(No Model.) 2 Sheets—Sheet 1.

H. E. BAILEY.

AIR PRESSURE BEER FORCING APPARATUS.

No. 531,494. Patented Dec. 25, 1894.

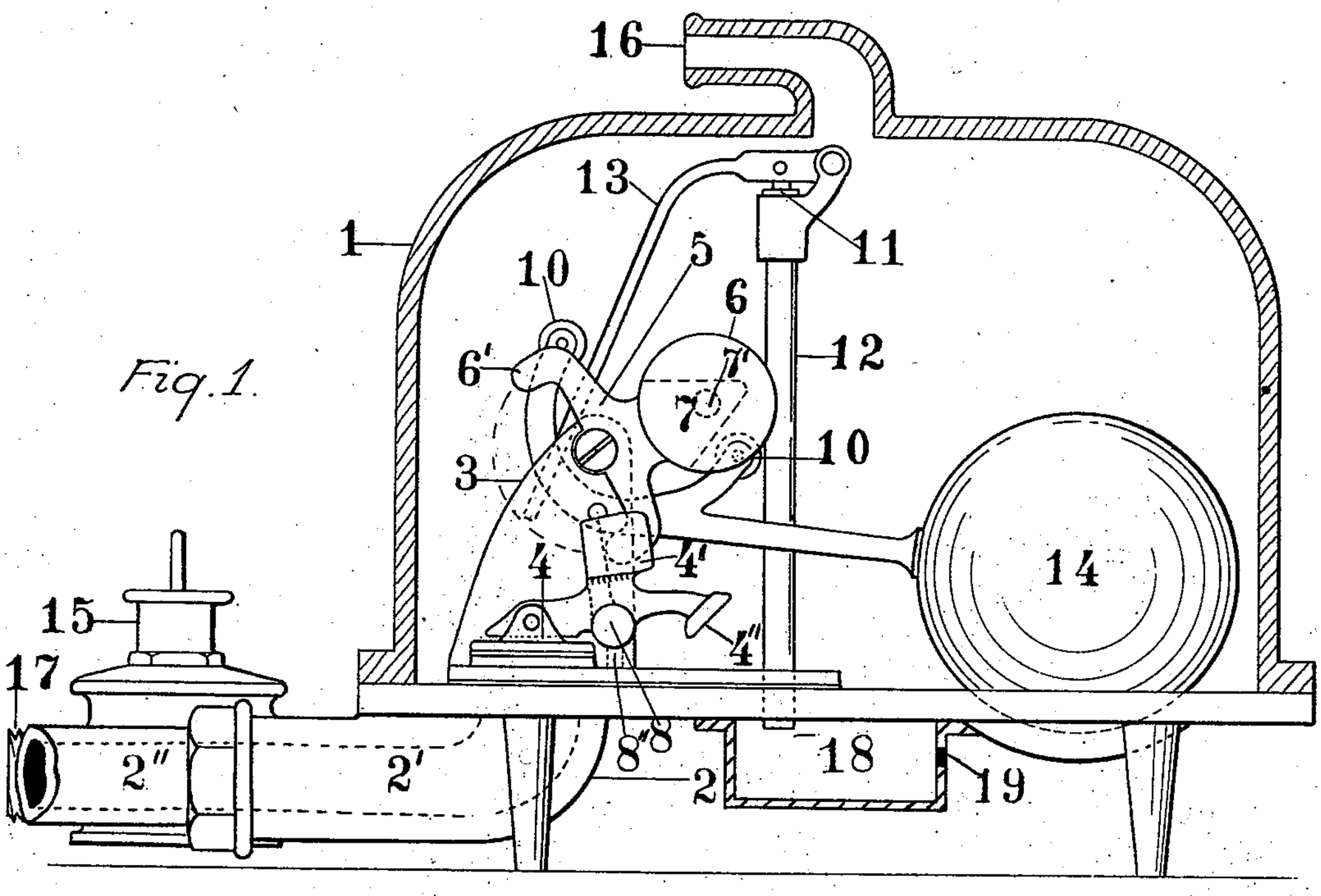

Fig. 1.

