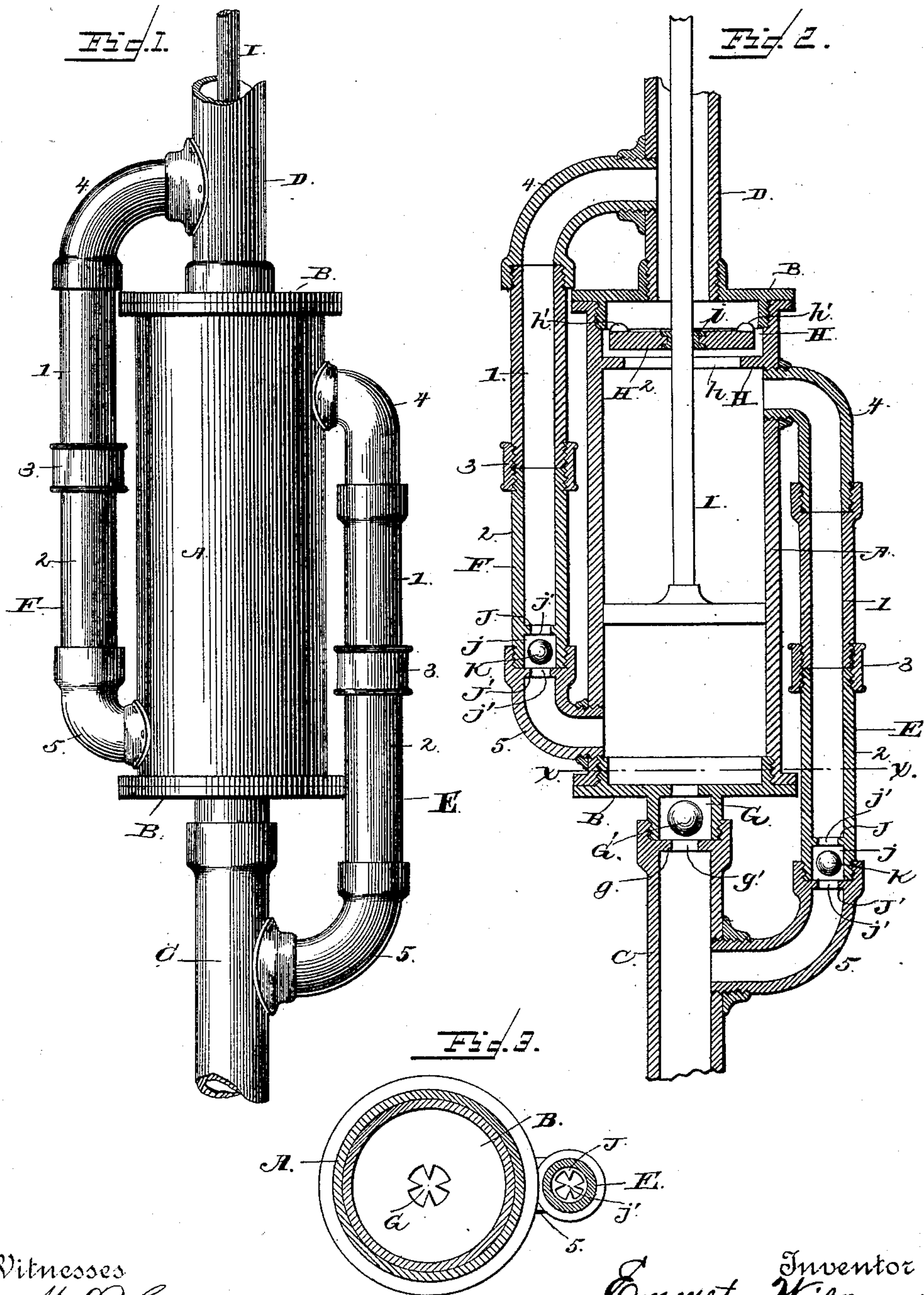


(No Model.)

E. WILCOXON.
DOUBLE ACTING PUMP.

No. 358,909.

Patented Mar. 8, 1887.



