

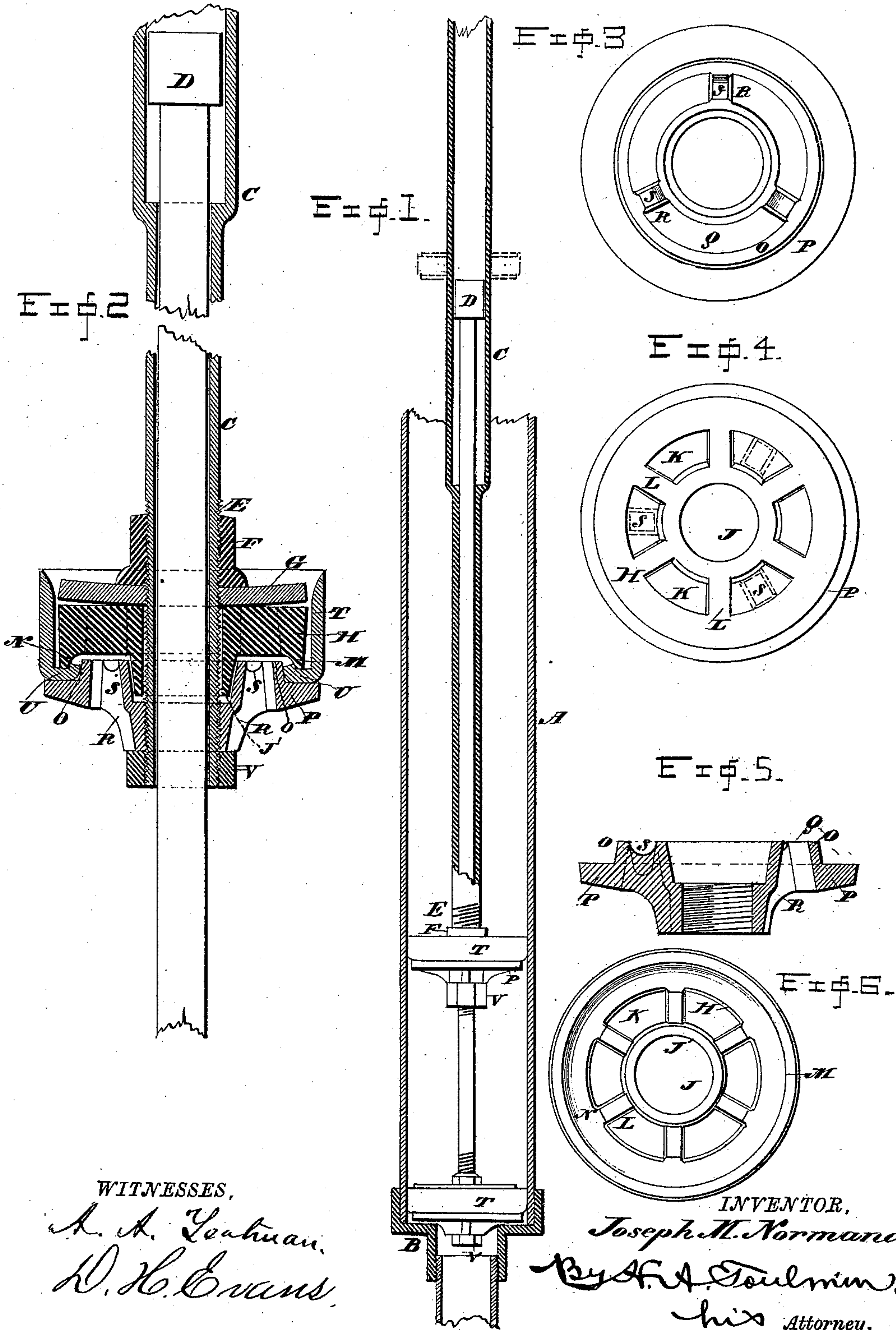
(No Model.)

