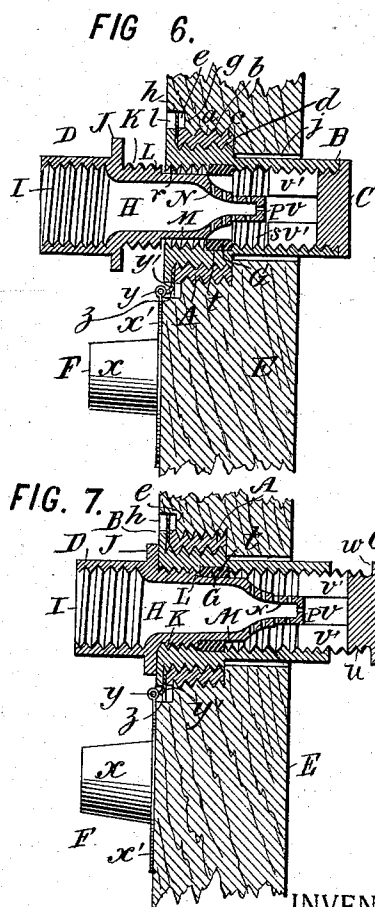
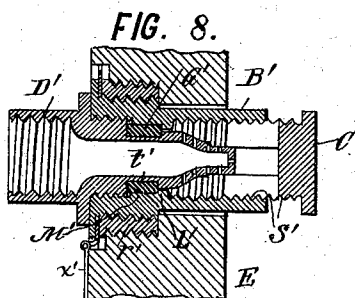
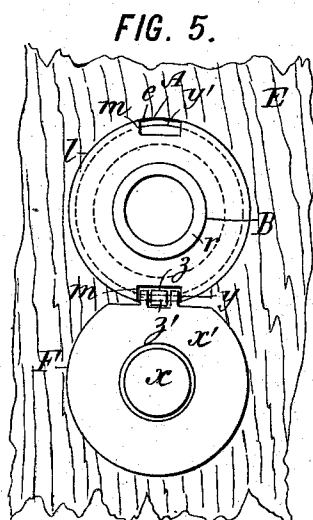
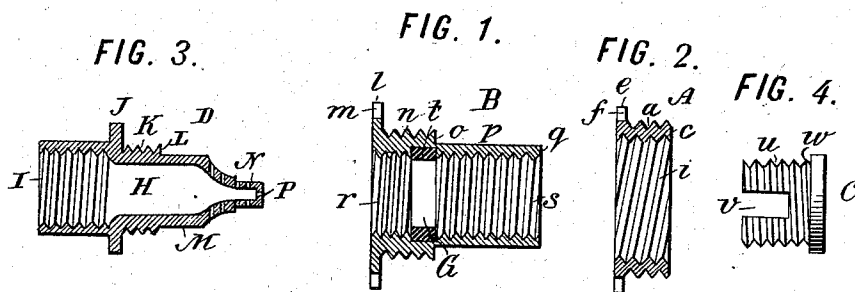


(No Model.)

W. H. FOSS.
TAP OR OTHER VALVE.

No. 558,020.

Patented Apr. 7, 1896.



WITNESSES:

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TAP OR OTHER VALVE.

SPECIFICATION forming part of Letters Patent No. 558,020, dated April 7, 1896.

Application filed October 18, 1894. Serial No. 526,301. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. FOSS, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Taps and other Valves, of which the following is a specification.

This invention relates to taps and other valves, and particularly to taps or faucets for withdrawing liquids, such as beer, ale, and the like, from casks or other receptacles.

Heretofore one such tap has consisted of a thimble screwing into the head of the cask, and a barrel screwing into this thimble and having concentric screw-threads and a valve-seat on its inner end, the smaller and inner screw-thread engaging the screw-threaded end of a plug acting against said seat to close the valve, and the larger and outer screw-thread receiving a similarly-screw-threaded shank of a tubular key, the end of which, by engaging a groove in the plug, screwed the latter to the open position simultaneously with the inward screwing of the key and to the closed position as the key was unscrewed. Such a construction is shown in the application of Louis Crabtree, filed January 22, 1894, Serial No. 497,737, with which my present improvements are particularly advantageous of employment. In such devices the difference in diameter between the inner screw-threads of the barrel or cylinder and the consequent difference in size of the screws necessary to give the same speed of movement to the key and plug and to bring the end of the former exactly into coincidence with the notch of the latter as it takes its screw-thread require the exercise of much fine workmanship in the construction of the parts; and it is found that when liquids are under heavy pressure there is a considerable leakage prior to the completion of the opening or the closing operation.