Witnesses
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UNITED STATES PATENT OFFICE.

EMMET WILCOXON, OF WHITE CHURCH, KANSAS.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 358,909, dated March 8, 1887.

Application filed September 27, 1886. Serial No. 214,651. (No model.)

To all whom it may concern:

Be it known that I, EMMET WILCOXON, a citizen of the United States, residing at White Church, in the county of Wyandotte and State of Kansas, have invented new and useful Improvements in Double-Acting Pumps, of which the following is a specification.

My invention relates to improvements in double-acting pumps; and it consists of the peculiar combination and novel construction and arrangement of the various parts for service, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

The object of my invention is to provide an improved pump which shall force or throw the water in a continuous stream at each stroke of the piston or plunger, and to provide a pump of this class which shall possess superior advantages in points of simplicity, durability, and strength of construction, effectiveness of operation, and cheapness of manufacture.

In the accompanying drawings, which illustrate a double-acting pump embodying my improvements, Figure 1 is a side elevation, and Fig. 2 is a vertical central longitudinal sectional view, thereof; Fig. 3, a sectional view on line *x x* of Fig. 2.

Referring to the drawings, in which like letters and figures of reference denote corresponding parts in all the figures, A designates the cylinder of my improved pump, which is provided at its ends with the removable heads B, which are secured in place by the usual or any preferred means.

C designates the main supply-pipe, which opens through the lower head of the cylinder, and D the vertical discharge-pipe, which also opens through the upper head of the cylinder, as shown.

E designates the supplemental supply-pipe to the cylinder, which opens at its lower end into the main supply-pipe C and at its upper end into the upper end of the cylinder.

F is the supplemental discharge-pipe, which communicates at its lower end with the lower extremity of the cylinder and at its upper end with the lower end of the main discharge-pipe D, so that the water from the cylinder is discharged in a continuous stream through a single pipe only—the main pipe D—as will be more fully hereinafter described.

G designates a valve-chamber, which is made in the form of a tube and secured to the center of the lower head, B, of the cylinder, and this valve-chamber has a horizontal partition, *g*, through which is formed an inlet-opening, *g'*, that opens into the supply-pipe C, to permit the water to pass therethrough from the pipe into the lower end of the cylinder. A ball-valve, *G'*, is located in this valve-chamber, and it alternately rests upon and is elevated from contact with the partition *g*, which forms the seat therefor, so that the water is admitted to the lower end of the cylinder during the up-stroke of the piston therein and is excluded from the cylinder during the downstroke of the piston, the valve being forced to its seat by the pressure of the water thereon during the downstroke of the piston or plunger.

H designates a transverse horizontal partition which is provided near the upper end of the cylinder. This partition is formed integral with the cylinder, or is fixed rigidly in place therein, and it forms or provides a chamber, *H'*, beneath the upper head of the cylinder, in which a valve, *H²*, operates. The partition is provided with a central opening, *h*, for the escape of the water from the cylinder into the valve-chamber *H'*, and the valve *H²*, which operates in the said chamber, is provided on its upperside with projecting nibs or flanges *h'*, which are adapted to come in contact with the lower side of the upper head of the cylinder, and thereby prevent the further vertical movement of the valve, these nibs or flanges serving; further, to provide or form a space between the valve and the upper head of the cylinder, so that the ascending column of water from the cylinder which passes through the valve-chamber can escape through the said spaces and into the discharge-pipe D when the valve is elevated.

I designates the piston which operates in the cylinder, which may be of the ordinary or any preferred form. The piston-rod extends through the central opening in the partition H and the upper cylinder-head, and also through a packing-ring, *i*, which is secured centrally in the valve *H²*, so that the valve will move or reciprocate within the chamber when the piston is operated.

The supplemental supply and discharge pipes E and F are made in two sections, 1 and

2, which are provided at their ends with exterior screw-threads and connected by an interiorly-threaded coupling-sleeve, 3. The upper ends of the upper sections, 1, of the said pipes are connected with the cylinder and main pipe by an intermediate bend, 4, and they are likewise connected at their lower ends with the cylinder and pipe by similar bends, 5, as more clearly shown in the sectional view, Fig. 2, of the drawings.

