the air entering the cylinder.

7. In an apparatus of the character described, a vent secured to the tank, an automatic cut-off valve coupled to the inlet-pipe of the tank, a cylinder formed integral with the casing of the cut-off valve, a pipe connection between said cylinder and the vent, a piston reciprocably arranged in the cylinder and adapted to be operated by the air entering the cylinder from the vent, a stem secured to the piston and extending through the cylinder, a cross-head secured to the plug-stem of the cut-off valve, a dog adapted to engage said cross-head for holding the valve in an open position, and a lever interposed between the piston-stem and the dog.

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

WOLFGANG RENNER.

Witnesses:
J. W. BOLING,
S. A. HICKEY.