

A. A. PARKER.  
PUMP.

APPLICATION FILED OCT. 14, 1909.

957,794.

Patented May 10, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

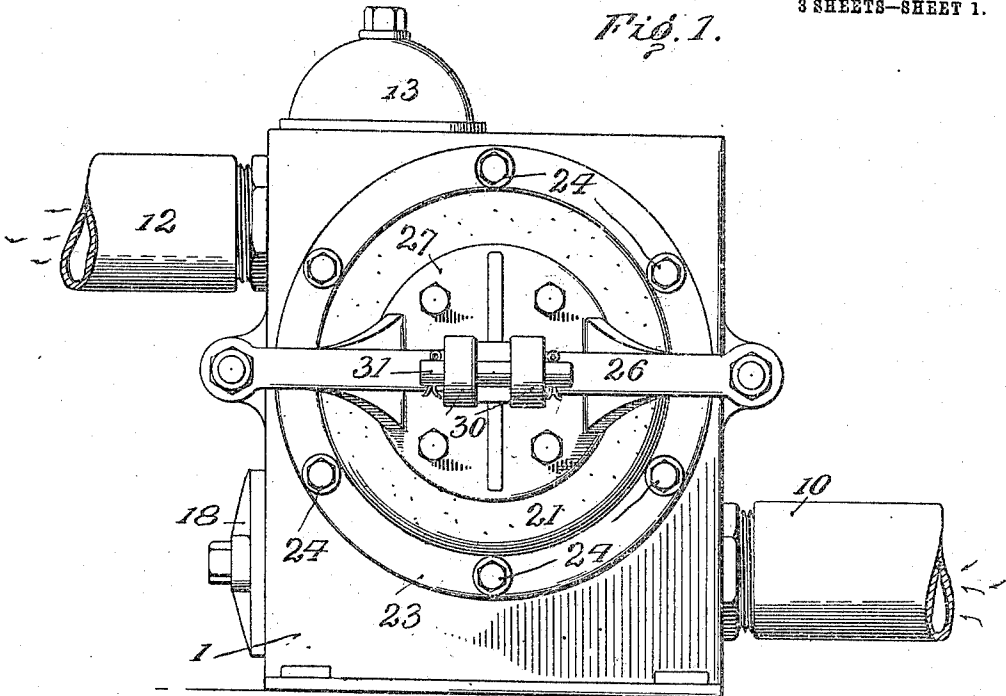
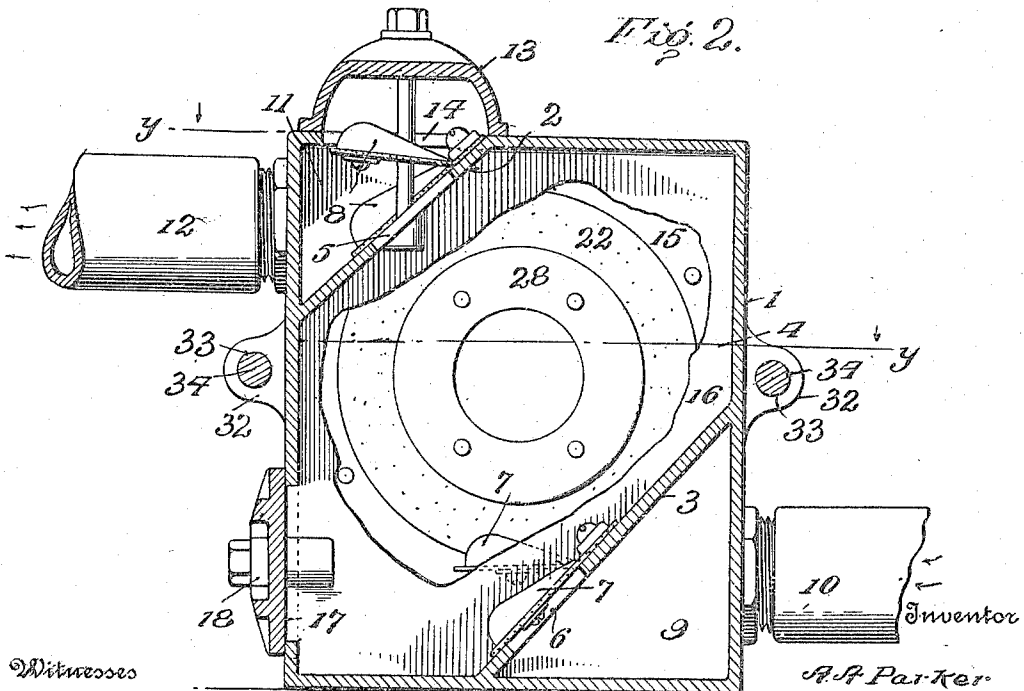


Fig. 2.



