

(No Model.)

3 Sheets—Sheet 1.

E. D. LEAVITT, Jr.
Pump.

No. 231,059.

Patented Aug. 10, 1880.

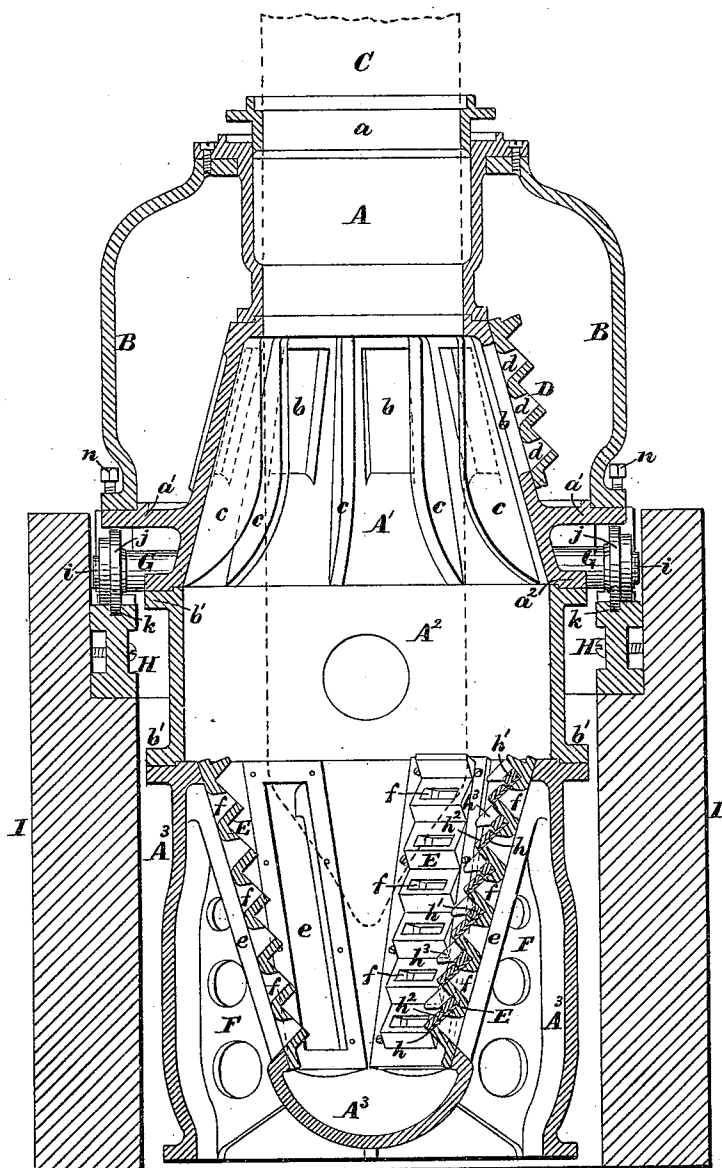


Fig. 1.

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Inventor:

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Attorney.

(No Model.)

3 Sheets—Sheet 2.

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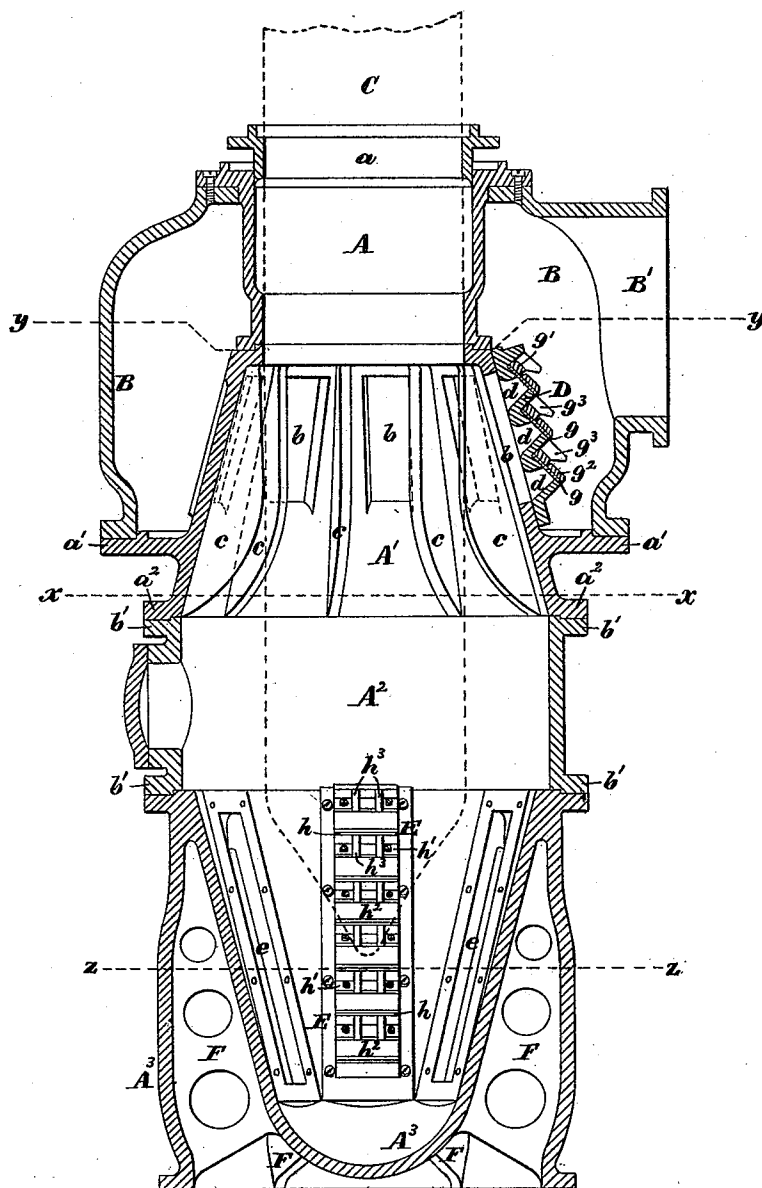


