(No Model.) 3 Sheets—Sheet 1.

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M. L. HINES, Executrix, and C. C. HINES, Executor.

PUMP.

No. 387,074. Patented July 31, 1888.

Fig. 1.

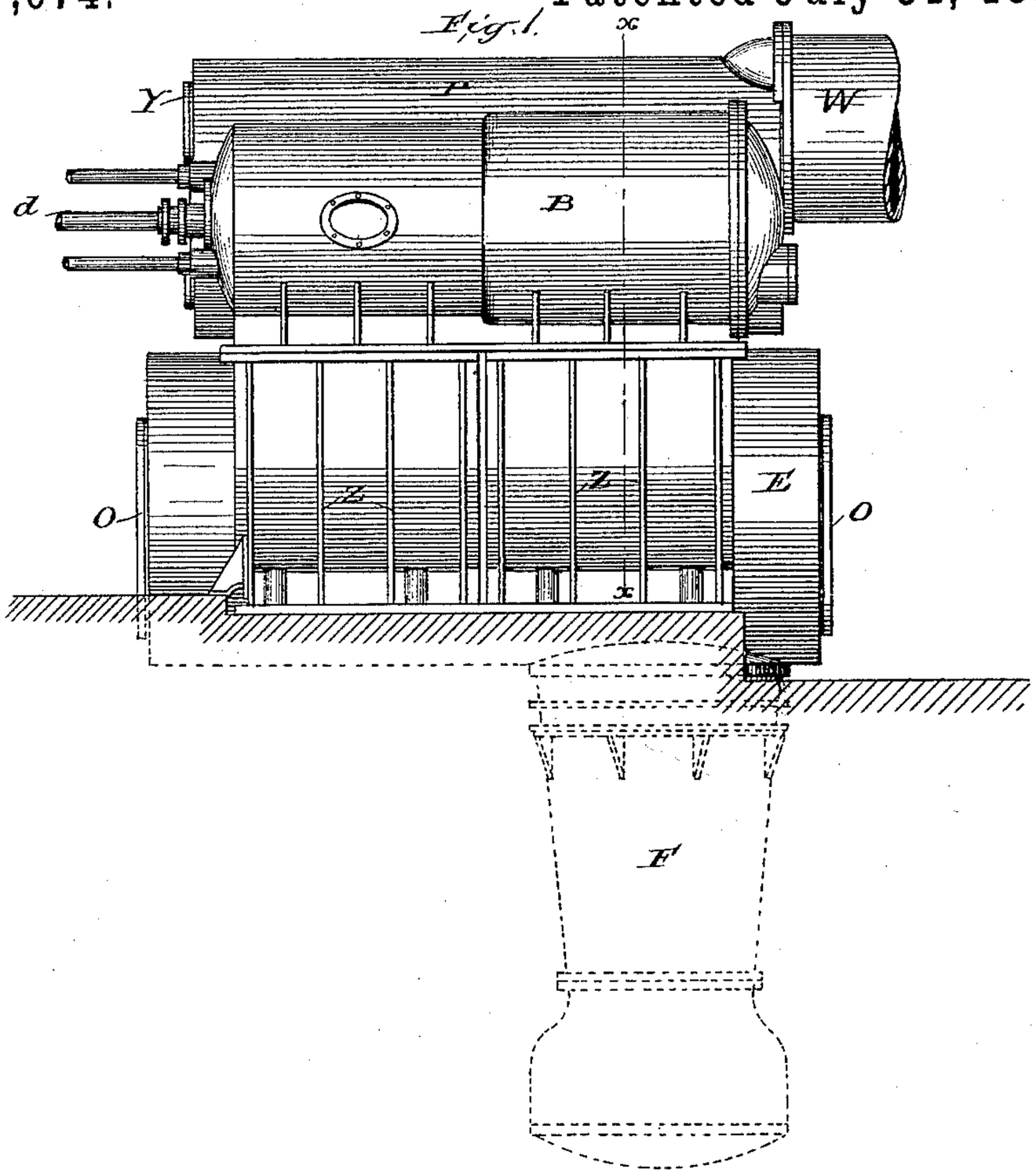

Fig. 2.

