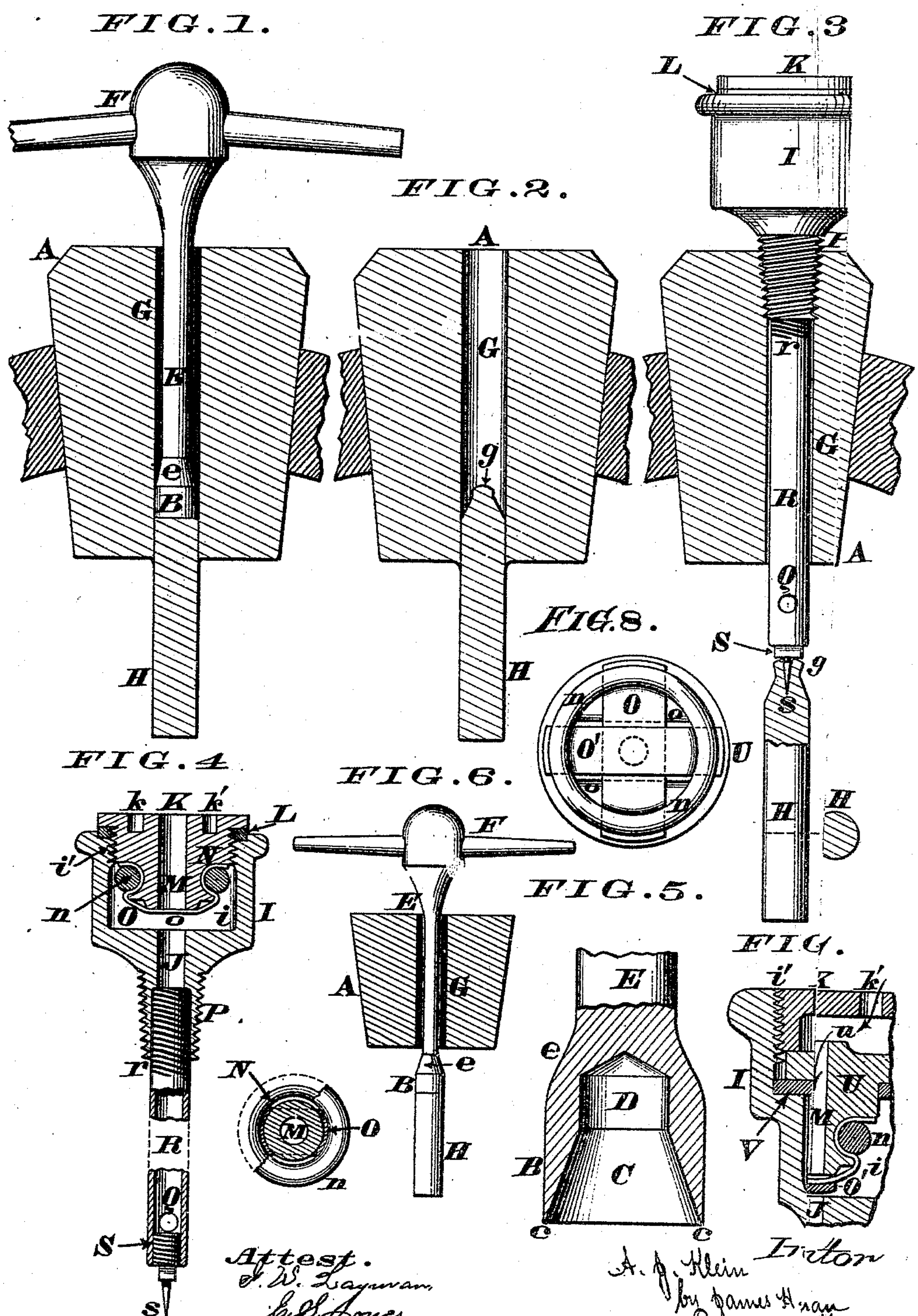
A. J. KLEIN.

PROCESS OF VENTING BARREL-BUNGS.

No. 194,441. Patented Aug. 21, 1877.



Attest.
J. W. Layman,
C. S. Jones.

A. J. Klein Inventor
by James [illegible]
Attorney.

UNITED STATES PATENT OFFICE.

ALOIS JOSEF KLEIN, OF CINCINNATI, OHIO.

IMPROVEMENT IN PROCESSES OF VENTING BARREL-BUNGS.

Specification forming part of Letters Patent No. **194,441**, dated August 21, 1877; application filed June 4, 1877.