My present improvements are designed to avoid these objections and to improve the construction and operation of the tap or valve.

To this end, according to one feature of the invention, I construct the cylinder or barrel of the valve with a single or like screw-thread for both the plug and key, preferably tapping this thread at one operation and with one tool, and I provide a packing between the

cylinder and key, preventing leakage during the operation of opening or closing, and I provide an attached protecting cork or cover for use to close the cylinder when the key is removed therefrom, as in transportation.

In the accompanying drawings, which show my invention as applied to a beer-tap, Figure 1 is an axial section of the barrel or cylinder alone. Fig. 2 is a like section of the thimble therefor. Fig. 3 is a like section of the key. Fig. 4 is a side elevation of the plug. Fig. 5 is a front elevation of the tap, showing a fragment of the head of a barrel. Fig. 6 is a vertical axial section thereof, showing the tap in the closed position. Fig. 7 is a similar view showing the tap in the open position, and Fig. 8 is a similar view showing a modification.

Referring to the drawings, let A indicate the thimble; B, the cylinder or barrel; C, the plug; D, the key; E, a fragment of the head of a cask, and F a stopper or cover.

As heretofore, the thimble A has an external screw-thread *a* screwing into a hole *b* in the head E, an inner end *c* abutting against a shoulder *d* in said head, a flange *e* on its front having screw notches or holes *f* to permit of turning the thimble and having an inner face engaging a shoulder *g* in the head E, and a flat outer face which, when the thimble is screwed home, lies within a recess *h* in said head. Internally the thimble is traversed by a screw-thread *i*, which according to one feature of my improvements is a double or multiple thread.

The head E is bored with the recess *h*, shoulder *g*, socket *b*, shoulder *d*, and reduced concentric hole *j*, extending from the latter shoulder to the inner side of the head, which hole is of less diameter than the inner diameter of the screw-thread *i*, so that the shoulder *b* extends inwardly of the inner edge of the thimble, as heretofore.

The cylinder B has a flat external flange *l*, having screw-notches *m*, flat front and rear faces, and corresponding in size with the flange *e* of the thimble, against which it moves when the thimble and cylinder are screwed together. Immediately at the inner side of this flange the cylinder has the usual screw-threaded portion *n*, terminating in a shoulder *o*, which portion is of sufficient

length to screw into and slightly through the thimble A and engage the shoulder *d* of the head E when the tap is applied to the cask as usual. According to my invention the screw-thread on the portion *n* is a double or multiple thread corresponding to the screw-thread *i* on the inner sides of the thimble. From the shoulder *o* inwardly the cylinder preferably has a smooth cylindrical portion *p* of slightly less diameter than the hole *j* through the head, projecting through this hole and at its inner end having a flat or otherwise suitably formed valve-seat *q*.

According to one feature of my improvement the cylinder B is constructed internally with outer screw-thread *r* and inner screw-thread *s*, both identical in diameter and pitch, and preferably both forming part of a single screw-thread tapped entirely through the interior of the cylinder, and according to another feature the cylinder is provided with an internal cylindrical packing-surface *t*, preferably in the form of a groove, the front and rear walls of which form lateral shoulders at the sides of the surface, and a suitable packing-ring G is provided at this surface adapted to embrace it and a corresponding surface on the key D. The plug C is of usual construction, having an external screw-threaded stem *u* fitting and entering the inner end of the screw-thread *s* of the cylinder, which stem is traversed by a wide key groove or slot *v*, and carries at its inner end a square or otherwise suitably formed head *w*, which, when the stem is screwed home in the cylinder, engages the seat *q* thereof and makes a tight closure therewith. When the stem is screwed out, the ducts or notches *v v'* pass beyond the seat, thus opening communication to the inner end of the cylinder.

The key D is, in general, of usual construction, having a tubular interior H, any suitable discharge end I, an external flange J, embracing the flange *l* of the thimble when the key is screwed home therein, an outer screw-thread K, fitting and entering the thread *r* of the cylinder, corresponding in length to the length of such thread and terminating in a shoulder L, from which shoulder, according to my invention, the key is constructed with a cylindrical or slightly-tapered packing-surface M, beyond which it has a strainer-neck N and a squared head P, which latter fits and enters the notch *v* of the plug C. When the key is applied to the cylinder, its inner end is passed within the packing G, its surface M slides through the interior of the packing, making a tight fit, until its head P abuts against the inner end of the plug C, at which time its shoulder L is in close proximity to the front face of the flange of the thimble. The key is then rotated until its head is in line with the notch *v*, at which time the starting-point of its thread has made and coincides with the starting-point of the screw *r* and permits the two threads to be brought into engagement. The inward push bringing the

