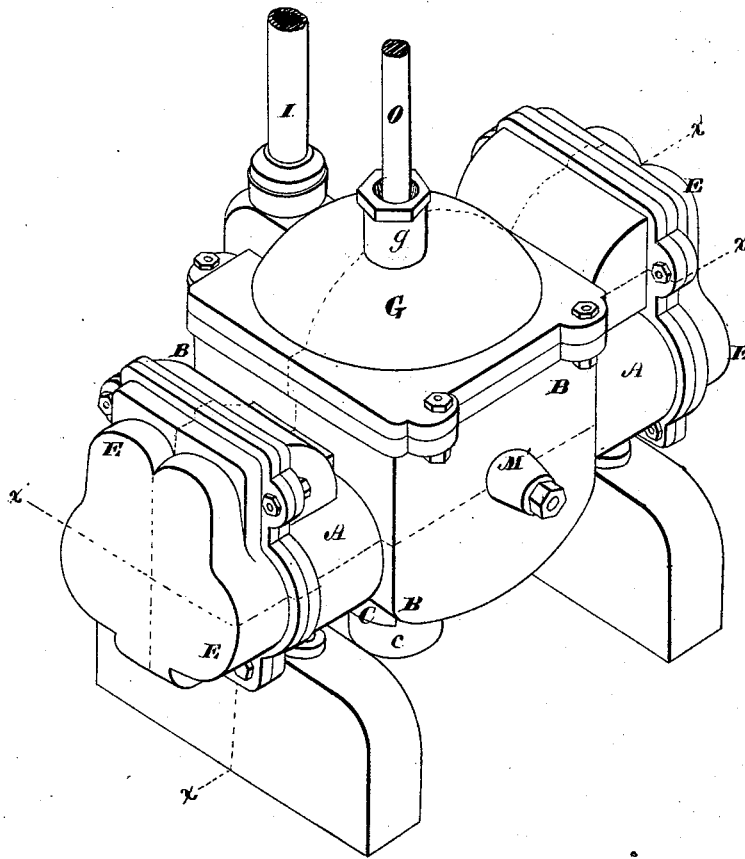


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Pumps.

No. 207,700.

Patented Sept. 3, 1878.

Fig. 1.



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Fig. 2.

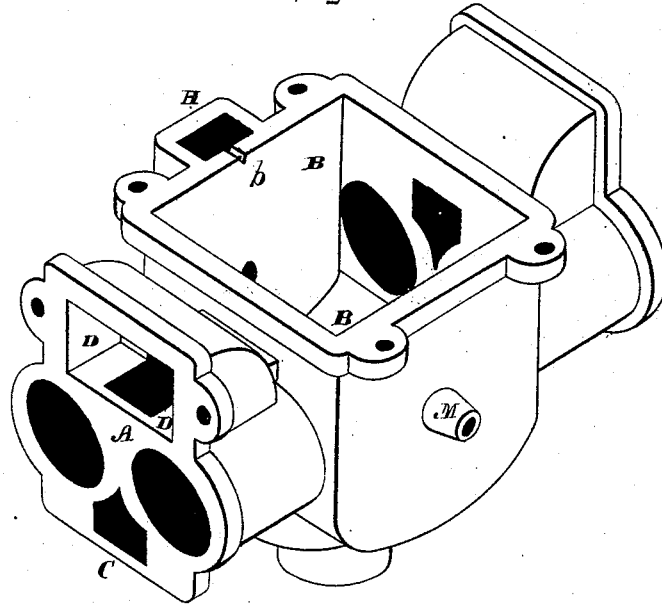
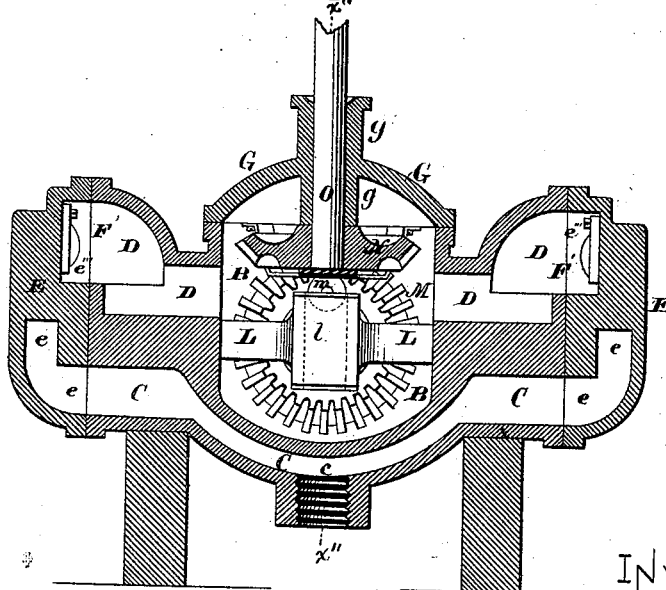


Fig. 3.



