(No Model.)

T. B. CARROLL.

AIR PUMP AND VENT.

No. 351,358. Patented Oct. 26, 1886.

Fig. 1.

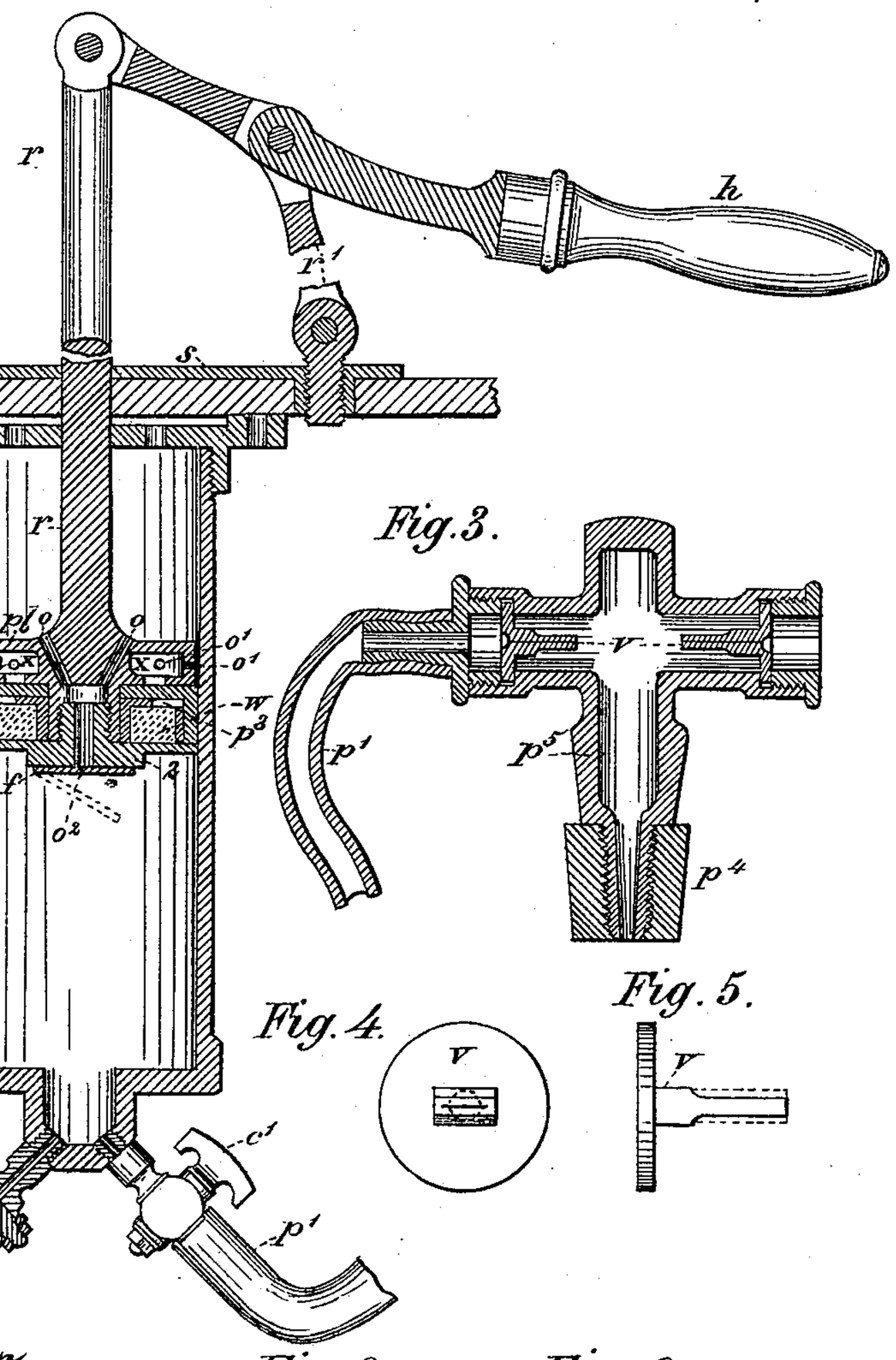


Fig. 2.