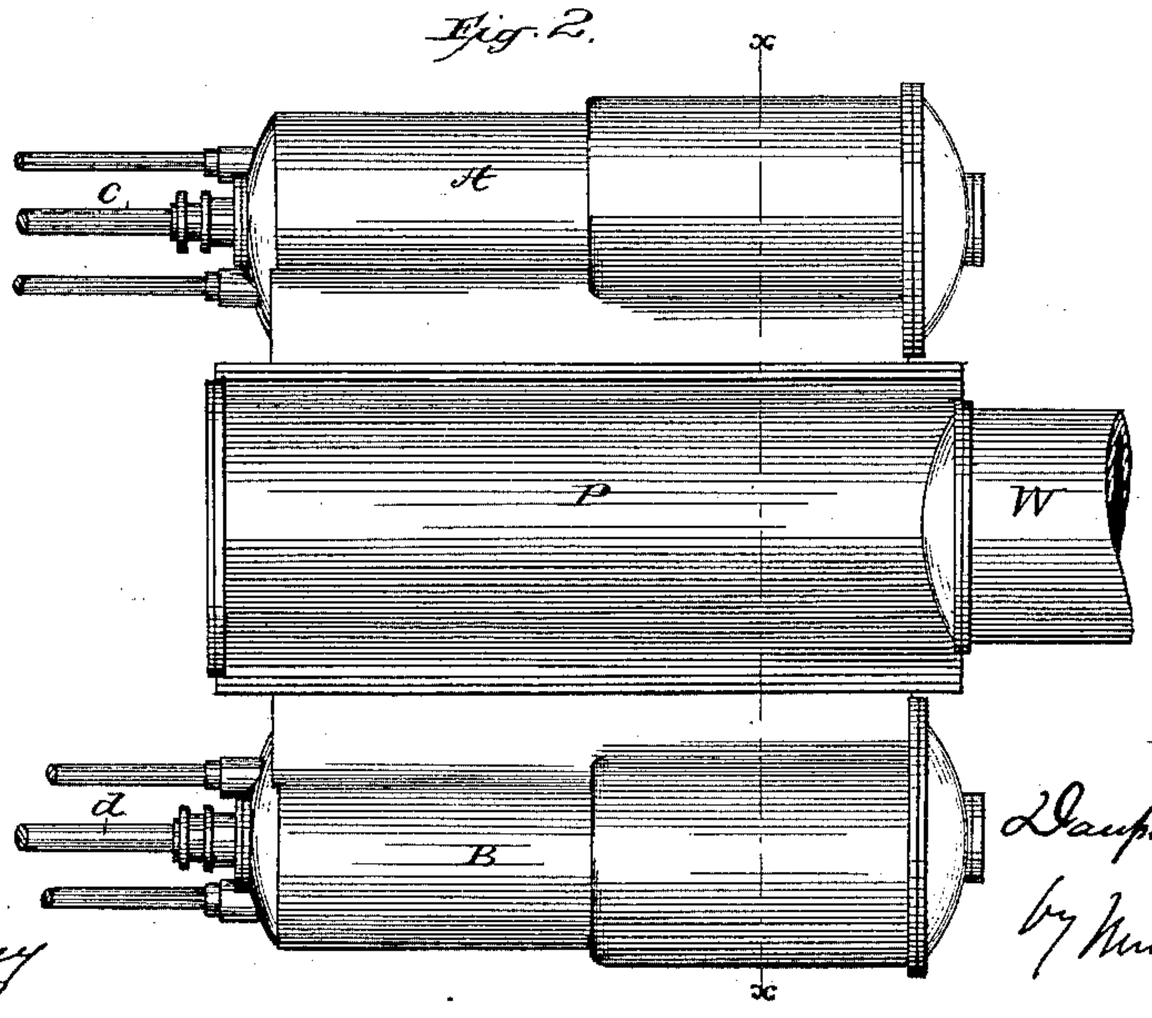

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Fig. 4.

