

H. NORMAN & C. F. DIETRICH.

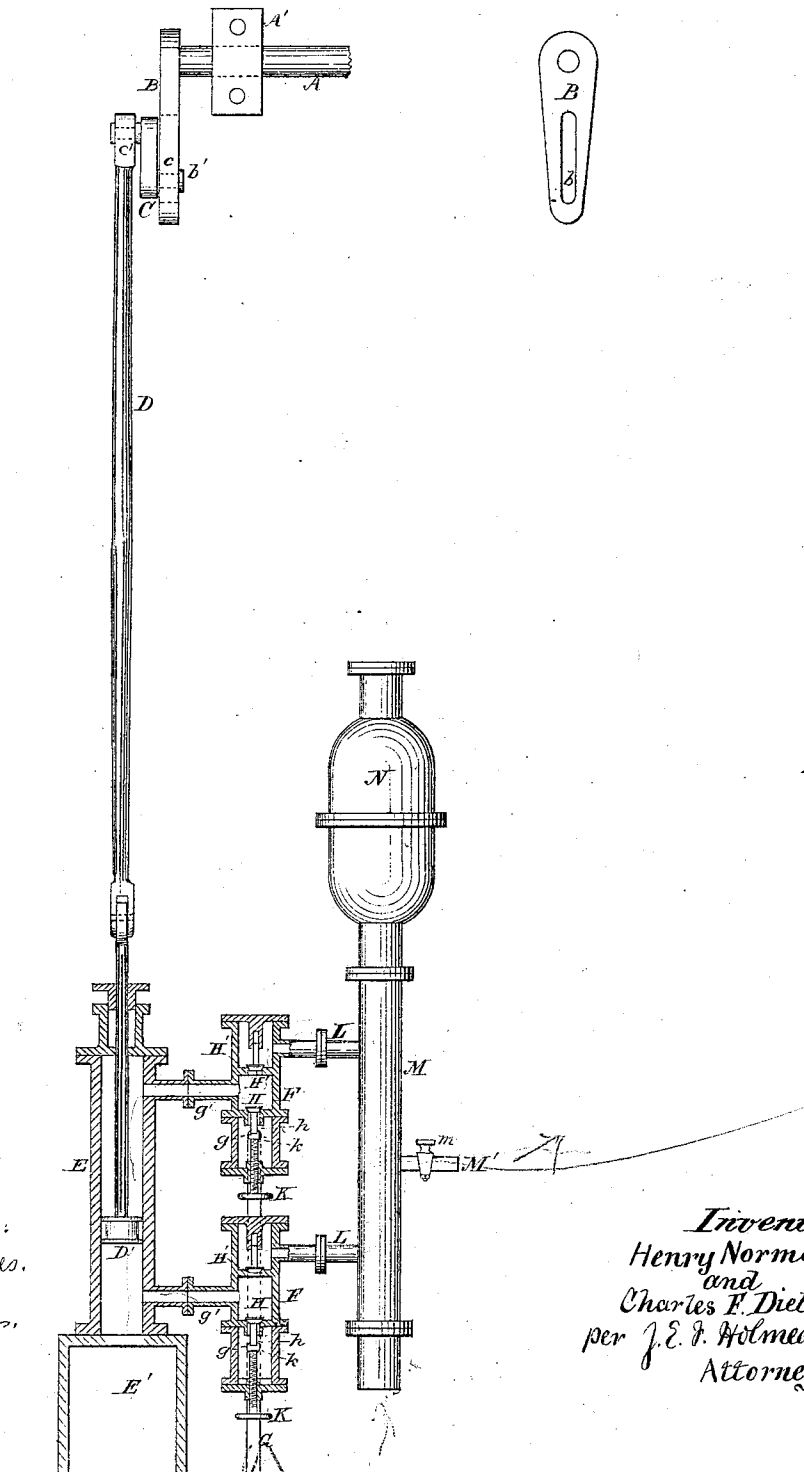
Pumps.

No. 136,258.

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Fig. 1.

Fig. 2.



Witnesses:
Edwin James.
R. E. Gordon.

Inventors:
Henry Norman
and
Charles F. Dietrich
per J. E. F. Holmeads
Attorney.

UNITED STATES PATENT OFFICE.

HENRY NORMAN AND CHARLES F. DIETRICH, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 136,258, dated February 25, 1873.

To all whom it may concern:

Be it known that we, HENRY NORMAN and CHARLES F. DIETRICH, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing and to the letters of reference marked thereon making part of this specification, in which—

Figure 1 is a vertical sectional view. Fig. 2 is a front view of the crank-arm.

The nature of our invention consists in constructing the valve-chamber with two independent valve-chests, each of which is provided with a suction and discharge valve. Into these chests lead lateral supply-pipes, which are connected with the well or reservoir tube, and from each of these chests extends a short pipe, which connects with the piston-cylinder, one leading into said cylinder at a point above that which the highest stroke of the piston ever reaches, and the other at a point correspondingly below. Through stuffing-boxes at the base of each valve-chest are inserted thumb-screws, the points of which approach on such a line the stems of the suction-valves that when desired they can readily be made to lift the same. When these thumb-screws are in such position as to leave the suction-valves free to act, the pump is double-acting; but when one of them is so turned as to lift its respective valve the pump instantly becomes single-acting, and when the screws are turned so as to lift both valves the pump is rendered inoperative; for although the pump, through the action of the piston, may still continue to elevate water to the valve-chests, and thence to draw it to the piston-cylinder, owing to the fact that the suction-valves are held open by the screws, the water when forced back to the chests, instead of through its pressure, lifting the discharge-valve for its escape, it is forced back through the already open valve toward the suction-pipe.