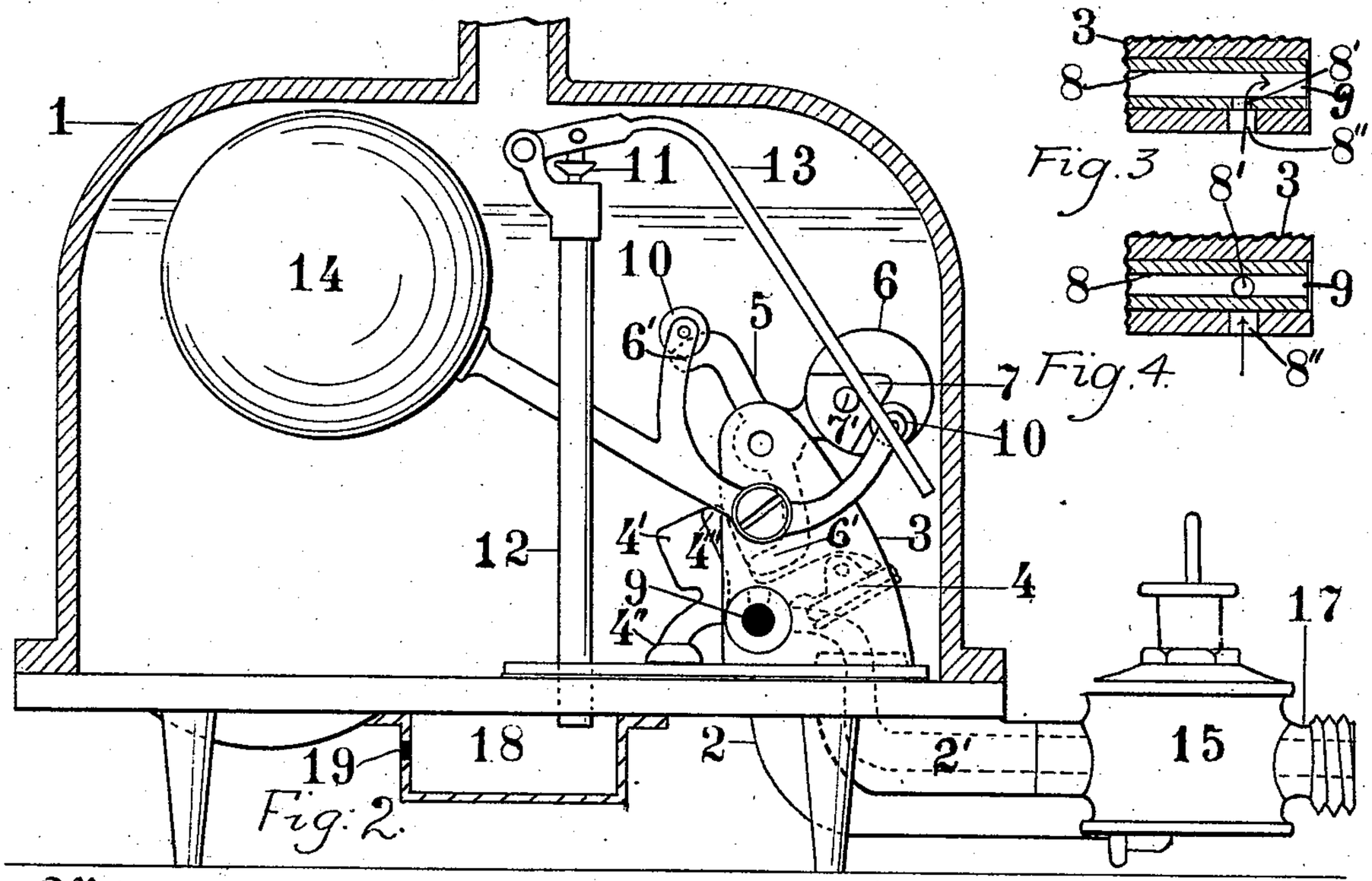

Fig. 2.