To all whom it may concern:

Be it known that I, ALOIS JOSEF KLEIN, of Cincinnati, Hamilton county, Ohio, have inveneed a certain new and useful Process of Venting Barrel-Bungs, of which the following is a specification:

The usual method of venting a bung is to bore a longitudinal channel through it, and then insert in said channel the stem or tube of an automatically-operating air-valve, or the same result is sometimes accomplished by providing such stems or tubes with gimlet-points for boring the bungs. In either case, however, the fine dust or borings or splinters made by the penetrating-implement invariably fall into the keg or barrel, thereby filling the faucet with obstructions, and rendering it impossible to draw off the beer or other liquor.

The object of my invention is to channel the bung and insert the air-valve without allowing such obstructions to drop into the barrel, and I accomplish this result in the following manner:

I first make use of a peculiarly-constructed punch, which is applied to the outer end of the bung, and then operated upon so as to drive its lower or cutting end almost, but not entirely, through the bung. This act causes a cylindrical plug to be formed within the body of the bung, and to emerge from the lower end of the same, the diameter of said plug being equal to the diameter of the cutting-edge of the punch. This plug is not driven completely out of the bung, but its upper end remains seated in the lower portion of the channel until it is dislodged therefrom by the application to the bung of the stem of a suitable air-valve. Now it is evident that this dislodgment of the plug from the bung would cause the former to drop into the liquor unless some provision were made to prevent such a contingency. This difficulty is obviated by applying to the lower end of the air-valve stem a pin or prong or spur that penetrates the upper end of the plug and allows the latter to depend securely from said stem, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical section, showing the punch in the act of being driven into the bung. Fig. 2 is a similar section, showing the shape of the channel and plug after the punch has been withdrawn from the bung. Fig. 3 is another vertical section, showing the air-valve applied to the channeled bung, and the now detached plug suspended from the prong of said air-valve stem. Fig. 4 is an axial section of the air-valve and its accessories. Fig. 5 is an enlarged axial section of the lower end of the punch. Fig. 6 represents the method of using the punch when the plug is driven completely through the bung. Fig. 7 represents a modification of the air-valve. Fig. 8 is an enlarged plan of the duplex diaphragm of the air-valve.

A represents an ordinary wooden bung, which is applied in the usual manner to a barrel or keg or other receptacle for containing liquor on tap. In order that a saloon-keeper may vent said bung in the most expeditious and convenient manner, I provide a peculiar punch, which is constructed as follows: B represents the lower portion of said punch, which portion is cylindrical, and is chambered out at C to afford a cutting-edge, *c*, as more clearly shown in Fig. 5. This outwardly-flaring chamber C preferably communicates at top with a cylindrical bore, D, for a purpose that will presently appear.

The punch is reduced in diameter at *e*, which diminished part joins the shaft E, said shaft being provided at top with any suitable handle, F, or other convenient retracting device or appliance. By making these portions E *e* of relatively less diameter than cutter B C *c* the punch can be readily withdrawn from the bung after the channel has been made in the latter.

To form such channel the punch is applied to the exposed end of the bung and near the center of the same, when a few smart blows with any suitable implement drives in the cutting-edge B *c* as far as may be desired. It is not designed, however, to force the cutter B *c* completely through the bung, but it should stop short of the lower end of the same, a distance, say, of from one-fourth to one-half of an inch, and as soon as the punch has penetrated thus far it is then retracted by means of handle F.

The condition of the bung immediately after this retraction of the punch is seen in Fig. 2, and by referring to the said illustration it will be noticed that the upper portion of the bung is traversed with a longitudinal channel, G, of the same diameter as punch-cutter B *c*.

It will also be seen that the lower end of said channel G is closed with a stump, *g*, that was made by the chambered portions C D of the punch.

Furthermore, it will be noticed that the upper portion of plug H remains in the channel, while the principal part of said plug projects from the lower end of bung A. This plug H was formed by the material punched out of channel G, and consequently said plug is of the same diameter as cutter B *c*.

It will be observed, however, by referring to Fig. 3, that the plug H is not quite as long as the channel G, within which it was formed, as a very perceptible compression of the wood takes place at the upper portion of said channel before the lower end of the plug begins to emerge therefrom.

Now, as long as the bung remains in the condition shown in Fig. 2, the portion of the plug seated in channel G will prevent the escape of gas through the latter; but it is designed to apply an air-valve to said channel as soon as it is formed, and before its area is diminished by any swelling of the wood.