J. M. NORMAND.

COMBINED PUMP PISTON AND CHECK VALVE.

No. 378,848.

Patented Feb. 28, 1888.



UNITED STATES PATENT OFFICE.

JOSEPH M. NORMAND, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO
JACOB K. MOWER, OF SAME PLACE.

COMBINED PUMP-PISTON AND CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 378,848, dated February 28, 1888.

Application filed June 23, 1887. Serial No. 242,214. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. NORMAND, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in a Combined Pump-Piston and Check-Valve, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in a combined pump-piston and check-valve; and the improvements consist, first, of a piston-rod proper whose lower end is hollow or of tubular form and constructed with an interior shoulder, and supplied at its lower end with a piston head and plunger, and of a check-valve adapted to fit snugly in its seat, as in the lower end of the pump-cylinder, so as to maintain its position by frictional contact with the seat, and having a stem which extends upward and within the hollow rod a sufficient distance, and which fits sufficiently loose to allow said rod to move freely up and down while pumping, and provided with an enlargement which engages the interior shoulder, whereby the check-valve may be lifted out of the pump for repairs or renewal by simply withdrawing the piston with sufficient force to overcome the frictional contact between the valve and its seat.

The invention further consists in constructing the piston or plunger and valve (for both are preferably of the same form) with a metallic skeleton annular frame having an eye which fits over the rod or stem, a hub depending from the lower face around said eye, and an annular head depending from said face near the outer edge thereof, and with an associate seat having a screw-threaded eye which screws upon the rod or stem, and the upper part of which eye is enlarged to receive the said hub, and also having an annular upwardly-projecting bead, which extends somewhat into the receding face and is within the bead on the frame, the hub and eye in which it fits keeping the frame and seat concentric one with the other and without regard to the fit of the frame on the rod or stem, the hole therein for the rod or stem being cast large enough to allow the frame to be easily slipped thereon without being bored or finished, and hence too large to

keep the frame from slipping from side to side and loosening the grip upon the packing, and the beads holding the packing and turning its inner edge somewhat upward and into the said receding face.

In the accompanying drawings, forming a part of this specification, and on which like reference letters indicate corresponding parts, Figure 1 represents a vertical sectional view of a pump-cylinder and an elevation of the piston or plunger and the valve and its stem; Fig. 2, a vertical sectional view of the piston or plunger and a portion of its rod and an elevation of the valve-stem; Fig. 3, an inverted plan view of the skeleton frame alone; Fig. 4, a plan view of the skeleton frame and disk, the latter being under the former; Fig. 5, a sectional view of the skeleton seat alone, and Fig. 6 a plan view thereof.

The letter A designates a pump-cylinder, of any approved construction, having the usual lower cap and lift or suction pipe, B, into which cylinder the valve is seated and the piston or plunger is fitted to work.

The letter C refers to the piston-rod, the lower portion whereof, at least, is of tubular form and of two diameters—one to allow the enlarged end D of the valve-stem to stand within the piston-rod while it is moved up and down, and the other to receive the body of the stem, as shown. The lower end of the piston-rod is supplied with a piston or plunger, which acts within the cylinder to suck or lift the water in the usual way, and there may, of course, be the usual upper piston or plunger in cases of double-acting pumps, as suggested by the dotted lines in Fig. 1. The lower end of the stem is also connected with a check-valve that fits snugly and firmly in the seat therefor, as in the cylinder shown, in which the valve's periphery impinges so snugly against the walls thereof as to frictionally maintain the valve in its place. As already suggested, it will be seen that the piston and its rod may be freely operated without disturbing the valve; yet, when it is desired to remove the valve for repairs or substitution by a new one, it may readily be done by simply withdrawing the piston-rod, the shoulder within it engaging the larger end of the stem and lifting and conducting the valve out of

the pump. In replacing the valve it is only necessary to follow it with the rod and piston and to tap it with the lower part of the piston till it is properly down in its seat.

