

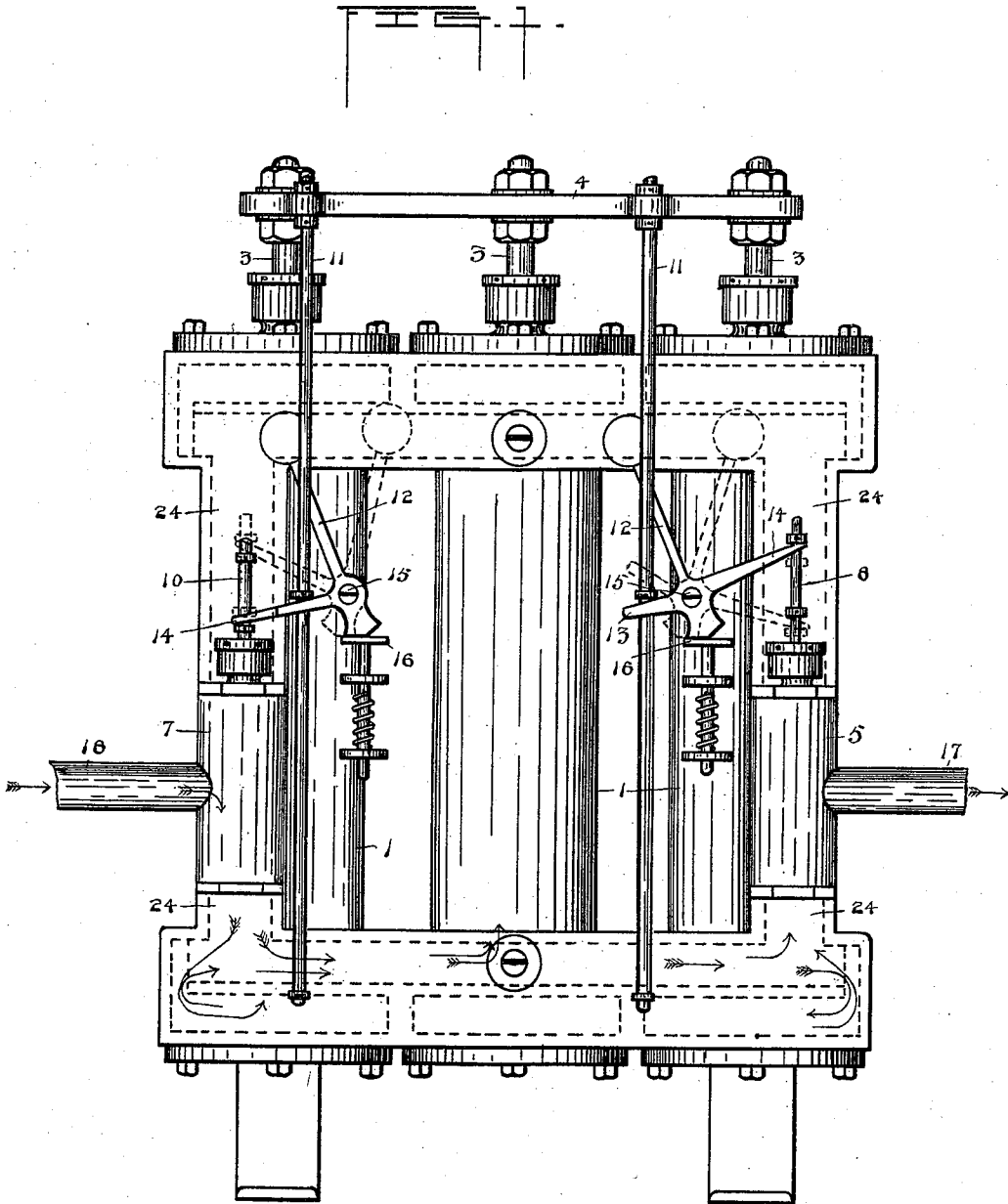
(No Model.)

5 Sheets—Sheet 1.

F. MIS.
PUMP.

No. 539,072.

Patented May 14, 1895.