Fig. 2.

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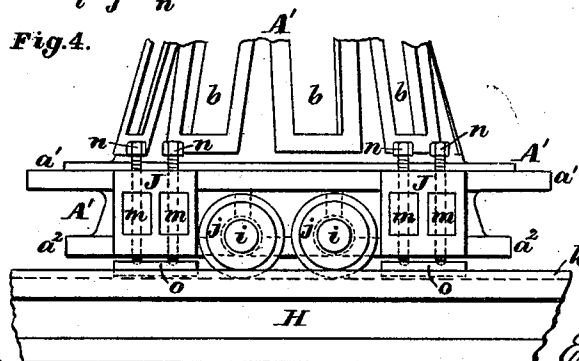
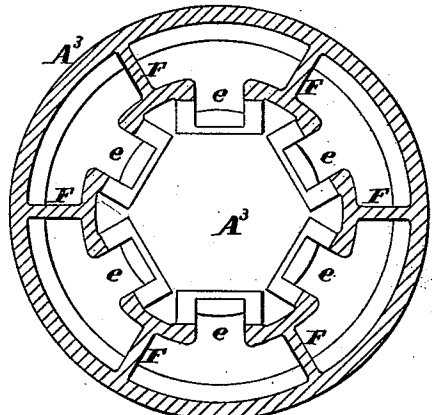
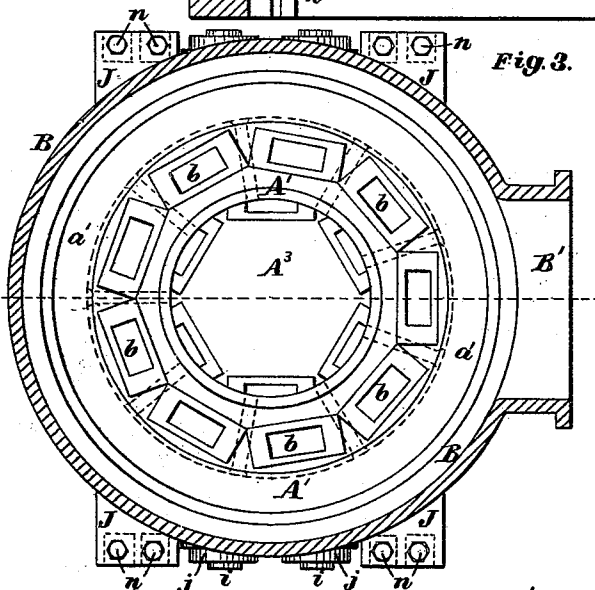
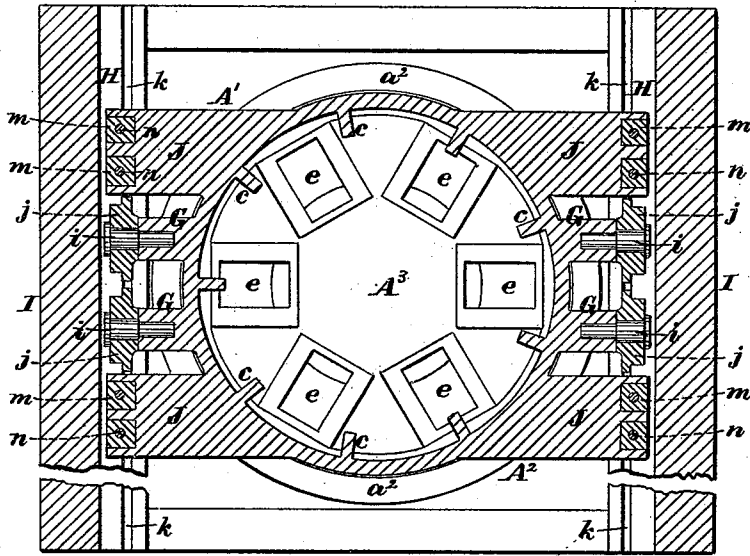
(No Model.)