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Fig. 4.

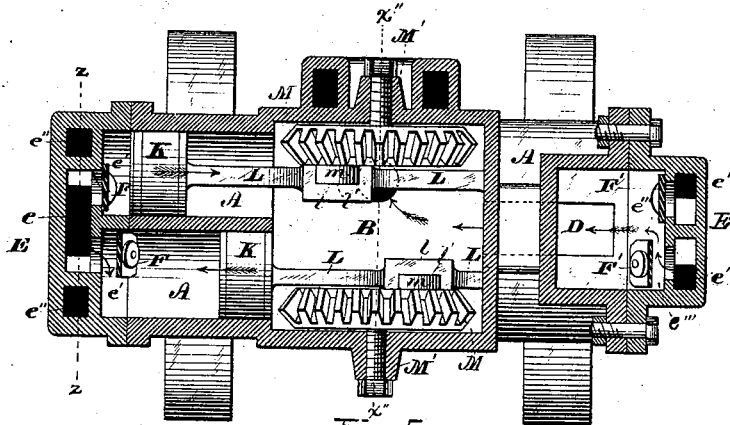
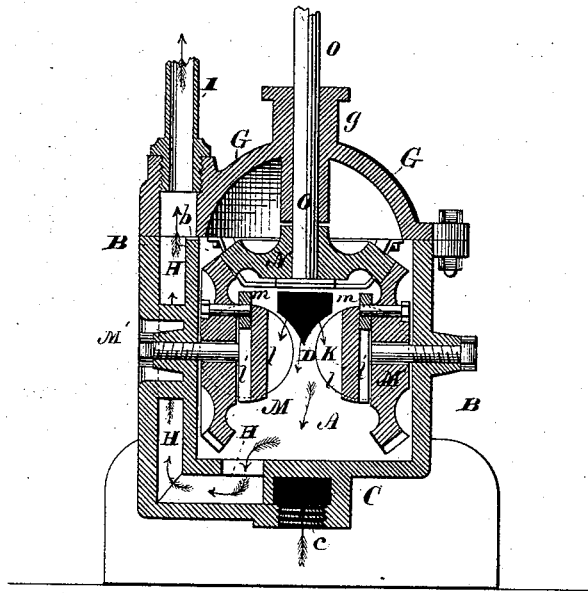


Fig. 5.



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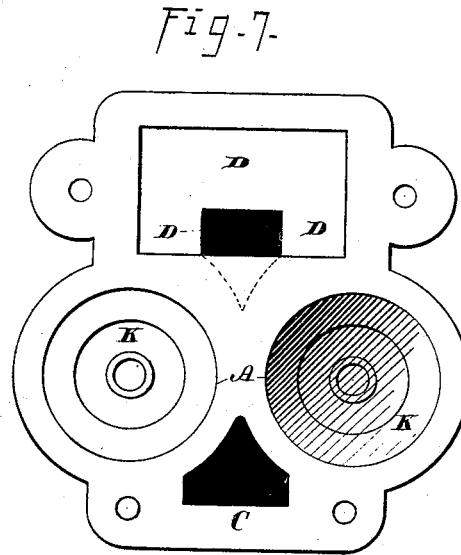
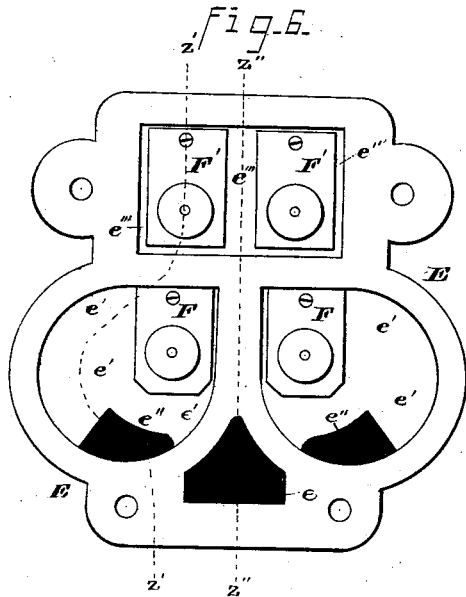


Fig. 9.