Witnesses

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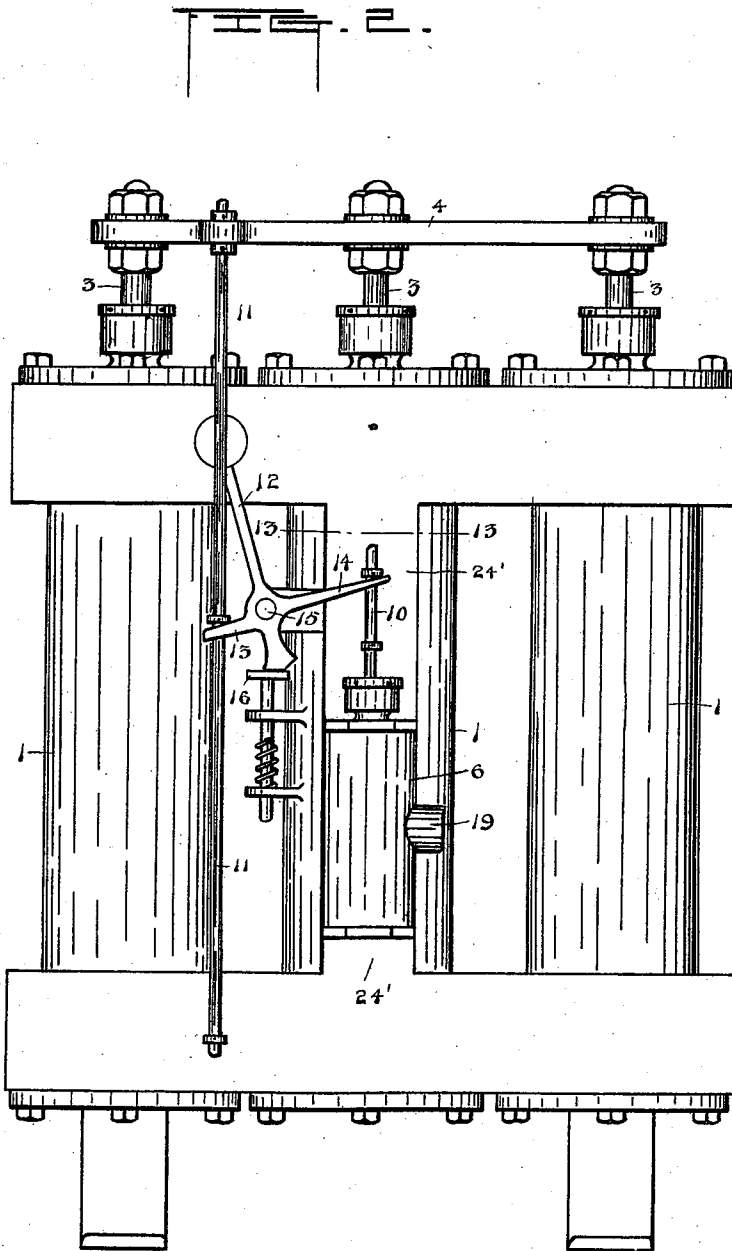
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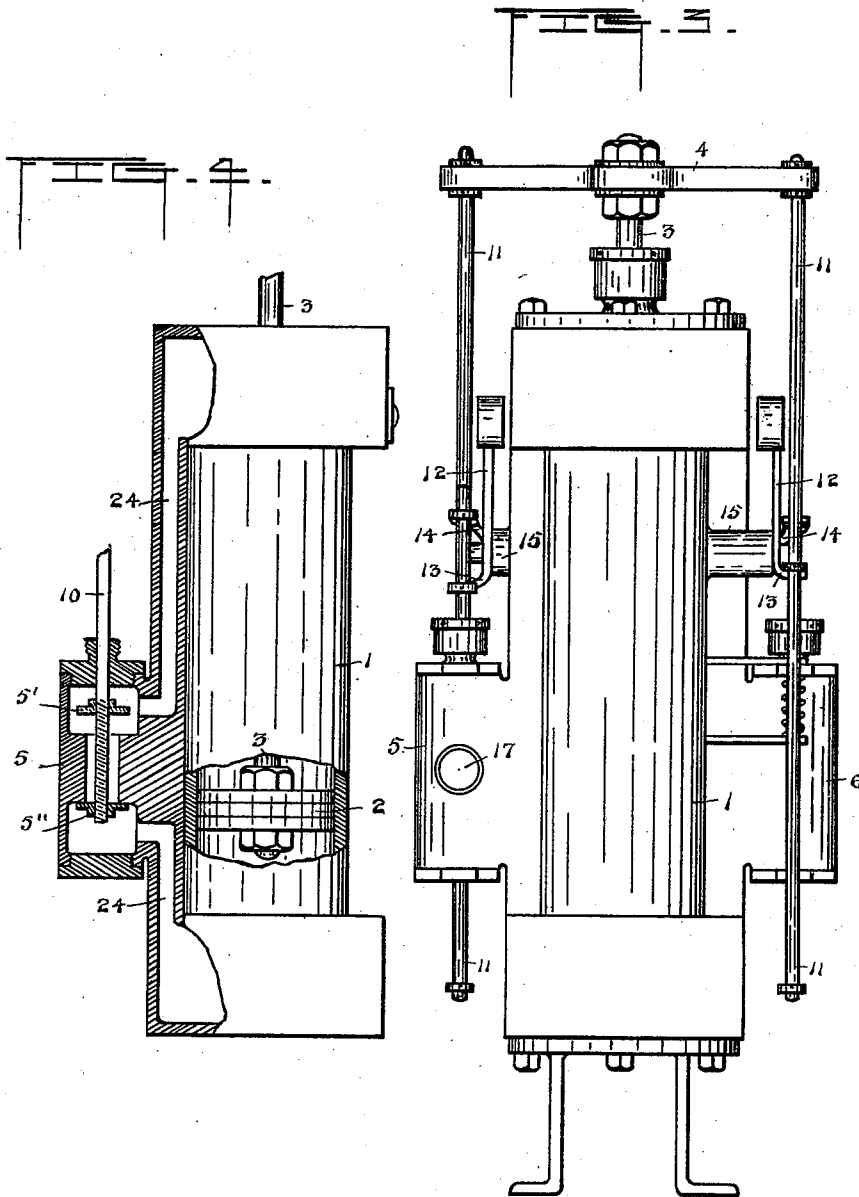