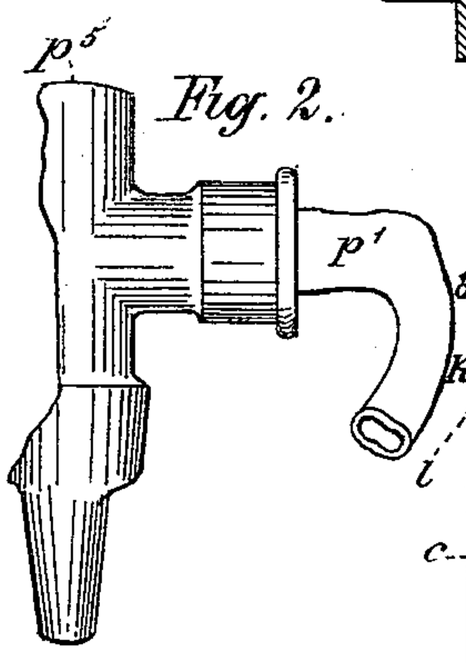


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

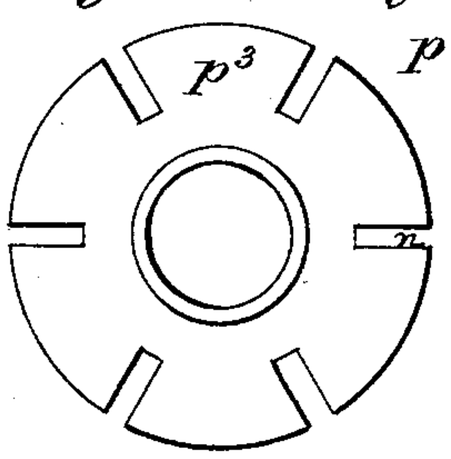


Fig. 7.

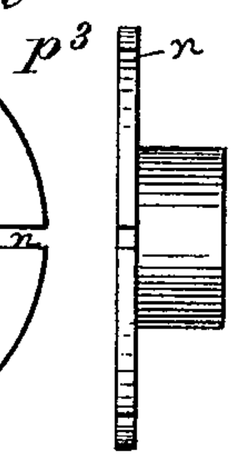


Fig. 8.

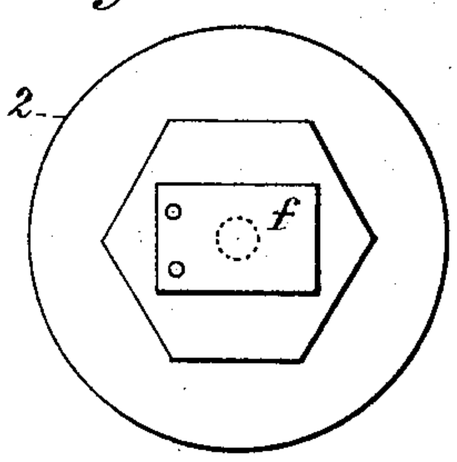
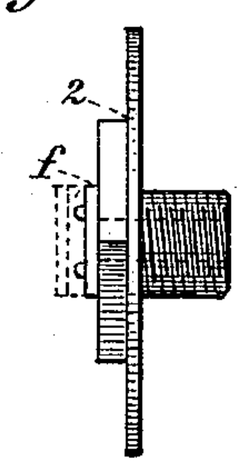


Fig. 9.



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UNITED STATES PATENT OFFICE.

THOMAS B. CARROLL, OF INDIANAPOLIS, INDIANA.

AIR-PUMP AND VENT.

SPECIFICATION forming part of Letters Patent No. 351,358, dated October 26, 1886.

Application filed May 8, 1886. Serial No. 201,625. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. CARROLL, a resident of Indianapolis, Indiana, have made certain new and useful Improvements in Air-Pumps and Vents, a description of which is set forth in the following specification, reference being made to the accompanying drawings, in the several figures of which like letters represent like parts.

My invention relates to the construction of an automatic venting air-pump intended to be attached by means of suitable pipes and nozzles to kegs containing beer or any other liquid undergoing fermentation, and will be understood from the following description.

In the drawings, Figure 1 represents a front view of my device, mostly in vertical section, with portions of the pipes attached, the pump-cylinder being connected so that the plunger-rod passes through the refrigerator or box in which the kegs are kept. Fig. 2 is a detail view of one of the plugs with a part of the pipe attached. Fig. 3 is a vertical section of the same, showing the valves within, and showing also the double-ended bung. Fig. 4 is a top view of the rubber valve, and Fig. 5 is a side view of the same. Fig. 6 is a top view of the metal plate which stops the cavity in the head of the plunger. Fig. 7 is a side view of the same. Fig. 8 is a bottom view of the plate 2, showing the flap-valve *f;* and Fig. 9 is a side view of the same.

In detail, *c* is the cylinder in which moves the plunger p', connected to the rod r, which passes through the cap of the cylinder and the wood frame f' of the ice-box, and through a scutcheon-plate, *s*, fastened on the outside of the box, and is connected at the end of the handle *h*, which in turn is connected to the frame-work of the box, near midway, by the rod r', and to which is attached a screw for passing into the wood. The upper part of the plunger is formed of metal and is integral with the rod r, and has two air-openings, *o*, which are bored at angles, so as to open into a larger opening formed in the projecting under part of the plunger, which opening is threaded to receive a screw cut on a boss formed on the bottom plate, 2, which is provided with a central opening, o^2, covered by the flap-valve *f*, as shown in Figs. 8 and 9. Air then is free to pass through the plunger by means of the opening *o* and the lower opening, o^2, directly into the cylinder below, except when stopped by the pressure upon the flap-valve *f*. The plunger-head is formed with cavities *x*, through which small holes o' are bored to the peripheries of the plunger. These cavities are intended to be filled with oil for lubricating the sides of the cylinder, so as to always keep it moist and not allow it to become dry. This part of the plunger is covered by the back of the leather cup *l*, which is filled with cotton saturated with lubricating material, that keeps the leather always moist and in proper condition for work. The plate p^3 is placed in the bottom of this leather cup, and around this plate is an expansion-ring, *k*, made of metal, which keeps the leather cup out in shape. The bottom plate, 2, is then screwed on, serving as a cover over the leather cup, its projecting boss entering the threaded opening in the under part of the plunger, and at the bottom of this plate is placed the flap-valve *f*. It will be seen by this arrangement that the oil from the cavities *x* in the head of the plunger, passing through the small openings o', will lubricate the sides of the cylinder, and enough oil may be put into the cavities *x* to last a long time without renewal.