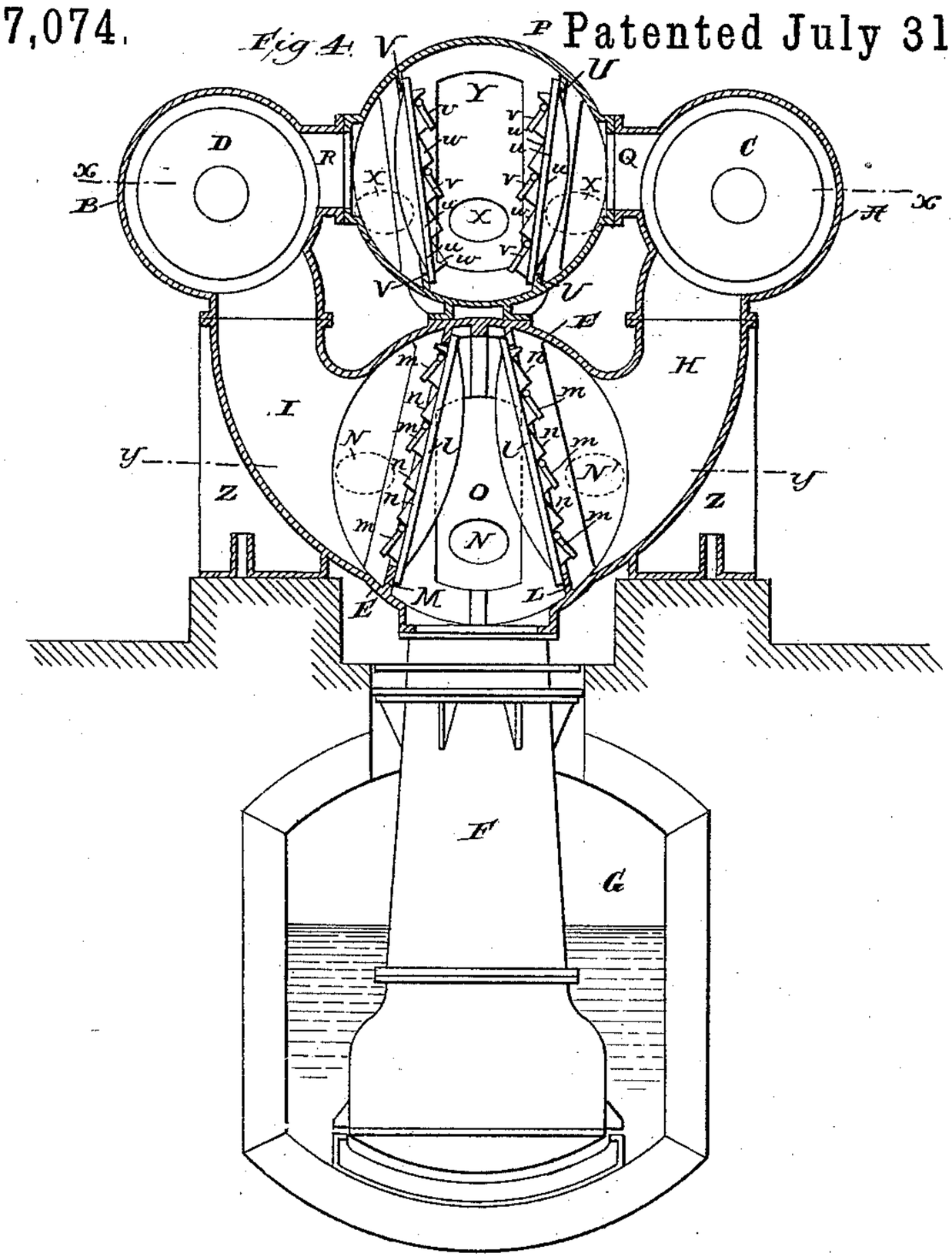