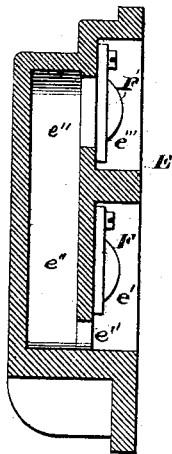


Fig. 8.

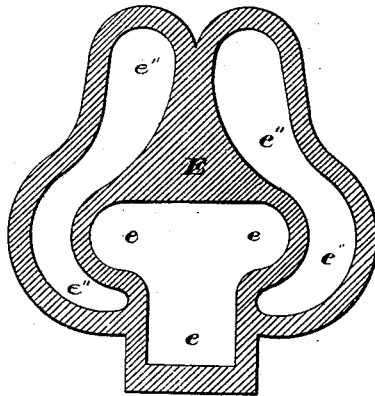
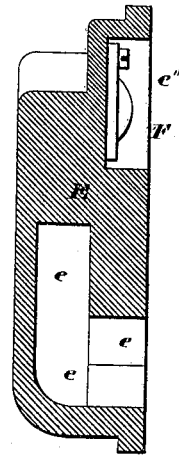


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOHN S. ADAMS, OF ELGIN, ILLINOIS.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 207,700, dated September 3, 1878; application filed July 27, 1878.

To all whom it may concern:

Be it known that I, JOHN S. ADAMS, of Elgin, in the county of Kane, and in the State of Illinois, have invented certain new and useful Improvements in Pumps; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my improved pump. Fig. 2 is a like view of the body of said pump, the cylinder head and dome being removed. Fig. 3 is a vertical central section upon line xx of Fig. 1. Fig. 4 is a horizontal section upon line $x'x'$ of Fig. 1. Fig. 5 is a vertical section upon line $x''x''$ of Fig. 3. Fig. 6 is an elevation of the inner side of one of the cylinder-heads and valve-box. Fig. 7 is a like view of the outer ends of the cylinder at one end of the pump. Fig. 8 is a vertical section of one of the valve-boxes upon line zz of Fig. 4; and Figs. 9 and 10 are vertical sections upon lines $z'z'$ and $z''z''$, respectively, of Fig. 6.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable a constant flow of water to be obtained from reciprocating or plunger pumps, and at the same time to equalize the strain thrown upon the motor; to which end—

It consists, principally, in the construction of the body of the pump, substantially as and for the purpose hereinafter specified.

It consists, further, in the construction of the cylinder-head and valve-box, and its combination with the body of the pump, substantially as and for the purpose hereinafter shown.

It consists, further, in the means employed for operating the plungers of the pump, substantially as and for the purpose hereinafter set forth.

It consists, finally, in the pump as a whole, its several parts being constructed and combined to operate substantially as and for the purpose hereinafter shown and described.

In the annexed drawings, A and A represent two cylinders, which are parallel with each other and united at their contiguous sides, and are connected with two similar cylinders, A, by means of a central chamber, B, that is

inclosed at its bottom and sides and is open at its top, the arrangement being such as to cause the cylinders at each end to have the same axis as the corresponding cylinders upon the opposite end, said parts being cast together.

Upon the lower side of the chamber B is formed a water-passage, C, which extends along the longitudinal axis of the body described, and has its open ends flush with the ends of the cylinders A, while at the center of said passage is provided an opening, c , which extends downward and is arranged to receive the end of a supply-pipe.

Upon the upper side of each pair of cylinders A is provided a pipe or water-passage, D, which at one end communicates with the chamber B, while its opposite outer end is enlarged laterally and vertically, and is flush with the ends of said cylinders.

The ends of each pair of cylinders A and of the pipes C and D are inclosed by a cover or valve-box, E, which has the exterior form shown in Fig. 1, and upon its inner face is provided with recesses that correspond in size and general shape to the open ends of said pipes and cylinders.

From the mouth of the opening C a passage, e , extends upward within the box E and communicates with the upper inner corner of the recess e' , that coincides with the end of each cylinder A, a flap-valve, F, being placed within said recess and arranged to close downward over the upper end of said passage.