3 Sheets—Sheet 3.

E. D. LEAVITT, Jr.
Pump.

No. 231,059.

Patented Aug. 10, 1880.



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UNITED STATES PATENT OFFICE.

ERASMUS D. LEAVITT, JR., OF CAMBRIDGEPORT, MASSACHUSETTS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 231,059, dated August 10, 1880.

Application filed March 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, ERASMUS D. LEAVITT, Jr., of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Pumps, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of pumps generally termed "plunger-pumps," and especially to the construction of the pump barrel or cylinder, the construction and arrangement of the valves of said pump-cylinder, and to certain improvements in fitting and hanging said pump barrel or cylinder, whereby it is rendered easily accessible for repairs; and it consists, first, in a pump barrel or cylinder having the lower section of its interior made in the form of an inverted frustum of a cone or pyramid, closed at its lower end, and provided with a series of inlet-openings, arranged equidistant, or nearly so, from each other around the circumference of said conical section, and adapted to be covered upon their inner sides by valves fitted to open inward and resting upon inclined seats so arranged that the water entering said pump-barrel shall tend to keep said valve-seats clean.

It further consists in a pump-barrel having a plunger-guiding cylindrical section provided with a stuffing-box or means of packing the plunger, and a section made in the form of a frustum of a cone or pyramid having a series of openings cut through its inclined walls at equal or nearly equal distances from each other around its circumference, in combination with a series of valves securely attached to the exterior of said conical or pyramidal section and adapted to close said openings, resting upon inclined seats, and to open outward to permit the discharge of water from the pump-barrel, the inclined position of the valve-seats effectually preventing the lodgment of sediment thereon, and the consequent inoperativeness of the valves.

It further consists in the combination, with a pump barrel or cylinder, of a series of clusters of eduction-valves arranged at intervals around the exterior circumference of said barrel or cylinder, and secured thereto in position inclined to the axis of the pump-barrel, with

the upper valve of each cluster nearest to said axis, and adapted to open outward to permit the discharge of water from said pump barrel or cylinder, as will be hereinafter described. 55

It further consists in the combination, with a pump barrel or cylinder, of a series of clusters of induction-valves arranged at intervals around the interior circumference of said barrel or cylinder, and secured thereto in positions inclined to the axis of the pump-barrel, with the upper valve in each cluster farthest from said axis and adapted to open inward to permit the passage of water to the interior of said barrel or cylinder. 60 65

It further consists in the combination of a pump-barrel having a frusto-conical or frustopyramidal section provided with a series of rectangular openings arranged equidistant, or nearly so, from each other around the circumference thereof, a series of skeleton-frames, each adapted to surround and partially cover one of said openings, and provided with two or more ports and a corresponding number of valve-seats, arranged one above the other in the form of steps; but each inclined to the axis of the pump-barrel, and a valve to cover each of said ports and valve-seats, as will be hereinafter described. 70 75

It further consists in a pump barrel or cylinder composed of a plunger-guiding cylindrical section provided with a stuffing-box or means of packing the plunger, two sections made in the form of frustums of cones or pyramids, each provided with a series of openings cut through its inclined wall at intervals around its circumference, said conical or pyramidal sections being arranged with their larger ends toward each other, either with or without an intermediate cylindrical section between them, and the lower or inverted frustum having a closed end, and each having cut through its inclined wall a series of rectangular openings arranged at intervals around its circumference, in combination with a series of clusters of valves secured to the exterior of one of said frustums and adapted to open outward, and a second series of clusters of valves secured to the interior of the other frustum, all of said valves being arranged to rest upon inclined seats and to close the openings in the sides of said frustums. 80 85 90 95 100

It further consists in the combination, with a pump barrel or cylinder, of two pairs of trucks mounted upon suitable journals set in or secured to said pump barrel upon opposite sides thereof, a track composed of a pair of rails, upon which said trucks may rest and along which they may be rolled to move said pump-barrel into a position convenient for repairs, and two or more jack-screws fitted to work in nuts attached to said pump-barrel, with their points or lower ends resting upon shoes or blocks, which, in turn, rest upon the track-rails, all so arranged that when said barrel or cylinder is moved into its proper position it may be raised by said jack-screws to remove the weight from the trucks to the screws and blocks, as will be described.