The great advantage of this arrangement is that simply by turning a screw either of the valves can be rendered inoperative, and which, when occasion requires, permits of the discharge force of the pump being instantly reduced one-half.

Another most important advantage is that, although the piston is or may be connected with the main shaft through which all the machinery is driven, should it become desirable for any reason to interrupt or check the discharge of the pump, you simply have to lift through the screws both suction-valves, and the pump is practically inoperative, though the main shaft continues to drive its piston-rod and the other features of the mechanism in connection with which the pump is used, as before.

In the foregoing recital we have not alluded to the means, hereinafter described, of regulating the stroke of the piston-rod, as we desire to embrace the same as the distinctive subject-matter in an independent application.

The construction and operation of our invention are as follows: A is the main driving-shaft, and is operated by any suitable motor or power. This shaft is journaled in suitable bearings A' A'. To the shaft A is attached, so as to revolve with it, the crank B, which is slotted longitudinally through its face, as shown at *b*, Fig. 2. In this slot *b* is secured, by means of a jam-nut, *b'*, the bearing-pin *c* of the crank-arm C, and to the wrist-pin *c'* of which is attached the jointed piston-rod D, which carries the piston D', and causes it to operate in the cylinder E in the usual manner. The cylinder E is seated on or secured to any suitable support, E.

The great advantage of thus connecting the piston-rod D with the driving-shaft A, through the intermediate mechanism herein described, is that it permits of the stroke of the piston being regulated and controlled at pleasure, as, to change the length of the same, and consequently the force or power of the pump, you simply have to loosen the jam-nut *b'*, and shift the position of the bearing-pin *c*, which is readily done simply by moving it up or down in its slotted bearing, and again fastening it by the jam-nut *b'* at any desired point. Thus the stroke can be increased to any required degree, or diminished so as to only be an inch or half inch; or, if desired, it can be reduced to zero, and which result is attained when the pin *c* is secured at such section of the slot as to leave the center of of the wrist-pin *c'* on a line with the center of the shaft A. Thus, for instance, if the pump

is designed to be used to feed a boiler that exhausts a pound a minute, the pin *c* is so adjusted that the pump will supply in operation exactly that amount; and if the amount required be greater or less, you simply have to shift or alter the position of the pin *c*, and the required change in the amount of water fed or supplied is instantly effected. F F are the valve-chests, and are entirely independent of each other. Into these chests F F lead lateral supply-pipes *g g*, which are connected with the well or reservoir tube G, as shown in Fig. 1. From each of these chests F F extends a short tube, *g'*, which enters the piston-cylinder E, one tube leading into the upper section of the cylinder at a point which shall be always above the highest stroke of the piston, and the other tube entering at a point correspondingly below. In each of these valve-chests F F are arranged, so as to operate freely, a suction-valve, H, and discharge-valve H'. The suction-valve H of each chest is provided with a stem, *h*, which extends some distance below the valve-seat. At the base of each valve-chest, and through a suitable stuffing-box, enters and works the thumb-screw K, the point *k* of which is on a true line with the valve-stem *h* of the suction-valve H, so that when the screw is turned in it strikes the stem of the valve, and can thus be made at any time to instantly lift the valve out of its seat, which will consequently render the valve-chest and its entire system of valves inoperative; for although the water may be elevated into the chests through the pipes *g G*, and thence drawn to the cylinder, when thrown or forced back into the chest its pressure does not lift the discharge-valve H' so as to escape by the pipe L. This it will not do unless the valve H has fallen so as to cut off all other means of discharge. Consequently, so long as the valve H is held open, the water that is returned to the chest from the cylinder E, instead of lifting the discharge-valve H', will simply flow back through the opening in the valve-seat through which it originally entered, and from thence return by the pipes *g G* to the well or reservoir.

Thus it will be seen that the discharge of

the pump can be regulated and controlled, as well as its character changed—that is, be made either single or double acting—simply by moving the thumb-screws K K. When these are turned out so as to leave their points *k k* entirely free of the valve-stems *h h*, leaving the valves H H free to act, the pump is double-acting. When one of these screws is so turned in as to lift the valve H that chest no longer acts so as to discharge, and consequently the pump becomes single-acting. Should occasion require the pump can, at an instant, be rendered inoperative simply by turning in the two screws K K so as to lift and hold open both valves H H. The water discharged through the valves H' H' is carried by the pipes L L to the water-distributor M, or equivalent device or receptacle, from which it is fed by means of the pipe M', which is provided with a stop-cock, *m*. N is an ordinary air-chamber, and communicates with the upper section of the pipe M.

From the foregoing detailed description the operation of the pump, whether used as a single or double acting pump, as also the means of checking its discharge so as to render the device practically inoperative, will all be readily understood.

What we claim as new, and desire to secure by Letters Patent of the United States, is—

The valve-chests F F, having valves H H and H' H', when the former are provided with valve-stems *h h* and the set-screws K K, the whole being so combined and connected with a cylinder and piston and a suitable means of discharge as to operate either as a single or double acting pump, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY NORMAN.

CHARLES F. DIETRICH.

Witnesses as to H. NORMAN:

H. N. JENKINS,

JAMES C. KIDDELL.

Witnesses as to C. F. DIETRICH:

EDWIN JAMES,

JOS. T. K. PLANT.