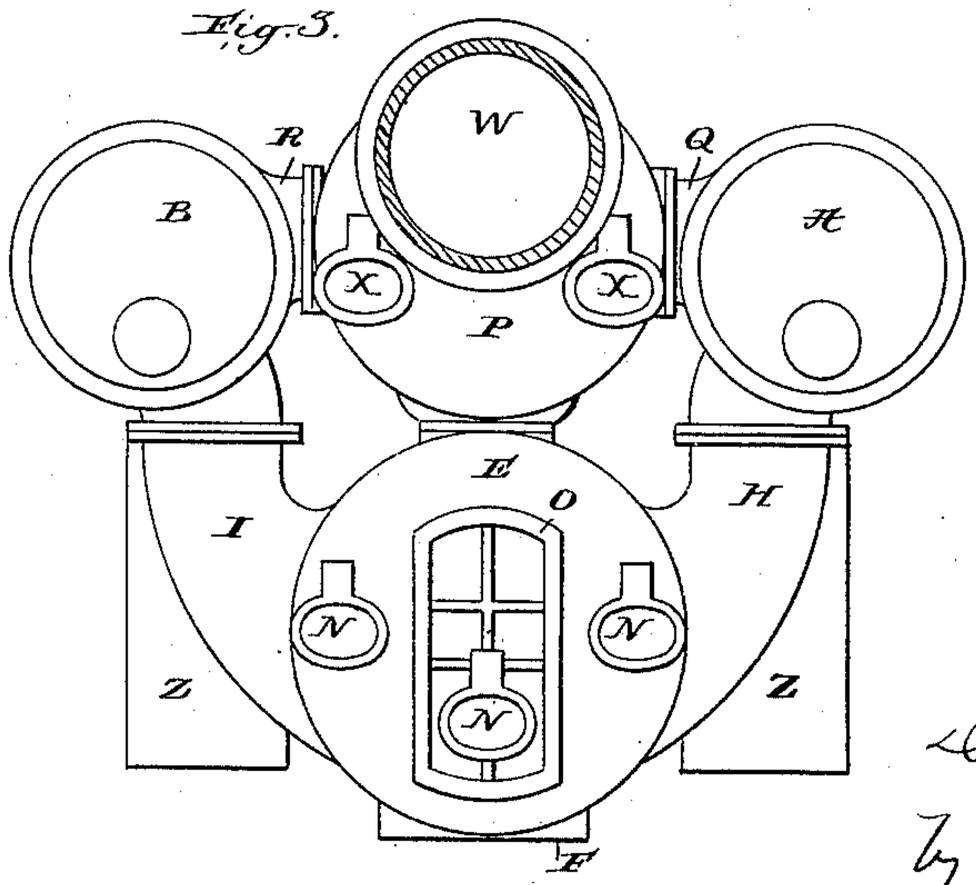