Another passage, e'' , within the box E extends from the lower side of each recess e' upward to and opens into the recess e''' , which coincides with the upper pipe, D, the upper end of said passage e'' being inclosed by means of a flap-valve, F', that is placed within said recess e''' , and closes downward and outward.

The upper side of the chamber B is inclosed by means of a dome-shaped cover, G, and at the bottom of said chamber is provided a passage, H, which extends downward, thence laterally outward to the side, and thence upward, and at its upper end communicates with a pipe, I, that is connected with said cover G, and from thence extends to any desired point.

Each cylinder A is provided with a plunger or piston, K, which is connected with a similar plunger, K, in the opposite coinciding cylinder A by means of a rod, L, that is secured to and extends between said plungers. At the longitudinal center of each piston-rod L is a vertical enlargement, *l*, within the outer face of which is formed a vertical right-angled groove, *i*, which receives and contains a round stud or friction-wheel, *m*, that projects outward from the face of a bevel-gear wheel, M, which is journaled upon the inner face of the side wall of the chamber B.

The axes of the cylinders A and wheel M have the same plane vertically, and said wheel is placed midway between the inner ends of said cylinders, so that when the former is rotated its stud or friction-wheel *m* will describe a circle, and will move the rod L and pistons K back and forth, one of said pistons being moved toward, and the other piston moved simultaneously from, the outer ends of their cylinders.

Motion is imparted to the gear-wheels M by means of a bevel-gear wheel, N, which is secured upon the lower end of a shaft, O, that passes downward through a stuffing-box, *g*, in the cover G, said gear-wheel N being arranged to rotate in a horizontal plane and to mesh with said gears M from above. The gears M are adjusted so as to bring their crank-studs *m* one-fourth or one-eighth of a revolution apart, and when the shaft O is rotated the pistons or plungers K, upon opposite sides of the pump, reach the limit of their motion at different times, and thus equalize the power required for their operation, and lessen the shock which would be caused if said pistons reached their limit of motion at the same time.

When the pump is in motion each piston, as it moves inward, draws water through the pipe C, passage *e*, and valve F into the cylinder A, while upon the outward movement of said piston the water is expelled through the passage *e'*, valve F', and passage D into the chamber B, from whence it escapes through the passage H into the delivery-pipe I.

The dome G forms an air-chamber for the pump; and in order that air may not escape through the stuffing-box *g*, said box is extended downward to the upper side of the gear-wheel N. A small opening, *b*, formed between the upper edge of the side wall of the chamber B and said cover G and extending into the side pipe I, enables air to escape from said chamber and the latter to fill with water.

It will be seen that the openings through which water is discharged from each cylinder A and from the chamber B are at the bot-

tom, by which arrangement all sand which may enter either will be readily expelled.

In order that the journal or pivotal bearing M' for the gear-wheel M may be placed in position without passing through the walls of the side pipe H, said pipe at such point is made annular and passes around said bearing.

In consequence of the arrangement of the passages and valves within the valve-box or cylinder-head E, said valves are all exposed when said head is removed, and are easily and quickly accessible for the purpose of repairs, while by removing the cover G all of the operative mechanism of the pump is exposed, and can be readily removed and replaced.

In consequence of the construction of the pump but three joints are to be packed, and by breaking said joints each portion of the interior is exposed and accessible, and all of its operative mechanism may be taken out without rendering necessary the removal of said pump from its supports.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. The hereinbefore-described pump-body, in which the cylinders A, central chamber B, supply-pipe C, passages D, and exit-passage H are combined and relatively arranged, substantially as and for the purpose specified.

2. The combined cylinder-head and valve-box E, provided with the recesses *e'* and *e''*, water-passages *e* and *e'*, and valves F and F', in combination with the body of the pump, substantially as and for the purpose shown.

3. In combination with the plungers K, the rods L, having the vertical grooves *l'* at their longitudinal centers, the gear-wheels M, provided with the studs *m*, the gear-wheel N, and the operating-shaft O, substantially as and for the purpose set forth.

4. The hereinbefore-described pump, in which the cylinders A, chamber B, supply-pipe C, passages D, valve-boxes E, provided with the passages *e* and *e'* and valves F and F', the cover G, the discharge-pipe H and I, the pistons K, the rods L, having vertical central grooves *l'*, the gear-wheels M, provided with crank-studs *m*, the gear-wheel N, and the shaft O are constructed and combined to operate in the manner and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of July, 1878.

JOHN S. ADAMS.

Witnesses:

E. D. WALDRON,
W. K. HOAGLAND.