

F. G. GARRARD.
VENT FOR WELL TUBES.
APPLICATION FILED MAY 29, 1912.

1,041,770.

Patented Oct. 22, 1912.

Fig. 1.

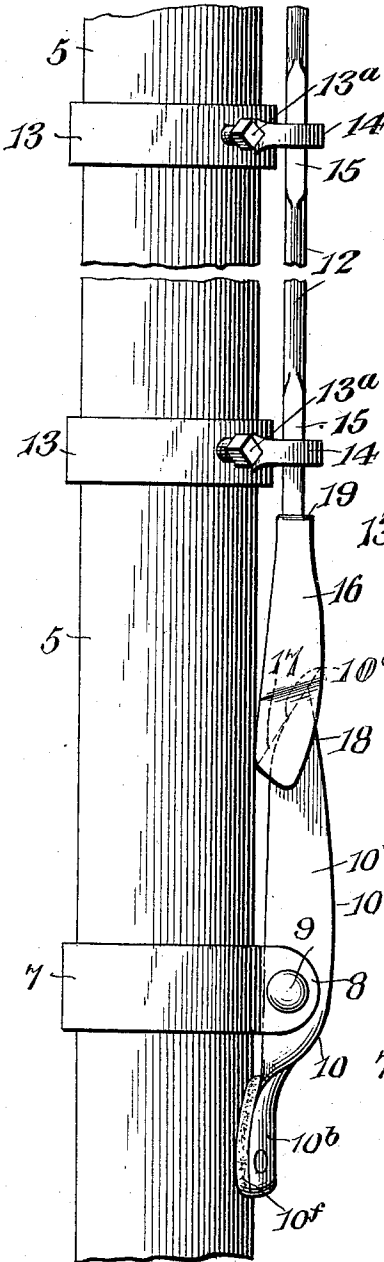


Fig. 2.

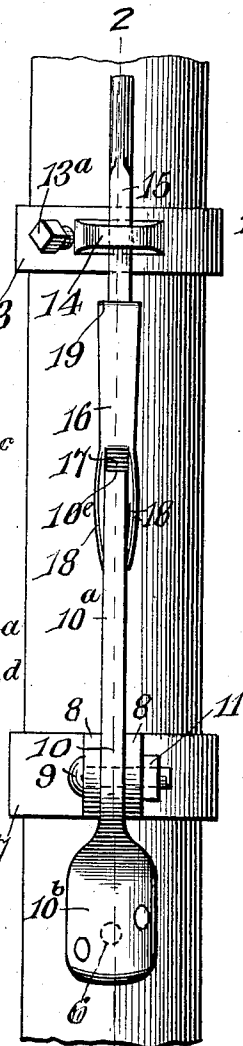
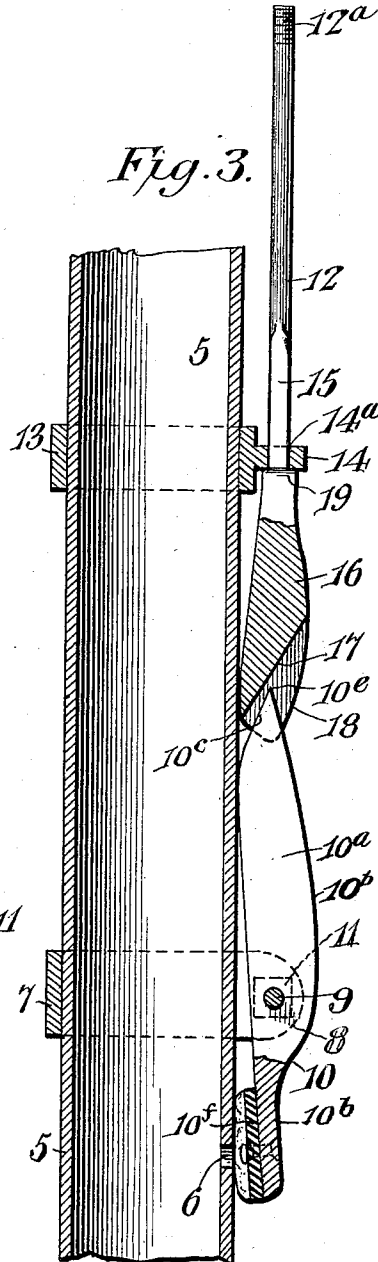


Fig. 3.



WITNESSES

Jas. K. McLaughlin
Stewart Rice.

2 Fred G. Garrard INVENTOR

BY

E. G. Siggers

ATTORNEY

UNITED STATES PATENT OFFICE.

FRED G. GARRARD, OF BANNER COUNTY, NEBRASKA, ASSIGNOR OF ONE-HALF TO
WESLEY ALEXANDER, OF BANNER COUNTY, NEBRASKA.