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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PUMP.

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Fig. 5

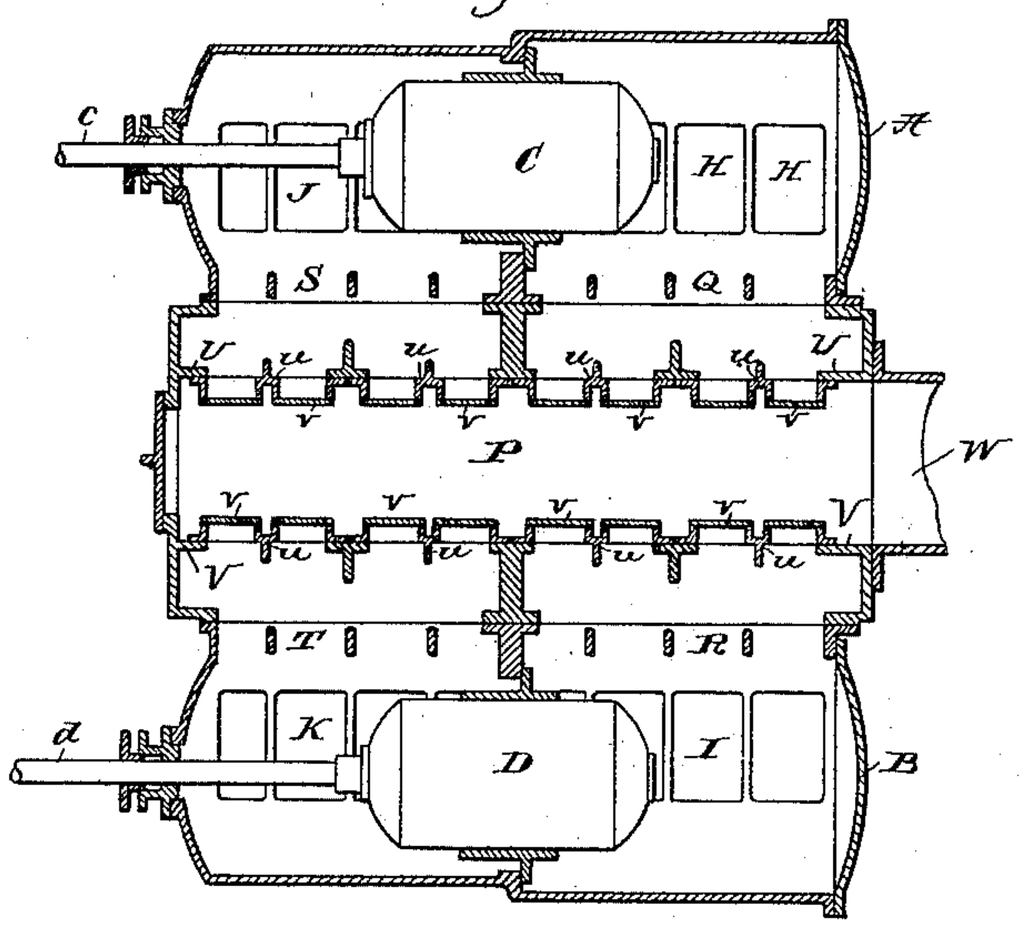


Fig. 6.

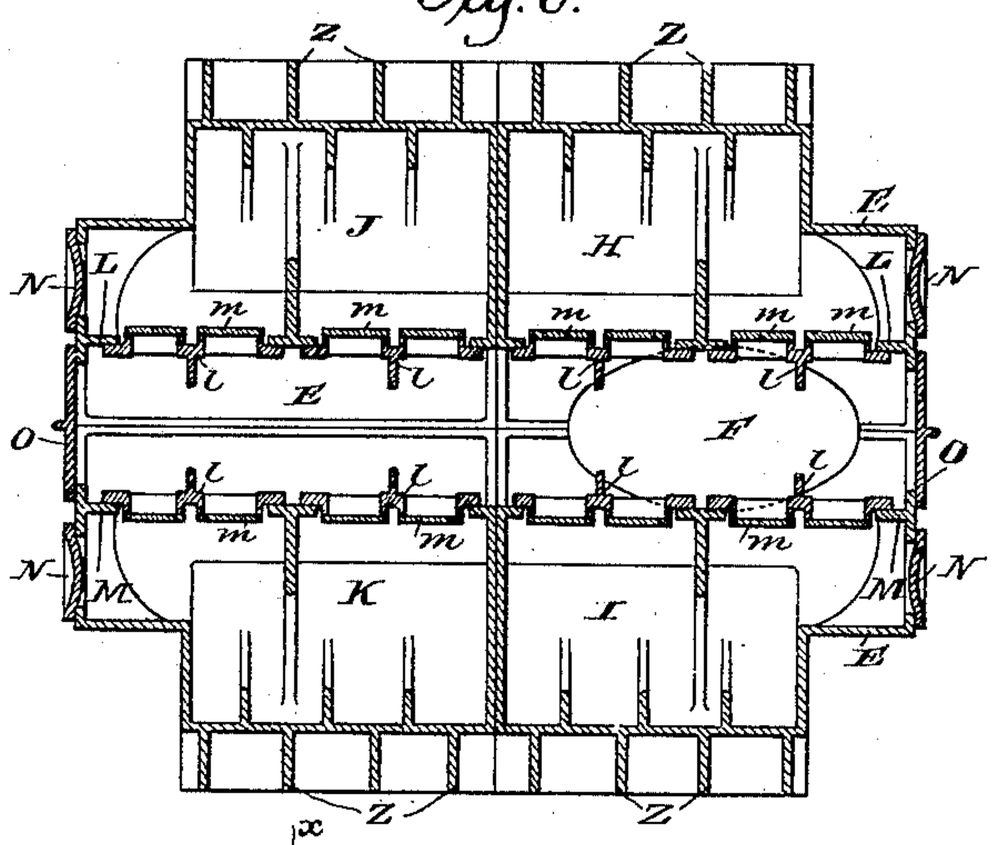


Fig. 7.

