(No Model.)

J. B. WEST.

AIR COMPRESSING APPARATUS.

No. 259,348. Patented June 13, 1882.

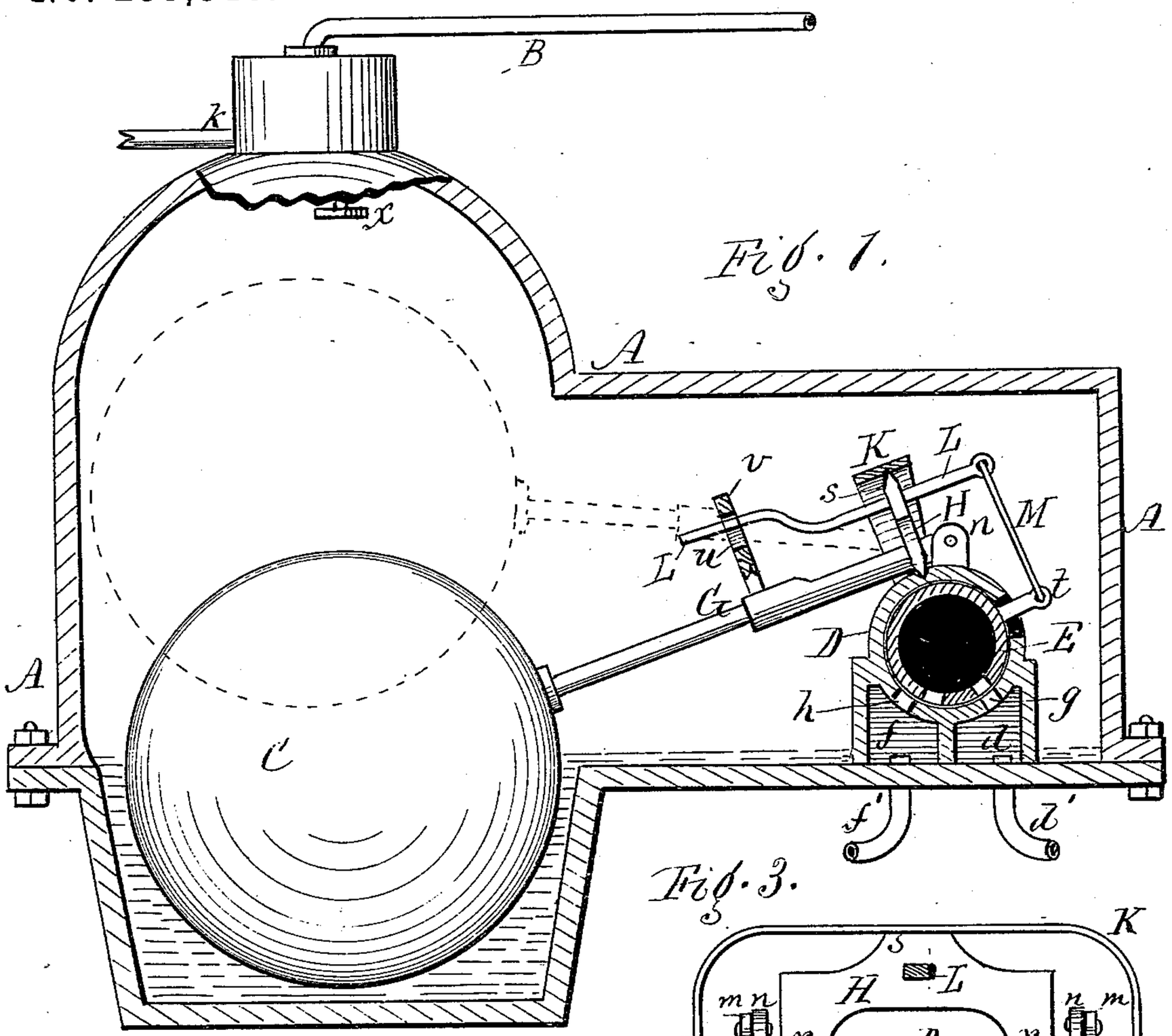


Fig. 1.

Fig. 3.