Fig. 3

Fig. 4.

Witnesses
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(No Model.) 2 Sheets—Sheet 2.

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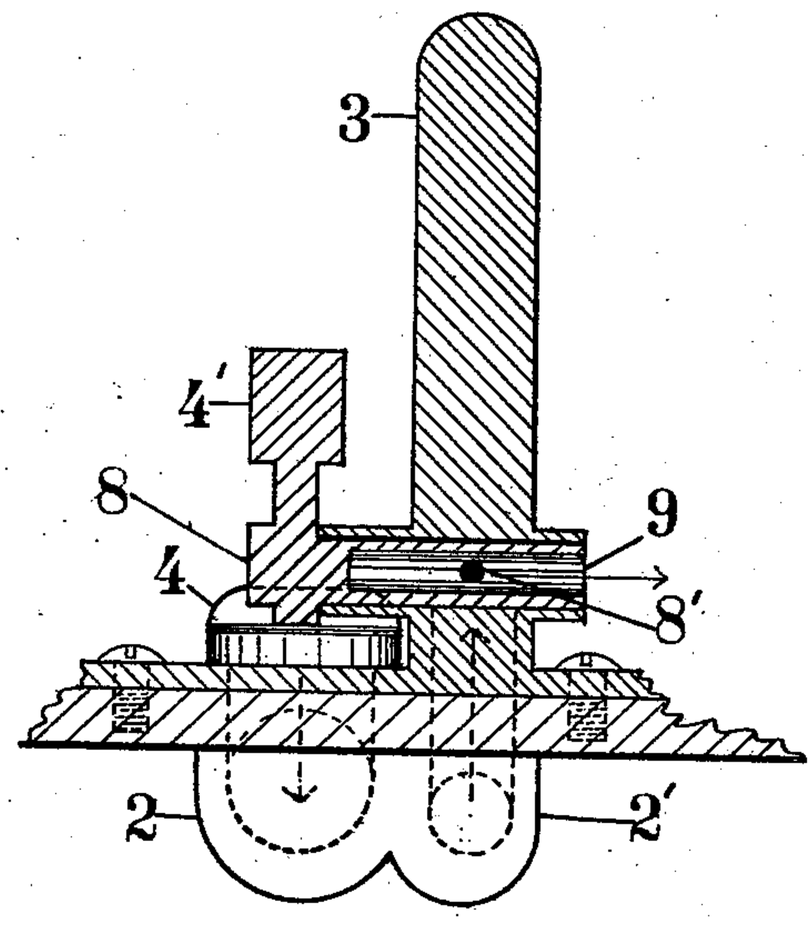

Fig: 5

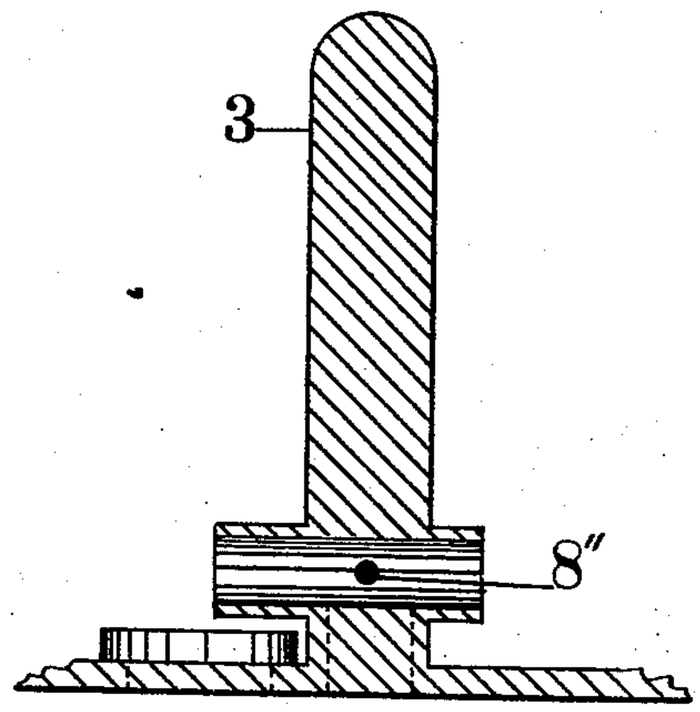

Fig: 6.