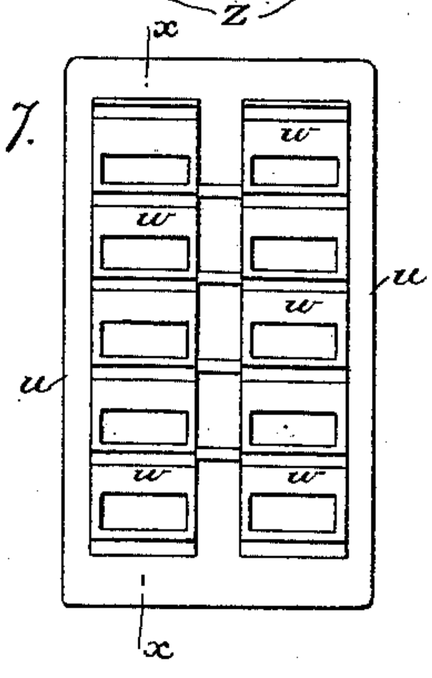
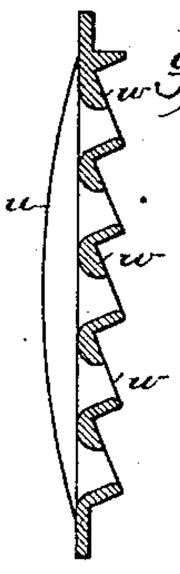


Fig. 8.



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by Munn & Philipp

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UNITED STATES PATENT OFFICE.

DAUPHIN S. HINES, OF BROOKLYN, NEW YORK; MARIA L. HINES, EXECUTRIX, AND CYRUS C. HINES, EXECUTOR, OF SAID DAUPHIN S. HINES, DECEASED, ASSIGNORS TO WILLIAM A. PERRY, OF BAY RIDGE, AND CHARLES C. WORTHINGTON, OF IRVINGTON, NEW YORK.

PUMP.

SPECIFICATION forming part of Letters Patent No. 387,074, dated July 31, 1888.

Application filed May 14, 1885. Serial No. 165,415. (No model.)

To all whom it may concern:

Be it known that I, DAUPHIN S. HINES, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Pumps, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to that general class of pumps which are provided with two or more plungers, and which are known as "duplex-pumps," it being the object of the invention to provide a pump of this character which shall be especially adapted for use in discharging the contents of sewers and for other similar purposes, where the water which passes through the pump is liable to contain a large amount of sediment or débris.

To this end the invention consists in certain features of construction and in an arrangement of the various parts, all of which will be hereinafter so particularly explained and pointed out as to render any extended preliminary description unnecessary.

In the accompanying drawings, Figure 1 is a side elevation of the water end of a duplex-pump embodying the present invention. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation of the same, looking from the right of Figs. 1 and 2. Fig. 4 is a cross-section of the same taken on the line *x x* of Figs. 1 and 2. Fig. 5 is a horizontal section taken upon the line *x x* of Fig. 4. Fig. 6 is a similar view taken upon the line *z z* of the same figure. Fig. 7 is an elevation of one of the plates which carries the force-valves, and Fig. 8 is a section of the same taken upon the line *x x* of Fig. 7.

Referring to said drawings, it is to be understood that A B are the two water-cylinders of the pump, which are constructed and arranged in substantially the same manner as is common in pumping-engines of the duplex class, except that they are located a somewhat greater distance from each other than is common in those pumps which are designed for ordinary pumping purposes. These cylinders are provided with ordinary plungers, C D, the rods *c d* of which pass through stuffing-boxes in the ends of the cylinders in the usual manner and are connected directly to the pistons of the steam end of the pump.

The steam end of the pump is not illustrated in the drawings, because it has no relation to the present invention. It may be constructed in any of the ways in which the steam ends of duplex pumps are commonly constructed.