threads together moves the head into the notch, whereupon as the key is turned and its thread K fits in on the thread *r* it will simultaneously turn the plug C, unscrewing its thread *u* from the thread *s* at the same speed at which it is itself screwed in. During the inward movement of the key, from the time its surface M enters the packing-ring G until the opening operation is completed, there is a tight joint formed by the packing-ring between the key and cylinder, so that no leakage occurs. When the key is screwed completely in, its shoulder L embraces the outer edge of the packing-washer G, and compresses the latter between such shoulder and the opposing shoulder of the groove *t*, thus tightly compressing the packing-ring between the packing-surfaces.

In the operation of closing the valve the surface M does not leave the interior of the packing-ring until the plug C is tightly closed, at which time the threads K and *r* are in position for disengaging, when the key can be withdrawn by an outward pull sufficient to overcome the frictional engagement between the inner end of its packing-surface and the packing-ring G.

The packing-ring G may be of any suitable material or desirable shape, and may be stationarily disposed on either member and adapted to act against a packing-surface on the other. For this purpose it is best to construct the member carrying the ring with a groove fitting the latter, and the member moving relatively to the ring with an elongated surface, cylindrical or slightly tapered, equaling in length the distance of the relative movement of the parts, and permitting the rotation of one relatively to the other. In the construction shown in Figs. 1 to 7, inclusive, the member carrying the packing-ring is the barrel or cylinder and the member moving relatively to it the key. An opposite arrangement is shown in Fig. 8, in which the key (lettered D') carries the packing (lettered G') in a groove (lettered *t'*) near the forward end of the key, and the cylinder (lettered B') has a cylindrical surface (lettered M') terminating in a shoulder, (lettered L',) over which surface the packing slides and rotates as the key is passed into or out of the cylinder. The screw-threads (lettered *r'* and *s'*) are in this instance identical in diameter and pitch, but are tapped from opposite ends of the cylinder because of the intervening surface M'.

Another feature of my invention consists in providing a detachable cover F for closing the open end of the cylinder B when the key is removed from the latter. As shown, this consists of a cork *x*, fitting the screw-threaded aperture *r* in the end of the cylinder, and carried by a cover or plate *x'*, pivoted on a pin *y* and swinging from a position in front of the cylinder to one away therefrom. To removably attach the cover, I provide a flat ring-like piece *y'*, fitting over the portion *n* of the cylinder and clamped between the flange

h of the latter and the flange e of the thimble A when these parts are screwed together, which piece y' has an outwardly-bent arm z, passing out through one of the screw-notches
 5 m of the flange l, and having at its outer end an eye z', embracing the pivotal pin y of the cover x'.

In operation the tap is applied to a barrel or cask with the plug C closed, and the cover
 10 F is turned with its cork x against the front of the cylinder until the tap is to be opened, when the cover is turned away from the cylinder, exposing it to the entrance of the key. Then the key D is employed and a suitable
 15 provision is made for conveying the discharge from the cask to any desired point. The key may be applied to open the tap at any time and may be removed therefrom at any time, the operation of removing it always closing
 20 the tap. During these operations the washer G will prevent any leakage.

It will be seen that my invention provides improvements in taps and like valves which can be readily availed of and which reduce
 25 the cost and improve the operation of such devices; and it will be understood that the invention is not limited to the particular details of construction and arrangement set forth as constituting its preferred form, since
 30 these may be modified as circumstances or the judgment of those skilled in the art may

dictate without departing from the spirit of the invention.

What I claim is—

A tap consisting of a hollow cylinder, an
 35 annular recess located in the interior of said cylinder, the bore of said cylinder excepting said recess being uniform throughout, a thread located in said cylinder on each side
 40 of the said recess, a washer located in said recess, the inner periphery of the washer extending beyond the surface of the bore of the cylinder, a plug located in the inner end of
 45 said cylinder, a key located in the outer end of the cylinder, said key having a cylindrical section adapted to slide longitudinally within
 50 said washer, in so doing said cylindrical section coming in close contact with the said washer along its entire length, said key having a thread just forward of the said cylindrical section, said thread adapted to engage
 55 the thread in the outer part of the cylinder, the inner end of said key adapted to operate the plug and thus open and close the tap, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM H. FOSS.

Witnesses:

GEORGE H. FRASER,
 THOMAS F. WALLACE.