Any approved form of automatic air-valve may be employed for this purpose, provided its lower and perforated end projects through the bung; but I prefer to use a special valve, whose construction is shown in Figs. 3 and 4. Said valve consists, essentially, of a shell or case, I, chambered at *i*, screw-threaded at *i'*, and provided with an axial bore, J. Screwed into this shell is a cap, K, having sockets *k k'* for the reception of a wrench, wherewith said cap may be forced down tightly against the gasket L. M is the air-inlet of this cap, said inlet being in line with the bore J. The lower portion of this cap is scored with an annular groove, N, into which is sprung an elastic ring or band, *n*, which clamps to said cap a yielding diaphragm, O, that covers the orifice in raised seat *o*. This diaphragm is maintained snugly against said seat as long as the pressure of gas in the barrel or keg exceeds the external pressure of the atmosphere. The lower end of the shell terminates with a neck having a right-hand thread, P, cut around it, which thread is capable of ready engagement with the upper portion of channel G, as seen in Fig. 3. Screwed to this neck, with a left-hand thread, *r*, is a tube or stem, R, whose lower end is closed with a stopper, S, having a left-hand thread cut around it. Formed with or rigidly attached to this stopper is a prong or spur, *s*, sharpened at its lower end.

Located above said stopper are apertures Q communicating with the interior of stem R.

As soon as the above-described air-valve is applied to the bung A the stem R traverses channel G, and spur *s* penetrates the upwardly-projecting stump *g* of plug H. The exertion upon cap K of a slight degree of force dislodges the plug H from channel G, which plug is now securely suspended from prong *s*, as seen in Fig. 3. Neck P is then screwed into the upper part of channel G, which act completes the application of the air-valve to the bung A.

As no litter of any kind is made during the operations of forming and ejecting the plug H, and as said plug is securely suspended within the barrel, it is evident the act of venting the bung is accomplished without dropping dust or splinters, or similar obstructions, in the liquor, and, consequently, there is no danger of the faucet becoming choked up by the introduction into the same of fragments of the bung.

When liquor is drawn off the air-valve acts precisely the same as all other similar devices, the flexible diaphragm being depressed from its seat *o* to admit air at proper intervals.

After the keg has been emptied the air-valve is removed from the bung, and then it is immaterial whether the plug H drops into the barrel or not, as ample opportunity is afforded for the removal of said plug previous to the keg being refilled.

In case plug H should be driven completely through the bung, as seen in Fig. 6, said plug can be instantly retracted with the punch, so as to close temporarily the channel G until the air-valve is applied thereto, as previously described. It is evident, however, that whichever process is employed the result will be the same in either case—that is to say, no splinters, dust, or other litter will drop into the liquor, and obstruct the flow through the faucet or other device employed for emptying the keg of its contents.

The air-valve may be modified in its construction, as seen in Fig. 7, in which illustration cap K is represented as provided with a depending flange, T, that bears against the inner and detachable member U, which member has the yielding diaphragm secured to it, and is seated upon a gasket, V.

The sockets *k k'* are carried through said cap, so as to serve as air-inlets. The channel M of this inner member U passes through a central raised boss, *u*, and as said inlet is not in line with the ones *k k'* it is evident no dust or dirt can enter the device and interfere with the working of the diaphragm.

This illustration shows the air-valve as constructed with two diaphragms, O O', of which the inner one, O, is made of lighter material than the outer one, O'. This arrangement renders the diaphragm extremely sensitive to the entrance of air, while at the same time the extra thickness of rubber prevents the latter being cut to pieces by being forced into the lower end of channel M in event of any excessive pressure of gas within the keg.

Bore D may be omitted without materially diminishing the efficiency of the punch.

The right is reserved of embodying in a fu-

ture application for patent the peculiar construction of air-valve herein illustrated and described.

I claim as my invention—

1. The within-described process of venting bungs, which process consists in forming a channel longitudinally of the bung by punching a plug a suitable distance out of the same, and then applying to said channel the stem of a suitable air-valve, so as to dislodge said plug, and cause it to be suspended from said stem, for the purpose set forth.

2. The cylindrical and chambered punch B C *c* for forming a channel in a vent-bung, said punch being constructed either with or without the bore D, and being provided with a shaft, E, of relatively less diameter than the cutter B C *c*, in order that the punch may be readily withdrawn from the channel, substantially as herein described and set forth.

3. The prong *s*, projecting from the lower end of an air-valve stem for suspension of the plug ejected from the channeled bung, substantially as herein described, and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

ALOIS JOSEF KLEIN.

Witnesses:

JAMES H. LAYMAN,

L. H. BOND.