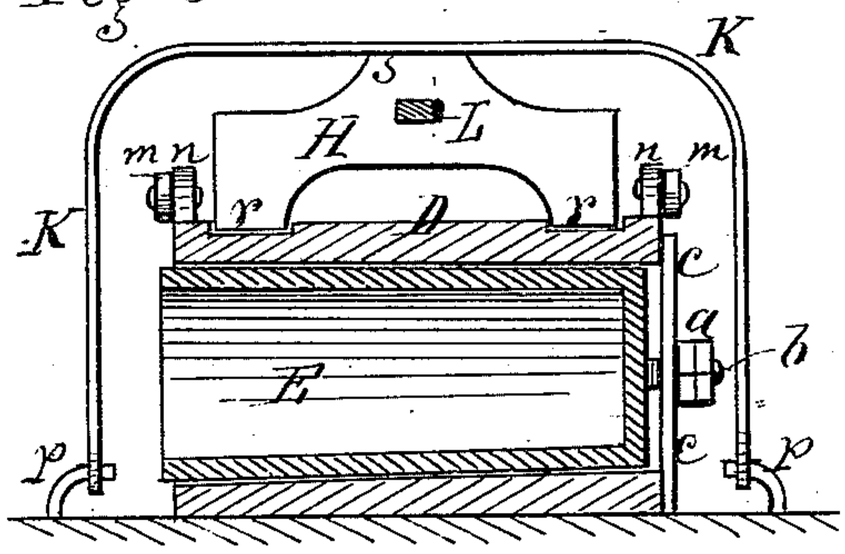


Fig. 2.

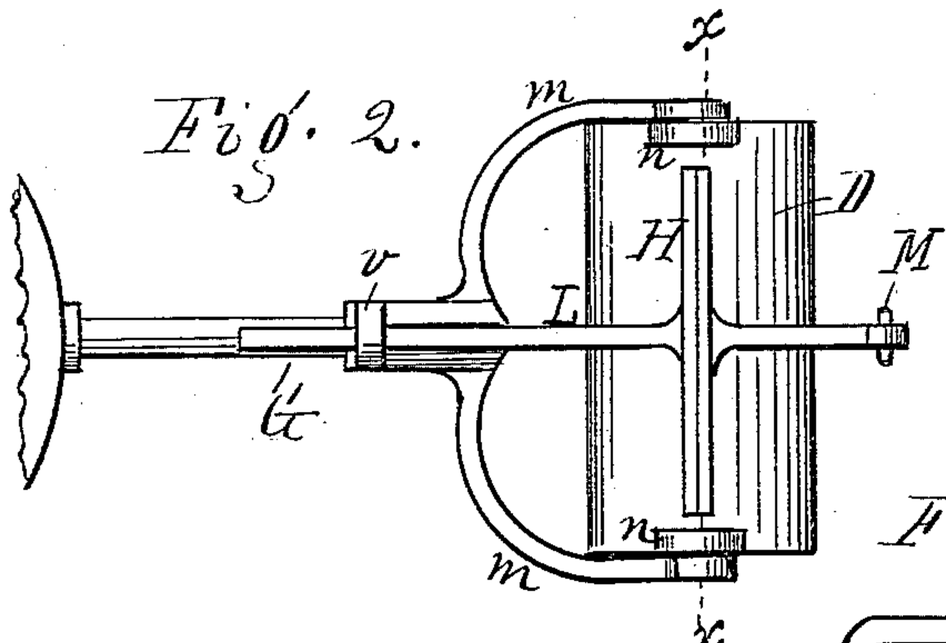
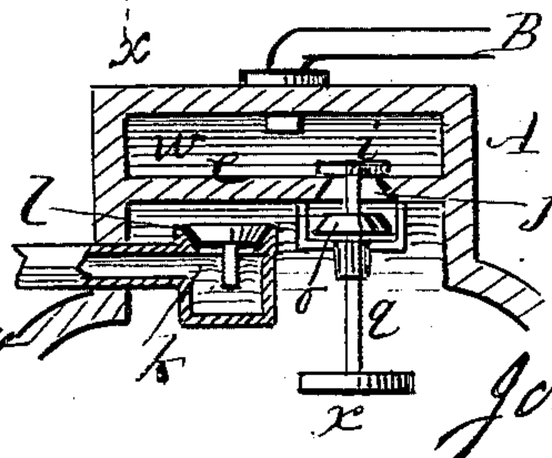


Fig. 4.



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AIR-COMPRESSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 259,348, dated June 13, 1882.

Application filed October 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN B. WEST, of Rochester, Monroe county, New York, have invented a certain new and useful Improvement in Air-Compressing Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the apparatus. Fig. 2 is a plan of the operating parts removed from the case. Fig. 3 is a longitudinal section of the cylinder and valve in line *x x* of Fig. 2. Fig. 4 is a vertical section of the top of the dome.

My improvement relates to reciprocating or intermittent mechanism operated upon by a pressure of water to force air through a discharge-pipe, and is applicable to many and various uses, one of which is to force air into beer-barrels and other liquid-receptacles for the purpose of elevating the liquids or to supply the vacuum as they are drawn off.

The invention consists in the construction and arrangement hereinafter more fully described.

A represents a metallic case, practically air-tight.

