H. G. JOHNSON.

Check-Valve.

No. 167,255. Patented Aug. 31, 1875.

Fig 1

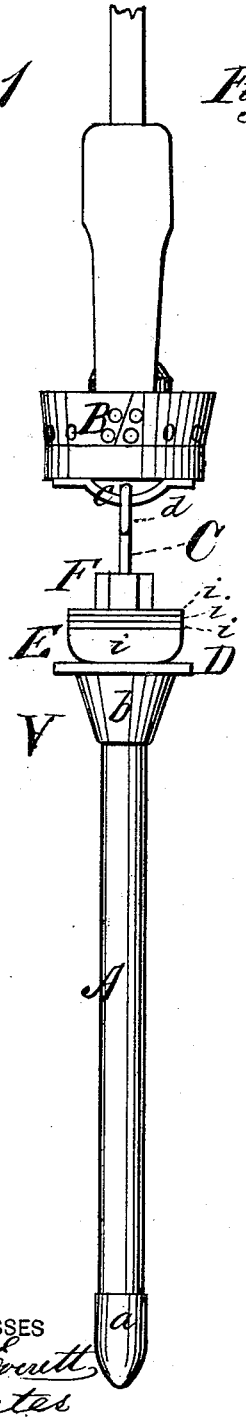
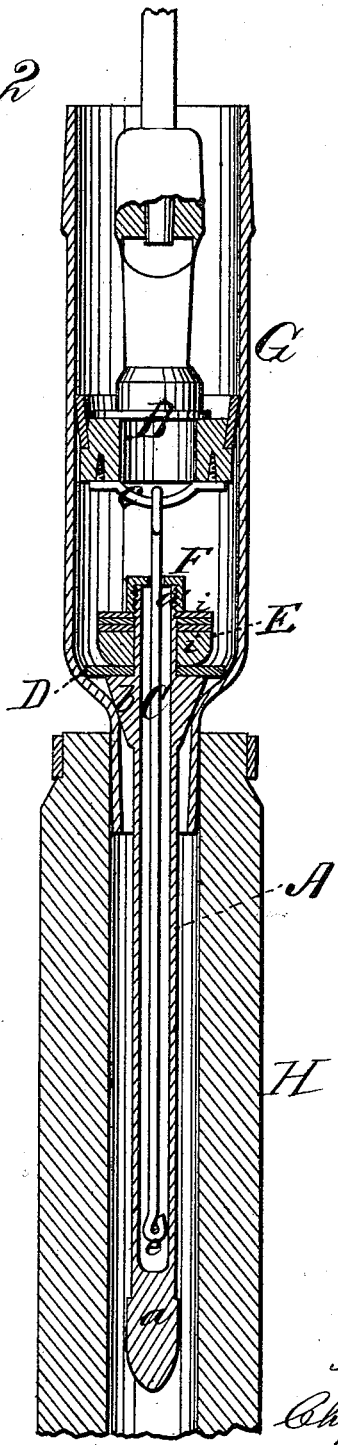


Fig 2



WITNESSES

Robert Everett

E. H. Bates

INVENTOR

Heber G. Johnson

Chipman & Fraser

ATTORNEYS

UNITED STATES PATENT OFFICE.

HEBER G. JOHNSON, OF GREENCASTLE, INDIANA.

IMPROVEMENT IN CHECK-VALVES.

Specification forming part of Letters Patent No. **167,255**, dated August 31, 1875; application filed July 3, 1875.

To all whom it may concern:

Be it known that I, HEBER G. JOHNSON, of Greencastle, in the county of Putnam and State of Indiana, have invented a new and valuable Improvement in Check-Valves; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a plan view of my device, and Fig. 2 is a longitudinal central sectional view of the same.

This invention has relation to improvements in induction or check valves for lifting-pumps; and the nature of the invention consists in a metallic guiding-rod loosely connected with the plunger, and adapted to be received into the tubular stem of the induction-valve, whence it is prevented from escaping by means of a knob upon its end, and a nut applied upon the upper end of the tubular stem, whereby the induction or check valve is guided in its ascent and descent when the plunger is operated, and a means is provided whereby the two valves may be withdrawn from the pump-stock by drawing up upon the piston rod.