VENT FOR WELL-TUBES.

1,041,770.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed May 29, 1912. Serial No. 700,538.

To all whom it may concern:

Be it known that I, FRED G. GARRARD, a citizen of the United States, residing in the county of Banner and State of Nebraska, have invented a new and useful Vent for Well-Tubes, of which the following is a specification.

My invention relates to improvements in devices for opening and closing the drain vents of pump tubes, and has for its primary object to provide such a device, which can be mounted on a tube in a well having a small bore. With this especial object in view all the parts are mounted close to the well tube and the operating parts are so constructed and arranged that in being moved to open or close the drain vent there is little relative movement of the parts while the results are accomplished effectively and positively. Further in closing the drain vent I utilize the weight of the plunger rod, which insures the holding of the vent securely closed without a possibility of its accidentally opening and avoiding the use of separate locking means.

It consists in certain features of construction, and a certain combination and arrangement of parts hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings; Figure 1 is a side elevation of alined sections of a pump tube with my drain vent closing device mounted thereon. Fig. 2 is a front elevation of the lower or directly opposite section of Fig. 1. Fig. 3 is a longitudinal sectional view taken on the line 2—2, Fig. 2.

Referring to the drawings, which illustrate the preferred embodiment of my invention, 5 designates short detached sections of a well tube, which may be several hundred feet in length more or less according to requirements. The tube is provided with a drain vent or opening 6, which is located at the desired distance below the surface of the ground.

Secured just above the opening 6 is a clamping collar 7, the ends 8 of which are separated and extend outwardly parallel to each other. The opening 6 is preferably centrally in alinement with the space between the ends 8, and fulcrumed on a bolt 9, which passes through centrally-disposed, alined holes in the ends 8, is a lever 10 disposed longitudinally of the well tube. The bolt 9 is fitted with a nut 11 by which the

clamping collar 7 can be adjusted on the well tube and the freedom of movement of the lever also regulated. The lever 10 for the greater portion of its length comprises a relatively narrow, flat bar portion 10^a, and has its lower end spread out at right angles and curved to conform to the curvature of the tube to form a closure 10^b in operative relation to the opening 6. The lever is pivoted edgewise between the ends 8 of the clamping collar 7 and close to the closure 10^b so that it is pivoted nearer its lower end than its upper end to provide great leverage and a heavier upper end. As best seen in Fig. 3, the lever is substantially straight on its inner or edge contiguous the well tube throughout its length except at its extreme upper end where it is inclined outwardly and upwardly or undercut to form an inclined cam face 10^c, while its outer edge 10^d is curved from the inner end of the closure 10^b over on a long low or bow curve which terminates at the upper end of the lever at the cam face 10^c to form a narrow, relatively sharp edge 10^e. Riveted to the inner face of the closure 10^b is a washer or cushion 10^f which closely engages the drain opening 6 when pressed against it. As will be noted from the drawings the lever is pivoted close to the well tube, but owing to its straight lower edge when the longitudinal axis of the lever is parallel with the longitudinal axis of the well tube the lever is spaced from the tube at all points.

Mounted longitudinally of the well tube and in alinement with the lever is a plunger rod 12, which is supported and guided at intervals throughout its length by collars 13 fixedly secured to the well tube by set screws 13^a. The collars are each provided with lugs 14 provided with square apertures 14^a through which passes the plunger rod. The plunger rod is squared, as at 15, for a portion of its length at each point where it passes through the square perforations 14^a in the lugs which prevent the rod from turning.

At its lower end the plunger rod 12 is provided with a head 16, the lower portion of the inner side of which projects inwardly and bears against the side of the well tube 5. The plunger head is provided with an inclined cam face 17, which extends downwardly and inwardly toward the well tube from its outer side to its lower and at each

side is provided with oppositely-disposed outstanding walls 18, which form abutments arranged at the sides of the cam face. The abutments as shown project slightly in front of the end of the head and extend back to the upper end of the inclined face. The upper end of the plunger head is shouldered at 19 and squared as at 15 for a short distance above the shoulder to work in a square aperture 14^a in the lug 14 of one of the collars 13.

As illustrated in Fig. 3 of the drawings, the lug 14 carried by the collar 13 just above the plunger head 16 is so positioned with respect to the shoulder 19 on the plunger head that the plunger head cannot be drawn up far enough to displace the upper end of the lever from the abutments 18, which serve as a keeper for the upper cam end of the lever and prevent its lateral displacement. As will be noted from Fig. 3 of the drawings the cam face 17 of the plunger head is normally disposed at a sharp incline or acute angle to the cam face 10^e of the lever so that when said plunger rod 12 is lowered the sharp edge 10^e of the lever will contact with the cam face 17 of the plunger head and ride up the same until the face of the cam of the lever coincides with the face of the cam of the plunger head when said closure 10^b will be pressed inwardly tightly over said drain opening 6 and will close the same until the plunger rod 12 is lifted at the top of the well and supported in its raised position in any suitable manner not shown.