The suction-chamber E is made of very large size in order to secure the necessary area for the valves, and, in order to secure the necessary strength with the least amount of metal, is made cylindrical in form. The chamber is located below and between the water-cylinders and is provided with a large suction-pipe, F, which communicates directly with the sewer G or other place from which the water is to be drawn. The suction-chamber is provided with two longitudinal partitions, L M, by which it is divided into three compartments, the compartment between the partitions communicating with the suction-pipe F, while the compartments upon the outsides of the partitions communicate with four large passages or ducts, H I J K, leading to the opposite ends of the respective water cylinders. The partitions L M are arranged in vertical or substantially vertical positions, and are provided with large openings, which are covered by plates *l*, carrying the suction-valves *m*. The plates *l* are provided upon their outer sides with the seats *n* for the valves, and these seats, as will be observed, are so arranged that the valves occupy an inclined position. Only a part of the valves are shown in Fig. 4. The valves *m* may be of the ordinary hinged construction, as shown, and so arranged that they swing upward to open and fall downward onto their seats by their own weight. If preferred, the valves may be formed of pieces of flexible material—as leather or rubber—fastened at their upper edges to the seats. The chamber E is provided at its opposite ends with hand-holes N, through which access can readily be had to both sides of the valves, and also with man-holes O, through which the plates *l*, carrying the valves, can be inserted and removed. These holes O also afford means by which a

person can, when desired, enter the suction-chamber and pass along in the compartment between the partitions L M to clean the valves or for any other purpose. This vertical arrangement of the plates carrying the valves is a feature of great importance in a pump of this character, as it prevents sediment or débris from settling and accumulating upon the valves when the pump is not in operation, and thus rendering the valves inoperative.

The construction and arrangement by which a person is enabled to enter the suction-chamber and pass along between the plates carrying the valves is also a feature of great importance in a pump of this character, as, owing to the character of the work which the pump is to perform, the valves are liable to become frequently clogged or deranged, and, owing to the large size of the pump, great labor would be involved if it were necessary to remove the valve-plates or valves whenever cleaning or repairs were necessary.

The force-chamber P is located directly above and upon the suction-chamber and between the water-cylinders A B, and is similar in construction to the former, it being of large size and cylindrical in form. It is provided with two vertical or substantially vertical partitions, U V, which extend longitudinally of the chamber and divide it into three compartments. The compartment between the partitions U V communicates with the large discharge-pipe W, through which the water is discharged in the usual manner. The compartments upon the outsides of the partitions U V communicate with four large passages or ducts, Q R S T, leading from the opposite ends of the respective water-cylinders. The partitions U V are provided with large openings, which are covered by plates *u*, carrying the force-valves *v*. The plates *u* are similar to the plates *l*, and are provided upon their inner sides with seats *w* for the valves, and these seats, like the seats *n* for the suction-valves, are so arranged that the valves occupy an inclined position. These valves *v* are similar in construction to the suction-valves, and are so arranged that they swing upward to open and fall downward onto their seats by their own weight. The force-chamber, like the chamber E, is also provided at its opposite ends with hand-holes X, through which access can be had to the chamber upon both sides of the valves, and at one end with a man-hole, Y, through which the plates *u* can be inserted and removed, and through which a person can enter the chamber so as to pass along in the compartment between the partitions to inspect or repair the valves, the same as already described in connection with the suction-chamber.

By reason of the vertical arrangement of the partitions U V and of the man-hole Y the same advantages are gained in connection with the force-chamber that have already been stated in connection with the suction-chamber.

It will be observed that by reason of the arrangement of the parts just described the walls of the passages leading from the suction-chamber to the pump-cylinders and from the pump-cylinders to the force-chamber can readily be cast integral with the chambers and cylinders, as shown, and this makes it possible to construct the shell of the pump of comparatively few castings, which greatly simplifies the construction and proportionately reduces the cost. It will also be observed that by reason of this arrangement of the various parts the water-cylinders and force-chamber rest directly upon the suction-chamber, so that it becomes possible to support the whole pump by means of simple projections, as Z, cast upon the sides of the suction-chamber, thus avoiding the necessity of erecting special mason-work for the support of the pump.

What I claim is—

The combination, in a duplex pump, of a horizontally-arranged suction-chamber, a horizontally-arranged force-chamber supported upon the top of the suction-chamber, two horizontal pump-cylinders arranged at the sides of and parallel with suction and force chambers, two vertical or substantially vertical partitions extending the length of each of said chambers and carrying suction and force valves, suction and discharge pipes communicating with said chambers between the partitions, passages H I J K, leading from the outsides of the partitions of the suction-chamber to the opposite ends of each cylinder, and similar passages, Q R S T, leading from the opposite ends of each cylinder to the outsides of the partitions of the force-chamber, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

D. S. HINES.

Witnesses:
B. W. PIERSON,
JAS. W. PARKER.