Witnesses

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334

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3 SHEETS—SHEET 2.

Fig. 3.

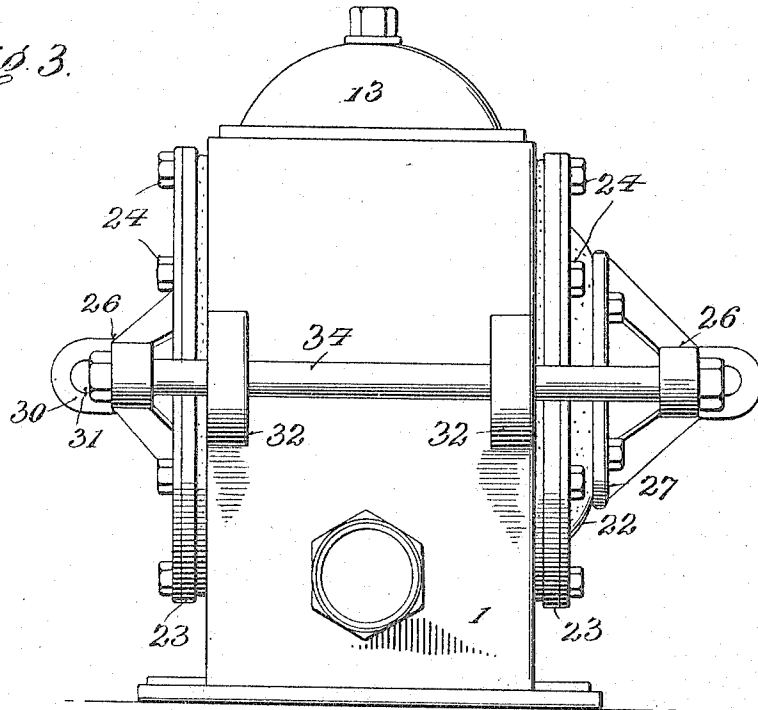
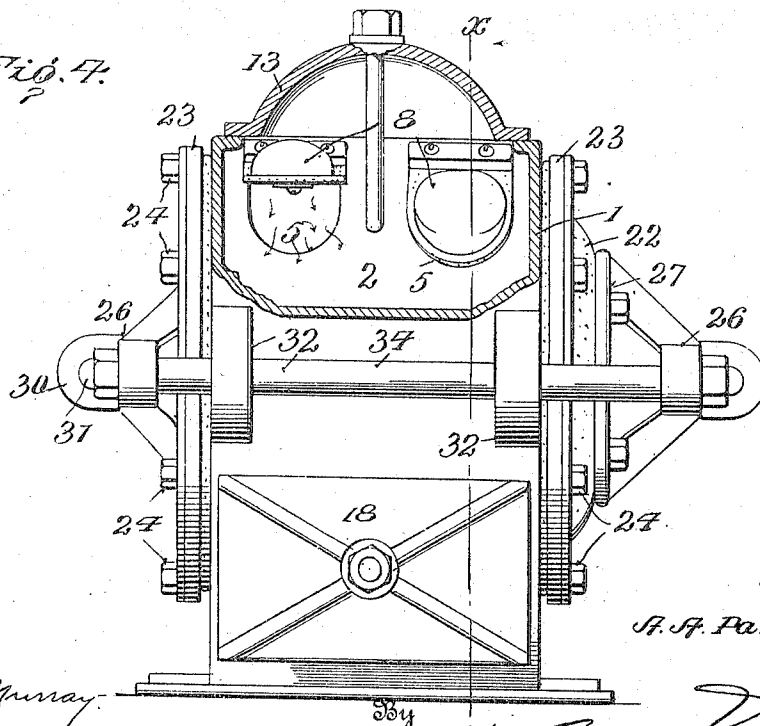