Figure 1 of the drawings is a central vertical section of my improved pump-cylinder, the cutting-plane being transversely of the supporting-rails and the walls of the pump-well. Fig. 2 is another central vertical section of said cylinder, with the cutting-plane at right angles to that of Fig. 1. Fig. 3 is a horizontal section on line *x x*, Fig. 2, with the valves removed. Fig. 4 is a horizontal section on line *y y*, Fig. 2, with the valves removed. Fig. 5 is a horizontal section on line *z z*, Fig. 2, also with the valves removed; and Fig. 6 is a partial elevation of the upper tapering or conical section, with the discharge-chamber removed, and showing the supporting-trucks and jack-screws in position.

A, A', A², and A³ are separate castings, which, when bolted together in the positions shown, constitute the pump barrel or cylinder, the upper portion of which is surrounded by the water-discharge chamber B, from which the water flows through the pipe B'.

The section A of the pump-barrel is made substantially cylindrical, with its upper part chambered or enlarged to receive a packing and the gland *a*, whereby the plunger C (shown in dotted lines in Figs. 1 and 2) is guided in its reciprocating movements, and leakage around said plunger is prevented in a well-known manner.

The section A' of the pump-barrel is made in the form of the frustum of a hollow cone, through the inclined sides of which are a series of rectangular openings, *b b*, arranged at intervals around its circumference, through which the water is discharged from the pump-barrel, said section being bolted at its smallest end to section A, and provided below the openings *b b* with the outwardly-projecting flange *a'*, which is bolted to and supports the chamber B, and at its extreme lower end with the flange *a''*, as a means of bolting it to the plain cylindrical section A², provided with an outwardly-projecting flange, *b'*, at each end.

The section A' is strengthened by means of the inwardly-projecting radial ribs *c c c*, extending from top to bottom thereof between the openings *b b*, as shown in Figs. 1 and 2, and has formed around each of the openings *b b*, upon its exterior, a slightly-projecting flat

seat, to which is bolted, with a packed joint, a skeleton frame or cover, D, provided with a series of ports, *d d*, and a corresponding number of valve-seats, inclined to the axis of the pump barrel or cylinder, and arranged relative to each other somewhat in the form of a flight of steps, as clearly shown at the right of Fig. 1.

The section A³ is made with double walls, the inner one being in the form of an inverted frustum of a cone or pyramid, with its lower end closed and its upper end joined to the upper end of the outer wall in such a manner that the space between the two walls is closed at its upper end, the inclined inner wall having a series of rectangular openings, *e e*, arranged at intervals around its circumference, each surrounded by a raised flat seat upon the inner surface of said wall, to which is fitted and bolted with a packed joint the skeleton-frame E, provided with a series of ports, *f*, surrounded by valve-seats arranged in the form of steps, and inclined to the axis of the pump barrel or cylinder and to a horizontal line, as shown in Fig. 1.

Each of the ports *d* is closed by a flap-valve composed of a flexible pad or sheet, *g*, of leather or rubber, having its upper edge secured to the valve seat by means of the clamping-plate *g'*, and its lower portion weighted by the metal weight *g''*, in a well-known manner, said valve being adapted to open upward and outward to a limited extent as the plunger descends, the limit of the movement of said valve being determined by the stop-rib *g''*.

The ports *f* in the lower section of the pump-barrel are in like manner closed by flap-valves composed of the flexible pad or sheet of leather or rubber *h*, secured by the plate *h'*, provided with the stop-ribs *h''*, and having secured thereto the weight *h''*, all constructed precisely like the valve on the section A', but arranged to open inward when the plunger is moved upward. By this construction and arrangement of the pump-barrel and its valves a liberal opening is provided for the inlet and discharge of the water, while comparatively small valves are used, occupying but little space, thus rendering the pump more compact, and the passage of the water or other liquid through the ports tends to prevent the lodgment of sediment or any obstruction upon the valve-seat to prevent the closing of the valve.

F F are ribs connecting the outer and inner walls of the section A³, and serve to stay or strengthen said section.

Only one series of valves are shown on section A', and the same on section A³; but each of the rectangular openings *b b* and *e e* is in practice to be covered by a similar series of valves.