Witnesses
J. E. Harris:
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UNITED STATES PATENT OFFICE.

HENRY E. BAILEY, OF ALBANY, NEW YORK, ASSIGNOR TO THE COX BRASS MANUFACTURING COMPANY, LIMITED, OF SAME PLACE.

AIR-PRESSURE BEER-FORCING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 531,494, dated December 25, 1894.

Application filed March 14, 1894. Serial No. 503,532. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. BAILEY, a citizen of the United States, residing at Albany, Albany county, New York, have invented certain new and useful Improvements in Air-Pressure Beer-Forcing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a new and improved automatic air pressure beer forcing device.

In the drawings Figure 1 shows a vertical sectional view of the casing of my device with the operative portions shown in side elevation. Fig. 2 is a similar view showing the opposite side of the operative portions in the position assumed by them when the water is being discharged from the casing. Fig. 3 is a longitudinal sectional view of the rotary valve and a similar view of a portion of the standard forming a barrel in which the valve rotates, this figure showing the rotary valve open. Fig. 4 is a similar view thereof, showing the valve closed. Fig. 5 is a vertical sectional view of the intake water valve and its casing, and Fig. 6 a similar view of the casing with the valve omitted.

The numeral 1 shows the casing of my device, which may be of any desired material but preferably of cast iron and it is fastened to the base plate in any desired manner, preferably by screws or bolts, making an air and water tight joint. Under the base and preferably integral therewith, are the hollow offsets 2 and 2′, the opening in 2′ being in communication with the regulator 15 having a tube 17 connected therewith and having its outer end preferably threaded so as to be easily connected up with a water supply under pressure while the inner end of the opening in offset 2′ is in communication with the rotary valve 8, in order that the water under pressure from the water supply may pass through the regulator 15 and to the rotary valve 8. The relative positions of the hollow or tubular offsets 2 and 2′ will be seen by viewing Fig. 5, where they will be seen to lie side by side. The opening in offset 2 is in communication with flap valve 4 and with a discharge pipe arranged to discharge the waste water into a drain, sink or other waste water receptacle.

Rotary valve 8 is a tube preferably made integral with the lifting arm and weighted portion of flap valve 4, and passes through and makes a partial rotation in an opening or barrel in a portion of the standard 3, said barrel having an opening 8″ (see Figs. 3 and 4) in communication with the channel or opening in offset 2′ and in axial line with the opening 8′ in rotary valve 8 in order that when rotary valve 8 makes a partial rotation, opening 8′ is thrown in or out of register with opening 8″ thus admitting or cutting off the supply of water under pressure from regulator 15 as may be desired, said rotary valve 8 also forming a pivot on which flap valve 4 and its lifting arm rotates and is lifted and opened or falls and is closed.

Rotary valve 8 is closed at one end and open at the other, as seen at 9, the valve consisting preferably of a brass rod or arbor bored out for a portion of its length only. The standard 3 is integral preferably with a bed-piece, which bed-piece is removably attached to the base plate of casing 1 by screws preferably, as seen in Fig. 5.

To the rear of the lifting arm of flap valve 4 is a second arm 4″ which rises as flap valve 4 closes and falls as that valve opens, and in falling its end or foot strikes the base plate and rests thereon, limiting the rise of flap valve 4 and the rotation of rotary valve 8.

Above the rotary valve 8 and preferably integral therewith, is an extension 4′ of the arm 4″ and on the rear of 4′ is an offset 4‴ (see Fig. 2) against which the forks 6′ of the weighted trigger 6 strike as the trigger is operated, the blow of the fork 6′ operating the flap valve 4 and rotary valve 8.