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

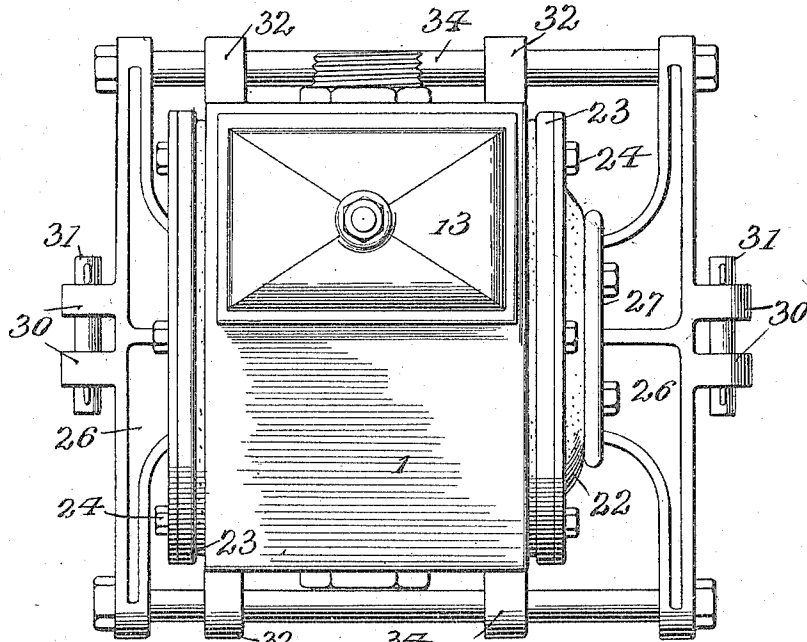
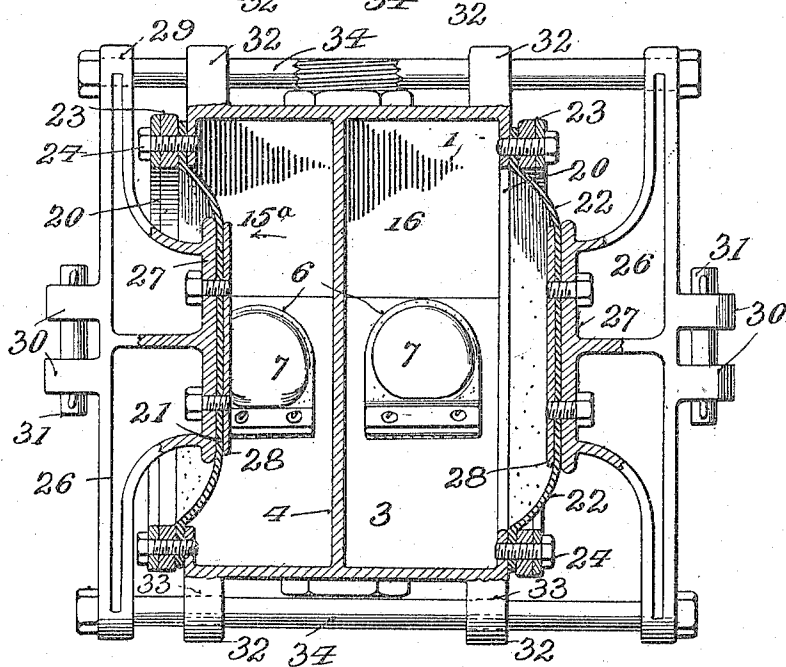


Fig. 6.



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# UNITED STATES PATENT OFFICE.

ATWELL A. PARKER, OF WATERFORD, NEW YORK.

## PUMP.

957,794.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed October 14, 1909. Serial No. 522,656.

*To all whom it may concern:*

Be it known that I, ATWELL A. PARKER, a citizen of the United States, residing at Waterford, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to improvements in double acting pumps, of the type using diaphragms as the medium for creating the suction and pressure. In my experience I have found that with pumps of this type, considerable difficulty exists, in that by the location of the parts, the sediment in the water prevented the proper seating of the valves, hence the apparatus failed to perform the work required of it.

Another disadvantage of the prior constructions known to me, resides in the fact that the diaphragms have not been so constructed and arranged as to be positively operated together, to obtain the full stroke and thereby take in and expel the full volume of water at each reciprocation of the parts.

According to my present invention, I provide means for overcoming the above noted difficulties, in that I arrange the inlet and outlet valves at an angle, to shed the sediment, and couple the diaphragms to horizontally reciprocating cross heads, causing them to be positively and simultaneously moved in a definite path, and at the same time insure the exact reciprocal movement of the diaphragms.

Therefore the object of my invention, is to provide specific details of construction, arranged whereby the desired result is obtained all of which will be hereinafter fully described and particularly pointed out in the claims.