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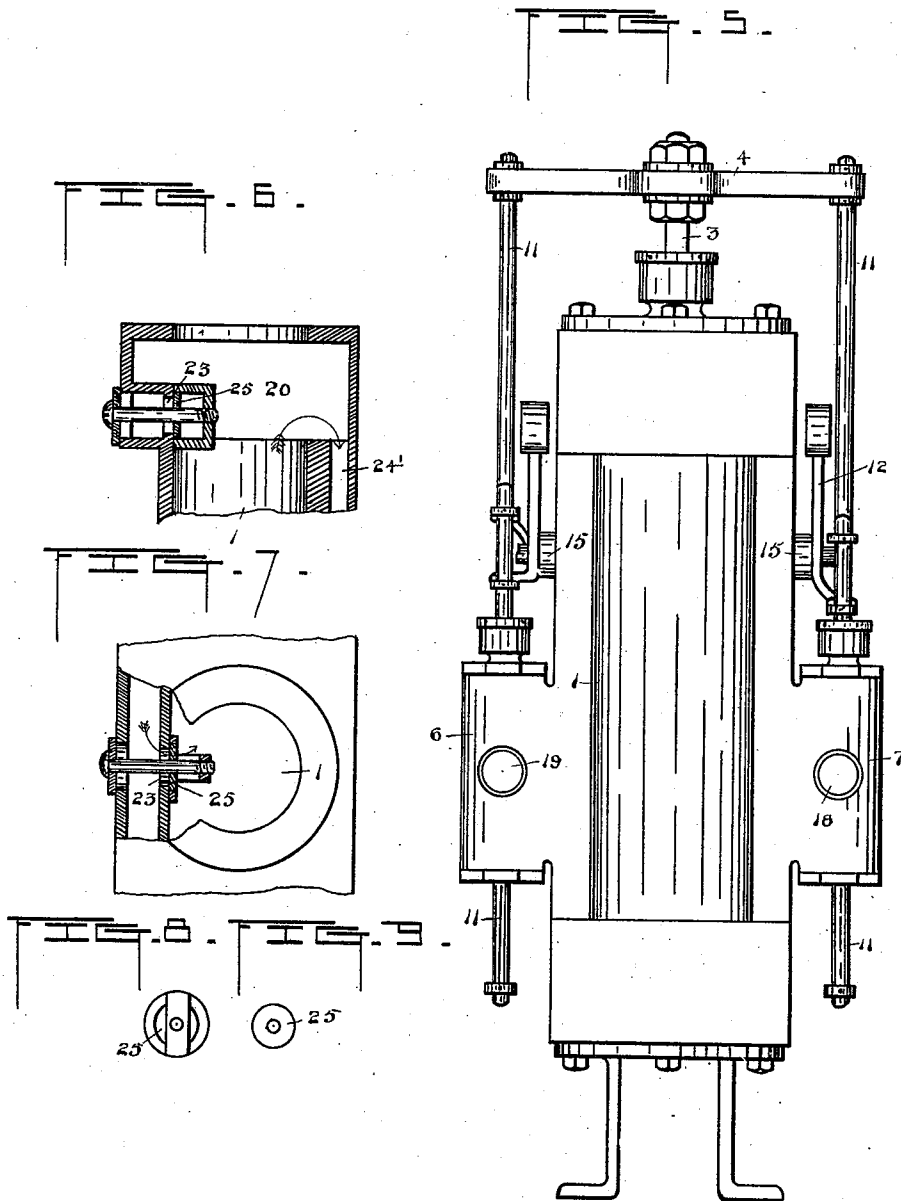
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