To the upper portion of standard 3 is pivoted the weighted trigger 6, at the ends of arms 5 said trigger having forks 6′, the use of which is above described, and on the rear side of the weight is an inverted V-shaped offset 7 over and against which the friction reducing rollers 10 of the forks of the arm of the

float 14 pass as the float 14 rises and falls, thus operating the trigger 6 with the least possible friction. On the rear of the inverted V-shaped projection 7, projects a stud 7′ the use of which is hereinafter described.

Rising vertically, preferably, and passing through and attached to the base plate is the vent tube 12. At its top is an absorbent valve 11, made preferably of leather or other absorbent and lasting material in order that the moisture or water in the chamber of casing 1 may keep it swelled and somewhat soft, that it may always make a tight joint with its seat, experience having shown that non-absorbent material such as rubber, soon rots or deteriorates, after which it fails to make a perfect joint, and with metal valves, corrosion or a deposit of foreign matter thereon soon renders them practically inoperative. If preferred, the seat of the valve may be composed of absorbent material and the valve of non-absorbent material, but I prefer the arrangement of parts as shown and herein described. I have thus particularly set forth the construction and composition of this valve as it is vital to the working of all devices of the character herein shown and described; as, if this valve fails to work or soon deteriorates, or its action is impeded by corrosion or sediment, as is always the case with metal valves used in such devices, the whole apparatus becomes inoperative, as the compressed air is allowed to escape and repairs are rendered frequent, troublesome and expensive.

The valve 11 has a vertical valve stem as shown, to which the valve 11 is attached, the lower end of the stem dipping down into the mouth of the tube 12 and arranged so that its lower end never leaves the opening in the end of the tube, thus causing its lower end to act as a guide in seating the valve. The upper end of the valve stem is pivoted to the arm 13 and this arm projects far enough downward and outward so that when the trigger 6 is operated and thrown over, the projecting stud 7′ on the trigger 6 strikes against arm 13 and forces it to describe a portion of a circle, thus raising the valve 11, and when the trigger 6 is again operated and thrown in the opposite direction, the weight of arm 13 causes the valve 11 to close and holds it in that position until the trigger 6 is again operated and striking arm 13 again unseats the valve 11.

From the top, preferably, of casing 1, projects the tube or passage way 16, out of which flows the compressed air generated by my device. Tube 16 is connected with a beer keg or barrel by connecting a pipe or rubber hose to 16 and passing its other end into or in communication with the interior of the keg or barrel, both joints when such connection is made being air and liquid tight.

The float 14 is preferably made of hard rubber or other light and lasting material, and is hollow and attached to its arm in any well known manner.

The operation of my device is as follows:— Fig. 1 shows my device ready to receive a charge of water under pressure. Pipe 17 being connected with such a water supply, as with the city supply pipes, the water passes into and through the regulator 15 whereby the pressure can be regulated to any degree desired up to the full pressure in the supply pipes. As this regulator is similar to those now in common use a detailed description thereof is believed to be unnecessary. As the water passes through regulator 15 it passes through hollow offset 2′ to the rotary valve 8 and that valve being open it passes into the chamber in casing 1. As the water level rises in that chamber float 14 rises with its arm and throws the right fork of its arm with its friction reducing roller 10 against the under or right side of the inverted V-shaped projection on the rear of the weight on trigger 6. (See Fig. 1.) As the arm of float 14 continues to rise its left fork and roller rolls over the V-shaped projection, tipping or lifting the trigger 6 to a vertical position, and as it is forced beyond the vertical the weight causes it to fall by gravity and as it falls, stud 7′ strikes arm 13 pushing it outward and upward, opening valve 11 which gives a vent to the chamber while fork 6′ of the trigger 6 as it falls to its lowest limit strikes offset 4‴ on the arm 4′ of flap valve 4 causing that valve to rise and unseat, when the water will flow out of valve opening 4 and through hollow offset 2 and escape pipe 2″ to a drain or sink or other waste water receptacle and the chamber will fill with air through vent pipe 12 as the water passes out, and float 14 will fall. As it falls its left fork with its friction reducing roller 10 will strike against the left side of the inverted V-shaped offset and will first force the trigger 6 to a vertical position, when the weight will overbalance it and cause it to fall to the position shown in Fig. 1, and as it comes to the vertical, arm 13 falls, closing valve 11, and as it falls its right fork strikes the left side of projection or offset 4‴ and knocks or forces flap valve 4 down and closes it. As the beer is drawn from the keg or barrel the air pressure therein is reduced, when my apparatus will again automatically operate, keeping a sufficient air pressure in the keg or barrel to force the beer out.