The lower end of the lower section, 2, of each of the supplemental pipes is provided with a horizontal partition, J, and a horizontal partition, J', is provided in the bend 5, between which a valve-chamber, j, is formed or provided, and these partitions are provided with transverse aligned openings j', which form the escape and supply ports for the valve-chambers. A ball-valve, K, is located between the partitions of the said valve-chambers, which are alternately operated as the plunger makes its down and up strokes.

This being the construction of my invention, the operation thereof is as follows: On the upstroke of the piston the water above the piston is forced through the upper valve-chamber, H', and thereby creates a vacuum beneath the piston, which is supplied with water from the main supply-pipe C. The valve H² is elevated with the piston until its ribs or flanges strike the upper cylinder-head, where the valve stops and forms the space, hereinbefore described, for the escape of water from the valve-chamber H', as will be very readily understood. The valve K in the supplemental supply-pipe E is also closed, as well as the valve in the discharge-pipe F. On the downstroke of the piston the valve H' is forced to its seat, as well as the valve G', to prevent the admission of water to the cylinder through the lower end thereof, as described, the water beneath the piston being forced out through the supplemental discharge-pipe F, and the pressure thereof elevates the valve therein from its seat to permit of the passage of the water. The pressure of water beneath the piston on its downstroke forces the lower valve, G', to its seat, and the upper valve, H², is also forced on its seat, so as to form a vacuum above the piston in the upper part of the cylinder. A suction is thus created in the upper part of the cylinder which draws or elevates the water in the supplemental supply-pipe E, and the pressure of water elevates the valve therein off its seat, so that the upper part of the cylinder is supplied with water simultaneously with the downstroke of the piston. It will thus be seen that the opposite ends of the cylinder are alternately filled or supplied with water automatically, and that the water is forced therefrom on the up and down strokes of the piston, thereby ejecting the water in a steady continuous stream from the main discharge-pipe.

Slight changes may be made in the form and proportion of parts and details of construc-

tion without departing from the spirit of my invention.

The cylinder and the several parts connected therewith may be arranged in a horizontal or inclined position, as well as a vertical one, without interfering with the operation, the invention being capable of operation in either position.

It will be observed that in each case where the ball-valve is employed one of the sections of pipe carries the seat for the valve and the other section the chamber for the ball, thus enabling free access to the parts in inserting and withdrawing the ball.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a double acting pump, the combination of a cylinder, A, having a valve-chamber, G, opening into its lower end, and the transverse partition H at its upper end, forming a valve-chamber, H', a main supply-pipe, C, communicating with the lower end of the cylinder through the valve-chamber G, a main discharge-pipe, D, communicating with the upper end of the cylinder through the valve-chamber H' therein, a piston working in the cylinder and having its rod passing through the valve-chamber H' and the main discharge-pipe D, a ball-valve located in the lower valve-chamber, G, a flat valve, H², located in the upper valve-chamber and fitted on the piston to move or reciprocate therewith and having the upwardly-projecting ribs h', which are adapted to come in contact with the upper head of the cylinder on the upstroke of the piston, and thereby limit the upward movement of the said valve, the supplemental supply-pipe E on one side of the cylinder and opening at its opposite ends into the upper end of the cylinder and the main supply-pipe, and the supplemental discharge-pipe on the opposite side of the cylinder and opening into the lower end of the latter and the main discharge-pipe, all arranged and combined substantially as described, for the purpose set forth.

2. The herein described and shown double-acting pump, comprising the cylinder having a perforated partition rigidly secured within the cylinder, near its upper end, a valve, H², working between said partition and the upper cylinder-head and provided with the upwardly-projecting lugs, the discharge-pipe connected to the upper cylinder-head, the piston working in the cylinder between the lower cylinder-head and the partition in the upper end of said cylinder, and having its rod passed through said partition and also through the valve H², the upper cylinder-head, and the discharge-pipe, substantially as set forth.

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

Witnesses: EMMET WILCOXON.
LAFAYETTE CAMPBELL,
OLIVER N. AXTELL.