To the bottom of the pump-cylinder are screwed metal connections provided with cocks c' and c^2, and to these connections are attached flexible pipes p' and p^2, which lead to the kegs containing the fermenting liquid. To the end of each of these pipes is connected a double-armed plug, as shown in Figs. 2 and 3, which is constructed as follows: The pipe p' is slipped over a projection on one arm of the plug, and the other arm of the plug has a cap provided with a central opening to admit air. In each arm of this plug is placed one of my rubber valves *v*, which is composed of a round head, forming a washer, and a thin body having an opening through its entire length, as shown in Figs. 4 and 5. These valves are shown in place in Fig. 3—one of them on the vent side and the other on the side to which is attached the pipe leading from the air-pump. The bottom part of this plug is preferably made double, as shown in Fig. 3, so as to fit the different sizes of openings in the bung or keg. For instance, the shape

shown in Fig. 2 will fit the opening of one of the bungs very commonly used; but where this kind of a bung is not used the sleeve p^4 is secured on over the smaller taper p^5, and this sleeve, being larger, will fit the ordinary opening made in the side of or in the end of the keg. The small part of this plug is usually threaded to receive this additional sleeve, as shown in Fig. 3, and by removing this sleeve the small taper will fit the opening in an ordinary bung; but where the opening in the bung is too large for the small taper of the plug the outer portion may be screwed on and used.

Each one of the pipes p' and p^2 leads to a separate keg, and each, as has before been said, is connected with one of the double-armed plugs, as shown in Fig. 3, and in each one of the arms is one of the valves v, and either one or both may be used at the same time; or when one is not necessary to be used it may be cut off by means of the cock on that side.

My device operates as follows: When applied to a fresh keg of beer it is not necessary to use the pump at all, as the keg in such condition only needs venting, and in that case the absence of pressure upon the liquid in the keg will cause a vacuum in the opening of the plug, and will open the lips of the valve v on the vent side of the plug, and air will be admitted to the keg. When sufficient air has been admitted equilibrium will be restored, and after some of the beer has been drawn off, and the carbonic-acid gas is likely to escape, the carbonic-acid gas is kept in the beer by the pressure of the air forced into the keg through either one of the pipes, and through the valve on that side. The flap-valve f is simply a piece of leather or rubber fitted on the under side of the projection on the plate 2, and the pressure from below will close it, and pressure from above will open this valve, so that when there is sufficient pressure in the keg no air can enter through the plunger or vent, but if there is not, air can be admitted. I thus provide a plunger which contains within itself means of lubricating the parts and preventing them from becoming dry, and I also provide connection to two or more kegs with plugs of peculiar construction adapted to fit the different-sized openings in the kegs, and having arms, to one of which is connected the pipe leading to the air-pump, and to the other side is a vent leading to the beer undergoing fermentation, each one being provided with the peculiarly-constructed valve herein shown, which is automatically opened and closed, as hereinbefore described.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. A plunger for an air-pump, connected with the rod above and having oil-cavities in the upper portion thereof, with outlets from such oil-cavities to the sides of the cylinder, and receptacles in the lower part of the plunger to receive an absorbent material carrying a lubricant for keeping the sides of the leather packing soft, all combined substantially as described.

2. The plunger-head p', through which pass the oblique openings o, the plate p^3, provided with notches n, the expansion-ring k, the leather packing l, the fibrous material w, contained therein, and the bottom plate, 2, having a projecting boss threaded to enter a corresponding opening in the base of the plunger for uniting the parts together, and provided with the valve f, all combined substantially as described.

3. The double-armed plug herein described, containing the valves v, having elastic necks and washer-heads, one in each arm of the plug, the removable collar p^4, connected with the tapering end of such plug, and an elastic pipe connecting one end of the plug with the cylinder of an air-pump, all combined substantially as described.

4. The plug p^5, having the removable collar p^4 connected to its lower end, and side arms inclosing the valves v, having a flexible neck and a washer-head, and a longitudinal opening throughout, one of these arms open at the end above the valve to receive air from the outside, the other connected by a suitable pipe to the cylinder of an air-pump, and such air-pump, all combined substantially as described.

In witness whereof I have hereunto set my hand this 28th day of April, 1886.

THOMAS B. CARROLL.

Witnesses:
C. P. JACOBS,
HATTIE HENRY.