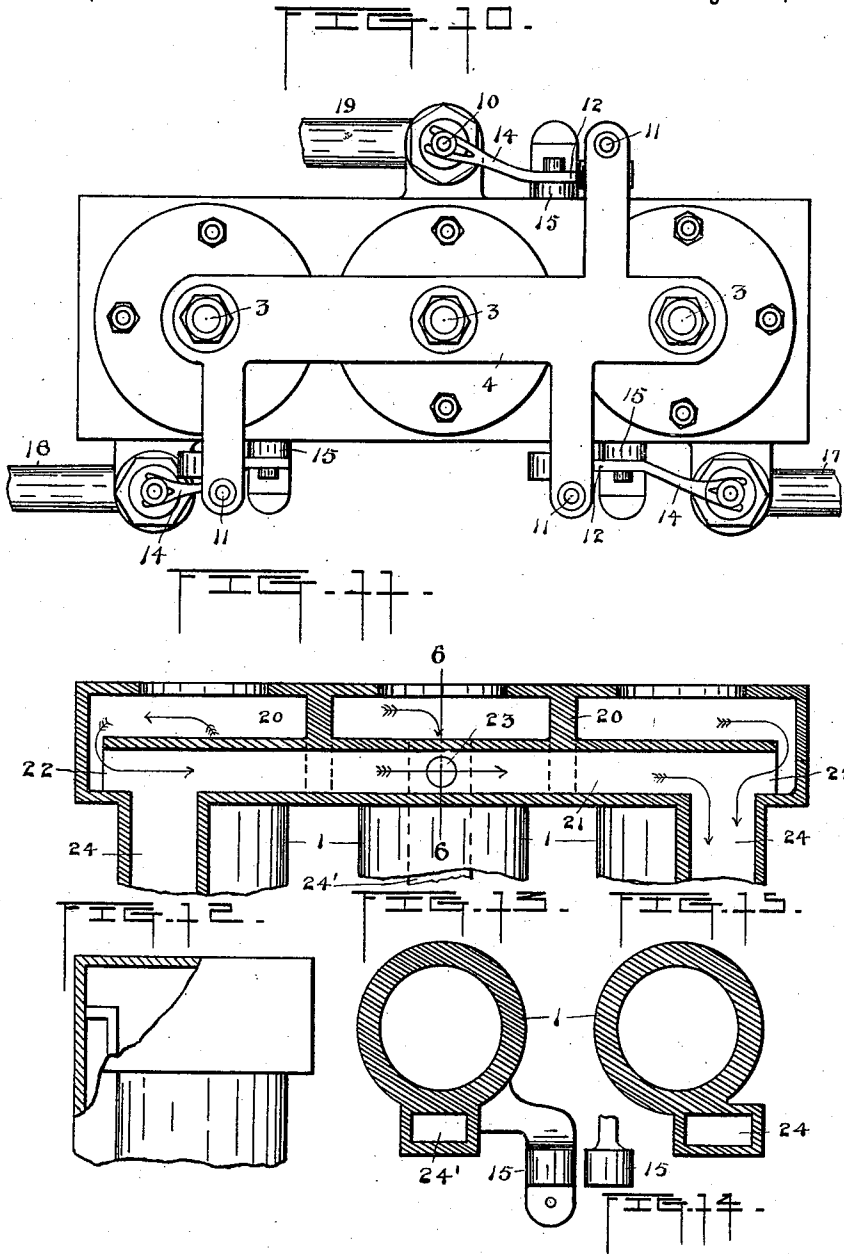
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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 539,072, dated May 14, 1895.