From the foregoing it will be apparent that I have produced a simple and effective device for opening and closing the drain opening 6 in a well tube. The drain opening can be located at any depth according to the freezing point with the assurance that the device will operate perfectly. When the plunger rod 12 is raised the weight of the water in the well tube will force the closure 10^b of the lever away thus uncovering the drain opening. The closure is further sure to open by reason of the fact that the washer 10^f will expand slightly when it is relieved from compression, and also the thickness of the washer inclines the upper or heavier end of the lever toward the well tube so that it naturally falls toward the tube.

A pump tube provided with a device, for closing and opening the drain vent, constructed in accordance with my invention will be found very easy to position in or remove from a well with a small bore by reason of the fact that all parts are located close to the well tube and there are no projecting parts. The lever 10 is so constructed that its movable ends are brought closer to the tube than its central portion so that when either end is moved outwardly there

is no outstanding projection. When the closure 10^b is moved away from the well tube, the end 10^e of the lever is at a point about opposite the center of the cam face 17 of the plunger head 16 and when the cam face 10^e of the lever is engaged with the cam face of the plunger head, as shown in Fig. 1, the end 10^e of the lever does not project beyond the plunger head. When a well tube provided with my drain opening and closing means is lowered into or removed from a well, it will be found that the construction illustrated and described will permit of its easy accomplishment, as it is impossible for any part of the device to be caught in the casing or side of the well.

While I have shown and described the lugs 14 of the collars 13 as provided with square holes 14^a, and the plunger rod 12 as provided with corresponding squared portions 15, it is to be understood that any other suitable arrangement could be adopted to prevent the rod from turning. If desired, the holes 14^a in the lugs 14 could be round and the plunger rod formed cylindrical throughout its length, as the abutments 18 would serve as a keeper to prevent the plunger rod from turning. The plunger rod will in most instances be made up of sections, the ends of which are threaded, as at 12^a, so that they can be connected together by a suitable coupling, not shown.

The special object of my invention is to prevent freezing and consequent bursting of the well tube for, as has been previously stated, the drain opening is located below the freezing point thus insuring that that part of the well tube above the drain vent will be free of water when the plunger rod is lifted to permit the closure 10^b of the lever 10 to be forced away from the drain opening 6 as has been previously explained.

What is claimed is:—

1. In a device of the character described, a vertically disposed well tube provided with a drain opening, a lever extending longitudinally of and fulcrumed close to said well tube and having a closure for said drain opening at the lower end of said lever, an outwardly and upwardly extending cam face provided at the upper end of said lever and forming an undercut portion, a plunger rod movably mounted on said well tube above said lever, a plunger head carried at the bottom of said plunger rod and having a sliding bearing against said well tube, and a cam face formed on the outer side of said plunger head and extending to the lower end of the same and normally extending behind and out of engagement with the cam face of said lever and at an angle thereto, whereby when said plunger rod is lowered, the cam face of said lever will contact with the cam face of said plunger head and said lever will be forced outwardly until said clo-

sure is pressed tightly against said drain opening to close the same.

2. In a device of the character described, a vertically disposed well tube provided with a drain opening, a lever extending longitudinally of and fulcrumed close to said well tube and having a closure for said drain opening at the lower end of said lever, an outwardly and upwardly inclined cam face provided at the upper end of said lever, a gravity plunger rod movably mounted on said well tube above said lever, a guide for said plunger rod to permit vertical movement of said plunger rod and holding the same against rotation, a plunger head provided at the lower end of said plunger rod and having a slidable bearing on said well tube, an inclined cam face formed on said plunger head and normally extending behind and out of contact with the cam face of said lever and at an acute angle thereto, whereby when said plunger rod is lowered the upper end of said lever will contact

with the cam face of said plunger head and said lever will be forced outwardly until said closure is pressed tightly against said drain opening to close the same, abutments formed at each side of the cam face of said plunger head to prevent the lateral displacement of the cam of said lever with respect to the cam of said plunger head, and an abutment carried by said plunger head and adapted to engage the guide for said plunger rod to prevent said plunger head being drawn sufficiently far away to disengage the cam end of said lever from the abutments at each side of the cam face of said plunger head.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRED G. GARRARD.

Witnesses:

GEO. L. VOGLER,
HENRY VOGLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."