In the annexed drawings, A designates a tubular metallic valve-stem of suitable length, the lower end of which is provided with a closing-plug, *a*, and its upper end with a male screw-thread, *a'*. It has also a collar, *b*, near its upper extremity, which is of the shape of an inverted right cone, and is so placed in relation to the stem that the axial line of the one coincides with that of the other. In practice, stem A, with its plug and collar, will be cast in one piece; but the two latter may be made separately and screwed or otherwise suitably secured upon the stem, if I so elect. B represents the plunger, which differs in no essential respects from those in general use, and is provided upon its lower end with a bail or loop, *c*, from which is suspended, by means of an eye, *d*, a rigid metallic rod, C. This rod is designed to be inserted into the bore of stem A, and it is provided with an enlargement, *e*, upon its lower end, for a purpose hereinafter explained. D indicates a packing-ring of leather or other suitable material, which is passed over the upper end of stem A, and rests upon the shoulder or shelf formed by the upper plane surface of collar *b*. Upon this packing-ring and over stem A a weighting-cap, E, is placed, which consists of a number of sectional flat rings, *i*, the lower one of which is considerably heavier than the remainder, and which is designed to force the valve down upon its seat with great rapidity when the upward movement of the plunger B ceases, thus preventing the escape of water down into the well or cistern. This cap is held in position upon the valve-stem by means of a screw-cap, F, which is applied upon the upper screw-threaded end of the said stem. Connecting and guiding rod C passes through a central perforation in this cap, and is held to its engagement with the stem by means of the enlargement *e* on its lower end, which, being considerably larger than the perforation in the cap, will prevent its being drawn through the same. The entire check or induction valve, which I designate by the letter V, is designed to be lowered along with plunger B into the pump-cylinder G, the lower end of which is contracted to form a seat, upon which the conical collar *b* of the stem rests, as shown in Fig. 2.

As the pump-cylinder will form the subject-matter of another application for Letters Patent, it is not deemed necessary to further explain its peculiarities of shape and construction herein.

When the valve is on its seat stem A will project downward into the exhaust-tube H of the pump, and will by its gravity, acting on the principle of a pendulum or plummet, hold the said valve snugly seated; and during the reciprocations of the plunger, which, owing to the fact that rod C has free movement within the stem, will in no manner be obstructed by the check-valve V, the upward rush of the water will raise the latter vertically upward, rod C serving as a guide to this end, since the conical collar on the valve-stem will give the water sufficient hold for the purpose; but the moment plunger B ceases its upward movement the check-valve will drop suddenly back upon its seat, and will cut off the escape of the water, through tube H, back into the well. When, from any cause, the pump becomes inoperative, the plunger and check-valve may

be raised bodily out of the pump-stock, through the medium of connecting-rod C, uniting the two, and any defect remedied without raising and dismounting the pump-stock.

In practice, the weight of cap E varies with the diameter of the pump-cylinder; but in all the sizes of my improved valve it is regulated, where four disks are used, on the basis that the distance between the valve-seat and the water is thirteen feet; but where this interval is greater than thirteen feet one of disks *i* is removed for every additional four feet.

By this means, as the water in a well or cistern lowers, the check-valve may be restored to its full and most operative condition with but little trouble, thus greatly lessening the labor of pumping.

Valve-stem A may be of wrought or of cast iron, as I may elect, and under some circumstances it will be galvanized or otherwise suitably protected against oxidation.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a metal induction or check valve for wood or metallic pumps, the tubular valve-stem A, having inverted conical collar *b* and plug *a*, substantially as specified.

2. The induction or check valve *v*, having collar *b*, packing-ring D, and tubular stem A, in combination with sectional and adjustable weight E, screw-cap F, connecting and guiding rod C, and plunger B, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

HEBER G. JOHNSON.

Witnesses:
GEO. J. LANGSDALE,
SILAS A. HAYS.