Application filed January 24, 1895. Serial No. 536,073. (No model.)

To all whom it may concern:

Be it known that I, FRANK MIS, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to pumps operated by water pressure and adapted to raise a portion passing through it to a higher level and suitable for use in connection with the water supply of buildings.

It has for its object to simplify and cheapen the construction and increase the efficiency of such devices; and it consists in the matters herein described and particularly pointed out.

In the accompanying drawings, Figures 1, 2, and 3 are respectively front, rear, and end elevations. Fig. 4 is a partial vertical section of a main pump-cylinder and a valve cylinder or chest. Fig. 5 is an elevation of the end opposite that shown in Fig. 3. Fig. 6 is a partial vertical central section of a main middle cylinder on line 6 6 of Fig. 11. Fig. 7 is a broken top plan of said cylinder. Figs. 8 and 9 are plans of details also shown in Figs. 6 and 7. Fig. 10 is a top plan. Fig. 11 is a partial vertical section. Fig. 12 is a broken elevation looking from the right to the left of Fig. 11. Fig. 13 is a transverse section of the main middle cylinder on line 13 13 of Fig. 2, the valve mechanism being omitted. Fig. 14 is a partial side elevation of a bracket, and Fig. 15 is a transverse section of a main end cylinder.

Numerals 1 denote pump cylinders; 2, their pistons; 3, piston rods; 4, a piston-rod cross-head; 5, 6, and 7, valve chests, and 5' and 5'', respectively, upper and lower valves in the chests 5.

8, 9 and 10 indicate valve rods.

Attached to crosshead 4 are rods 11 adapted to move the valve gear to open and close the valves. Said gear, or valve-stem lifters, each consist of a rocking post or lever 12 having arms 13 and 14 the former arranged in the path of suitable tappets on rod 11 and the other adapted to alternately strike upper and lower tappets on a valve stem.

The rocking post or lever 12 is pivoted to a bracket 15 and is weighted at its upper end.

16 denotes a table pressed against the foot of lever 12 by a spring. Said foot is provided with two inclined bearing surfaces one of which is held in contact with the movable spring-supported table except when the lever or post 12 is turning on its pivot, said table however being always held against the foot of the post. The lever or post 12 is moved by the tappets on rod 11 about its pivots to alternately raise and lower a valve stem. The weight insures a positive and rapid movement of lever 12 and consequently of the valve stem and valves toward the close of the movement of the cylinder pistons at the time the tappets on rod 11 move it about its pivot and immediately after it has passed the vertical plane. The spring co-operates with the tappets and momentarily with the weight until the outer end of the inclined part of the lever approaches a bearing on the table whereupon it resists the weight and obviates jarring, this operation being due to the fact that the heel of the lever foot is at one side of the center of motion of the lever.

18 denotes an inlet and 17 a waste pipe.

19 is an outlet pipe to be connected with a house water-distributing system or the like.