Attached to the bottom of the base plate will be seen an air expansion chamber 18, the operation of which together with the vent pipe 12 is as follows: When the water fills the casing 1 as shown in Fig. 2, the air lying above the water line is compressed and as the float 14 rises to its highest point it operates the trigger 6, causing trigger 6 to open escape valve 4 and close inlet rotary valve 8, and also raises the arm 13 and vent valve 11. As vent valve 11 rises or opens the compressed air in the chamber above the water immediately rushes down pipe 12 into box 18, as this is the shortest and easiest exit for this compressed air and offers the least resistance to

its escape. After it has escaped the pressure in the casing 1 is reduced to the pressure of the surrounding atmosphere and the current of air therefore reverses and passes up pipe 12 and past valve 11, allowing the casing 1 to be filled with air at atmospheric pressure ready to be compressed when the valve 4 closes and valve 8 opens again, and as soon as the water enters casing 1 again it begins to compress the charge of air and the more it is compressed the tighter it closes valve 11 and it is thus confined in the casing and passes out and through nozzle 16 and its connecting pipe. In nozzle 16 or just beyond it in the mouth of the rubber tube connecting the nozzle 16 to the beer cask is a common check valve (not shown) which prevents the compressed air that has passed through the nozzle 16 from passing back again into the casing 1. This expansion chamber 18 being of considerable capacity in comparison with the vent pipe 12, the air under pressure entering it expands in the chamber and quietly passes out of opening 19, whereas without such a chamber 18 the air in escaping from the lower end of pipe 12 makes a very distinct and annoying hissing sound on each operation of the device, and when the air compression is considerable, say forty or more pounds per square inch, the noise of the escape without the expansion chamber is a very great objection to the use of the apparatus, as the noise of the escape is very frequent and distinct. My expansion chamber avoids this difficulty entirely.

What I claim, therefore, is—

1. In a device of the character described a water and air chamber containing an intake and a discharge water valve arranged to be opened and closed alternately at predetermined times in order that water may enter and compress the air in the chamber and then escape therefrom, and a vent device in said chamber arranged to discharge the compressed air therein into an expansion chamber during the time the water is escaping from the chamber, said expansion chamber having an opening in communication with the surrounding atmosphere, substantially as described.

2. In a device of the character described an air and water chamber as —1— a standard as —3— in said chamber removably attached to the air and water chamber, standard —3— having a valve casing and a port as —8″— in communication with a body of water under pressure, and a rotary valve as —8— in said valve casing and a flap valve as —4—, the rotary valve as —8— arranged to act as a pivot by means of which the flap valve is opened and closed and a weighted trigger as —6— and a float as —14— arranged to operate said trigger, said trigger arranged to open and close the rotary valve and flap valve alternately when the trigger is operated and having a vent device as —11—12—13— arranged to be operated by said trigger and an expansion chamber as —18— into which the vent device discharges, said expansion chamber being open to the atmosphere, substantially as described.

3. In a device of the character described an air and water chamber as —1— a standard as —3— in said chamber removably attached to the air and water chamber, said standard having a valve casing, and a port —8″— in communication with a body of water under pressure, and a rotary valve as —8— in said valve casing and an outlet valve as —4— the rotary valve arranged to act as a pivot by means of which the outlet valve is opened and closed, and a weighted trigger as —6— and a float as —14— arranged to operate said trigger, said trigger arranged to open and close the rotary valve and outlet valve alternately when the trigger is operated and a vent device as —11—12—13— arranged to be operated by said trigger substantially as described.

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

HENRY E. BAILEY.

Witnesses:
J. F. HARRIS,
W. M. BROWN.