The lower end of the section A' has cast thereon and projecting from opposite sides thereof the bosses G G G G, in the outer end of which are set the journal-studs *i i i i*, upon which are mounted the supporting-trucks *j j j j*, flanged as shown, said trucks resting upon and adapted to be rolled along the rails H H, sup-

ported upon the walls *II* of the pump-well, said trucks being guided by their flanges, which fit into and roll along the grooves *kk*, formed in the upper edge of the rails *HH*, as shown in Figs. 1, 3, and 6.

J J J J are arms projecting from the lower end of section *A'*, parallel with the bosses *GG* and with each other, in the outer end of each of which are formed two pockets, to receive a Muntz-metal or composition nut, *m*, in which works the jack-screw *n*, the lower end of which rests in a socket formed in the steel shoe *o*, resting upon the rail *H*, as shown in Fig. 6.

When the pump-barrel is in its proper position for working the screws *n* are screwed down upon the shoes *o* to raise the trucks *jj* off from the rails *H* and transfer the weight of the pump-barrel from the trucks to the jack-screws *n n n n*; but when it is desired to move the pump-barrel into a position more easy of access the screws *n* are turned in the opposite direction till the trucks *jj* bear upon the rails *HH* and the weight of the pump-barrel is transferred from the screws *n* and shoes *o* to the trucks *jj*, when, the connections between the pump-barrel and the mechanism for operating the plunger having been severed, the pump-barrel may be rolled along the rails *H* into a convenient position for repairs with the expenditure of very little force, and when the repairs are completed it may be readily and easily rolled into position and raised by means of the screws *n*, as before described.

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

1. A vertically-situated pump barrel or cylinder having the lower section of its interior made in the form of the frustum of a cone or pyramid, with its lower end closed, and having a series of openings through its inclined sides arranged at intervals around its circumference, and adapted to be covered each by one or more valves arranged to rest upon inclined seats within said pump-barrel and to open inward, substantially as described.

2. A pump barrel or cylinder having a plunger-guiding section provided with a stuffing-box or means of packing the plunger, and a section made in the form of a frustum of a cone or pyramid, and having one or more series of openings through its inclined walls, the opening of each series being arranged at intervals around its circumference, in combination with one or more series or rows of valves arranged upon the exterior of said conical or pyramidal section, and adapted to open outward and to close said openings in said inclined walls resting upon inclined seats, substantially as and for the purposes described.

3. In combination with a pump-barrel or cylinder, a series of clusters of flap-valves arranged at intervals around its exterior circumference and secured thereto in positions inclined to the axis of the pump-barrel, with the upper valve of each cluster nearest to said

axis and adapted to open outward, substantially as described.

4. In combination with a pump barrel or cylinder, a series of clusters of valves arranged at intervals around the interior circumference of said barrel or cylinder and secured thereto in positions inclined to the axis thereof, with the upper valve in each cluster farthest from said axis and adapted to open inward, substantially as described.

5. A pump barrel or cylinder having one or more frusto conical or pyramidal sections provided with a series of rectangular openings arranged equidistant, or nearly so, from each other around the circumference thereof, in combination with a series of skeleton-frames, each adapted to surround and partially cover one of said openings, and provided with two or more ports and a corresponding number of valve-seats arranged one above the other in the form of steps, and each inclined to the axis of the pump-barrel, and a valve to cover each of said ports and valve-seats, substantially as described.

6. A pump barrel or cylinder composed of a plunger-guiding cylindrical section provided with means of packing the plunger, and two sections made in the form of frustums of cones or pyramids arranged with their larger ends toward each other, and each provided with a series of openings arranged at intervals around the circumference of its inclined walls, and the lower or inverted frustum having its lower end closed, substantially as described.

7. A pump barrel or cylinder composed of a plunger-guiding cylindrical section and two sections in the form of frustums of cones or pyramids arranged with their larger ends toward each other, each having a series of openings through its inclined walls arranged at intervals around its circumference, in combination with a series of clusters of valves secured to the exterior of one of said frusta and adapted to cover the openings through said frustum and to open outward, and a second series of clusters of valves secured to the interior of the other frustum and adapted to close the openings in its walls and to open inward, substantially as described.

8. In combination with a pump barrel or cylinder, the trucks *jj*, mounted upon journals set in the side of said barrel or cylinder, and adapted to roll upon the rails *HH*, all arranged for operation substantially as described.

9. The combination of a pump barrel or cylinder, the trucks *jj*, jack-screws *n n*, nuts *m m*, and shoes *o o*, all arranged and adapted to operate substantially as described.

Executed at Boston, Massachusetts, this 23d day of March, A. D. 1880.

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Witnesses:

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