B is a discharge air-pipe at the top of the case, extending to the point at which the compressed air is to be utilized.

C is a float of suitable form, which alternately rises and falls in the chamber as the water is entered and discharged, said float being connected with a shifting mechanism for controlling the flow, as will presently be described.

D is a cylinder located within the case, and open at both ends.

E is a barrel forming a valve, which rests and turns within the cylinder. This valve is open at one end and closed at the other, as shown in the longitudinal section, Fig. 3. The valve and the seat in the cylinder in which it rests are made slightly conical or tapering toward the closed end, so that as the valve wears in rocking forward and back it can be tightened in its seat by simply drawing it endwise. This is done by means of a nut or nuts, *a*, on a screw-stem, *b*, the nut resting against a bar or fulcrum, *c*. Beneath the cylinder is an induction-chamber, *d*, and eduction-chamber *f*, with which connect corresponding pipes, *d' f'*, and through the cylinder and valve are ports *g* and *h*, so arranged, as shown, that when the ports on one side are in coincidence those on the other side are separated or cut off. By this means, as the valve is rocked, it admits the induction-water on one side, which flows through the ports into the valve and through the open end of the valve into the chamber, and when rocked the other way it cuts off the flow, and the water in the chamber escapes back through the open end of the valve, and through the eduction-ports into the eduction-chamber. As the water thus alternately rises and falls, the air will be correspondingly forced out through the pipe B into the discharge, and new air will be admitted into the chamber through an air-opening, *k*, in the dome, which air-opening is covered by a valve, *l*, which opens to allow the air to pass in, but closes to prevent it from being driven out again.

G is an arm having two branches, *m m*, which are pivoted to lugs *n n* at the ends of the cylinder D, the opposite or outer end of the arm being attached to the float C. The float thus swings from the lugs as a center.

H is a rocker or fulcrum plate, having two sharp edges, *r r*, at its bottom, which rest in notches in the top of the cylinder, and a single sharp edge, *s*, at its top, which rests in a notch on the under side of a bow-shaped spring, K, which extends up over the parts, the lower ends of the spring being attached to pivots *p p*, as shown in Fig. 3. To the rocker is attached a stiff lever, L, which extends both in front and rear. To the rear end is attached a link, M, which connects at its opposite end with an arm, *t*, of the valve, that extends out through a slot of the cylinder. The front end of the lever turns up and rests in a slot, *u*, of a short standard, *v*, that projects up from the top of the arm G.

The operation is as follows: The spring K, being pivoted at its bottom, can swing either way past the dead-center. In doing so the rocker H strains it as it passes the vertical point, and causes the spring to produce stress to carry the rocker over. As the water fills the chamber, the float is raised, which raises the rocker. As soon as the rocker passes the

dead-center the spring carries it over and shifts the valve by means of the connections L M *t*, thereby allowing the water to drain from the chamber. As it passes out the float falls again and shifts the valve to its former position, admitting the water once more. The action is thus automatic and intermittent, and the resistance of the air under pressure is the regulator of the flow.

In the top of the dome is a chamber, *w*, shut off from the chamber A by a diaphragm, *e*. In this diaphragm is made a port, *j*, over which rests a valve, *i*, and under which rests a valve, *o*, attached to a stem, *q*, extending down some distance, and provided with a small float, *x*. The valve *i* allows passage of the air upward, but prevents its escape back again. In case of accident to the mechanism when the water is turned on, whereby the case would fill with water, the small float *x*, rising with the water, will cause the valve *o* to rise and close the port, thereby preventing the water from flowing upward into the discharge air-pipe and passing into the exit.

The shifting mechanism before described is such that the valve has a positive spring action in both directions, which renders it sure in action both ways, and obviates the objection to those devices where the valve is so arranged that it has but little power in shifting.

Having thus described my invention, I claim—

1. In an intermittent air-compressing apparatus, the combination of the float C, the arm G, the cylinder D, and valve E, provided with the ports *g h*, and the shifting mechanism consisting of the rocker H, lever L, spring K, link M, and arm *t*, as herein shown and described.

2. The combination of the swinging arm G, provided with the slotted standard *v*, the rocker H, the lever L, resting in the slot of standard *v*, the spring K, and the link M, connecting the lever with the arm *t* of valve E, as herein shown and described.

3. The combination, with the chamber *w* in the dome, having an air-inlet below and an air-exit above the chamber, of valve-stem *q*, provided with a float, *x*, at its lower end, and the two valves *i o*, one above and the other below the port *j* of the diaphragm *e*, as shown and described, and for the purpose specified.

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

JONATHAN B. WEST.

Witnesses:
R. F. OSGOOD,
J. H. HOPKINS.