The several cylinders each communicate at either end with a chamber said chambers being separated by partitions 20. These several chambers communicate respectively with the valve chests by ports 22 and 23, the transverse conduit 21 and vertical conduits 24. The middle ports 23 have each a caged annular valve 25, automatically opened by pressure in conduit 21 and closed by excess of pressure in the adjacent or middle cylinder.

The movable parts of the pump are represented in the position assumed when the upper valves in the valve cylinders 5 and 6 are open and the lower ones closed and the upper valve in cylinder 7 closed and the lower one open and water is entering inlet 18. The water entering under pressure follows the course of the feathered arrows through the conduits and ports into the several main cylinders and below their pistons which are being pushed up together with the valve operating rods 11. The valves in the cylinders have at such time the positions previously

given them by the action of the tappets on the rods 11 during their descent. The subsequent ascent of the pistons and of rods 11 at will a suitable time move the valve-operating levers to the positions indicated by dotted lines preparatory to the admission of water above the pistons. The tappets operate to tilt the weighted levers until the weight passes the center of support whereupon the movement is completed by gravity and the fall of the weighted arm is cushioned by the spring as above stated. During the descent of the pistons, represented as completed, the water below those in the right and left hand cylinders was forced through conduits in the base indicated by dotted lines and as indicated by the unfeathered arrows to the open valved passage communicating with waste outlet 17. At the same time the piston in the middle cylinder forced water through passage 24' indicated by dotted lines in Fig. 11 (see Fig. 6) to the valved passage communicating with outlet 19 connected to the distributing system. During the ascent of the pistons a like operation occurs whereby water is lifted in the cylinders and a part of it wasted at 17 and a part forced down through the conduit to the outlet 19.

Having thus fully described my invention, what I claim is—

1. In a pump and in combination the three main cylinders having the heads in common and each provided with a piston and with a valve cylinder, said cylinder containing two valve seats and valves therefor, and conduits 24 whereby the valve cylinders communicate with the heads, each cylinder head having a conduit 21 with ports 22 and valved port 23, the partitions 20 in the heads, the valve cylinder inlet 18, the outlets 17 and 19, and valve operating mechanism, substantially as set forth.

2. In a pump and in combination the three main cylinders having the heads in common and each provided with a piston and with a valve cylinder, said cylinder containing two valve seats and valves therefor, and conduits 24 whereby the valve cylinders communicate with the heads, each cylinder head having a conduit 21 with ports 22 and valved port 23, the partitions 20 in the heads, the valve cylinder inlet 18, the outlets 17 and 19, and valve mechanism, said mechanism comprising a pivoted and weighted lever provided with arms arranged respectively in the path of

parts attached to the piston rod head and in the path of parts attached to the valve stems, substantially as set forth.

3. In a pump the combination of a cylinder piston and a piston rod, a valve and a valve stem, an armed, pivoted, valve-operating weighted lever, said lever having at its end two converging inclined planes, tappets or the like for moving the lever about its pivot, and a movable spring-supported table adapted to bear against said planes and successively on opposite sides of a vertical plane passing centrally through the pivot whereby the spring may first cooperate with the weight to move the lever faster than the tappets and then resist the weight to obviate jarring, substantially as set forth.

4. The pump comprising the main cylinders arranged in series and communicating through suitable ports and conduits, the pistons connected by cross head 4, the valve cylinders, one for each main cylinder, with suitable valves, the valve-operating rods 11 connected to the cross head, the weighted rocking levers 12, said rods and levers of the two end cylinders being situated on one side of the pump and those pertaining to the middle cylinder on the other side, and said two valve cylinders having respectively inlet 18 and outlet 17 and the middle valve cylinder having outlet 19, substantially as set forth.

5. In a pump the three main cylinders each provided with a piston and having conduits 24 connecting them to heads common to said cylinders and each having a valve cylinder and valve operating mechanism, said cylinder heads having each a conduit 11 communicating with conduits 24 and also having partitions 20, ports 22 and a port 23, the latter being provided with an automatically operated valve, and suitable inlets and outlets for the valve cylinders whereby water can enter a valve cylinder and flow alternately to the opposite heads and be constantly discharged from the other valve cylinders, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK MIS.

Witnesses:

CHARLES B. PAVLICEK,
HATTIE M. PAVLICEK.