5 Referring, now, to the particular form of piston and valve illustrated in the present instance, and by preference, though not necessarily, used, and which are alike, the letter E refers to the threads on the rod and stem, on
10 which nuts F, forming shoulders, are screwed. The shoulders, however, may be stationary, if desired. Below the shoulders are placed flexible disks G, of leather or other material, forming
15 flaps, to cut off the downflow of water, and beneath these disks metallic skeleton frames H are placed over the rod and stem. These frames are of annular form, and have eyes J, which receive the rod and stem, (presently to
20 to be described,) and around which depend hubs J', adapted to enter eyes in the seats. They also have a number of water-passages, K, divided by spokes L. The lower faces of the frames are provided with annular ledges or beads having receding faces N, into which
25 project the upwardly-extending annular ledges or beads O of the skeleton seats P. These seats have screw-threaded eyes, which screw on the rod and stem, and whose upper parts are enlarged to receive the hubs J', by which the
30 frames and seats are kept from moving to one side of each other to prevent the packing from coming loose. They are also provided with a number of water-passages, Q, divided by spokes R, similar to or like those of the frames H,
35 save that the spokes R are preferably formed with recesses or depressions S, which serve to preserve the proper size of the water-passages in case the spokes of the respective frames and seats do not happen to come one under the
40 other, as suggested by the dotted lines in Fig. 4, the recesses allowing more water to pass round their spokes, by reducing the size of the spokes, than if the recesses were filled in, thus making the size of the passages, even when
45 smallest, as in Fig. 4, still amply large enough for the full capacity of the pump. As seen in Fig. 2, the leather or rubber or other cup-shaped packing T is formed with an inwardly-turned flange, U, which fits between the annu-
50 lar bead M of the frame and the annular bead of the seat, the latter impinging the inner edge of the flange and forcing it around the bead M and somewhat up into the receding face N of the frame H, thereby securely holding the
55 packing. The eyes of the seats are threaded and fit the threads of the rod and stem, as already observed, and thereby enable them to secure the parts without use of nuts for this

purpose, the latter merely acting as jam-nuts rather than as holding-nuts. This is an advantage in practice, because if the nuts are screwed on tightly enough to prevent working off and loss (which requires the parts to be removed from the pump-cylinder, and often proves quite
60 troublesome, as when they slip entirely from the rod and stem) the pressure injures and cuts through the disks G. The above construction avoids these annoyances.

The letter V refers to the jam-nuts.

Again, in manufacturing the device the eyes
70 in the frames are cast sufficiently larger than the rod or stem to allow the same to be easily and quickly placed over the rod or stem; but this, while cheapening the article, renders the eyes so large that the frame will constantly work
75 from side to side and loosen the hold on the packing and in a short time necessitate withdrawing and repairing the device. By means, however, of the depending hubs J' and the enlarged end of the eyes in the seats, both of
80 which are preferably tapering, the frames are effectually held in place and the working loose of the packing entirely avoided, as I have ascertained by constant and severe use.

This piston or plunger and check-valve (for
85 the device is the same in both instances, the function and position merely causing a change in the name) I have found very effective in use, is easily and quickly put together, and the parts subjected to wear readily removed
90 and renewed.

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

The combination, with the rod or stem, of
95 the exterior shoulder, the fixed disk thereon below the shoulder, the annular frame on the rod or stem and next to the disk and having water-passages, an annular downwardly-extending bead on the said frame and a depend-
100 ing hub, an annular skeleton seat having a screw-threaded eye screwed on the rod or stem and enlarged in the upper part to receive said hub and having water-passages and an upwardly-projecting bead which extends within
105 said downwardly-extending bead, a cup-shaped packing having an inwardly-extending flange lying between the bead of the frame and the seat and turned upwardly by the body of the seat, and a jam-nut. 110

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH M. NORMAND.

Witnesses:

WILBER COLVIN,
A. A. YEATMAN.