In the drawings:—Figure 1 is an end view of my improved pump. Fig. 2 is a longitudinal section of the same on the line  $x-x$  Fig. 4, the central vertical partition being broken away to illustrate the diaphragm on the opposite end of the casing. Fig. 3 is a rear elevation of the same. Fig. 4 is a front elevation, the upper part of the casing being broken away to illustrate the outlet valves. Fig. 5 is a plan view. Fig. 6 is a horizontal section approximately on the line  $y-y$ —Fig. 2.

The same numerals refer to like parts in all the figures.

1 indicates a casing, provided with two transversely arranged inclined partitions 2 and 3, and a central vertical partition 4, disposed between the two partitions 2 and 3. The inclined transverse partitions are provided each with two openings 5—5 and 6—6, disposed each side the plane of the central vertical partition 4. Each inlet opening 6 is provided with an inwardly opening weighted flap valve 7, and the outlet openings 5, are likewise provided with similar valves 8, opening in the same direction. The partition 3, and the lower part of the casing, forms an inlet chamber 9, formed with an opening with which communicates an inlet pipe 10. An outlet chamber 11, is formed by the partition 2, and the upper part of the casing, and it is provided with an outlet opening, with which communicates an exit pipe 12. Access may be had to the chamber 11, by means of a removable cap 13, covering an opening 14 in the top of the casing. The vertical partition 4 forms in the casing two receiving chambers 15 and 16, accessible through an opening 17, covered by a cap 18. The openings 14 and 17, permit of the attendant getting to the valves 7 and 8, with little or no inconvenience.

The opposite ends of the casing 1, are formed with openings 20, through which operate the diaphragms 21 and 22. Each diaphragm is clamped to the casing by a ring 23, secured in place by fastenings, such as bolts or the like indicated at 24. The diaphragms are of the usual type, and are of such proportions as will give the desired suction to force the water in or out the various chambers. To each diaphragm is connected a cross head 26, having a centrally disposed plate 27, which fits against the outer face of the diaphragm, and on the inside of the latter is a plate 28, to which is bolted a plate 27, to fasten the cross head to the diaphragm. The outer ends of the cross head are formed with openings 29, and at about the center are ears 30, with a connecting pin 31. On the front and rear of the casing are ears 32, provided with openings 33, forming bearings for a pair of connecting rods 34, the opposite ends of the latter, passing through the openings 29, in the cross heads and secured thereto by nuts.

In operation, any suitable power is applied to the connecting pin 31 and the cross

heads 26 through the connecting rods 34 simultaneously reciprocated, hence the diaphragms are likewise reciprocated.

Assuming the cross heads are about at the limit of their movement toward the right hand side of the casing, as shown in the drawings, and the valve 7 in receiving chamber 16 is closed, valve 7 in receiving chamber 15 is open, valve 8 on the left hand end of chamber 11, is open and valve 8, on the right hand end of said chamber is closed. Immediately however, the cross head commences to reverse, or move toward the left, the operation and position of the valves will change. Assuming now the cross heads are moving toward the left in direction of the arrow *a* Fig. 6 the pressure created by the diaphragm 22, will close the inlet valve 7 in the receiving chamber 16, and thereby shut off the water in chamber 9, and will open the right hand valve 8, and force the water in receiving chamber 15 into the outlet chamber 11, from whence it passes through pipe 12. Simultaneously with this action, diaphragm 21, in moving in direction of the arrow creates a suction in receiving chamber 15 which opens valve 7 therein, and draws the water into said chamber from chamber 9, the suction however closes the left hand valve 8, in chamber 11, and thereby the water now being sucked from chamber 9 is contained in receiving chamber 15. As the reciprocating motion of the two cross heads is continued, the water from chamber 9, is alternately drawn, first into receiving chamber 16 and then into receiving chamber 15 from whence it is alternately forced outwardly through the openings 5 to chamber 11, thus producing a continuous supply.

By constructing the parts as described, the mud, sand, gravel and other sediment usually present in water, cannot accumulate on the valve seats, as in each instance the latter are arranged at an incline so that if such sediment does not fall of its own weight it will be washed away by the passage of the water. The heavier particles of the sediment will be caught in the bottoms of the various chambers from which points it can be quickly and conveniently removed. By arranging the valves to shed the sediment, liability of choking the pump is obviated, hence delays in operation are to a considerable extent reduced to a minimum.

Another advantage of the construction described, is in the fact the diaphragms are vertically disposed, thereby avoiding the cutting and wear of the sand, grit, etc., in the water lodging on them. Furthermore by mounting the diaphragms in the sides of the casing as set forth, it enables me to operate them in a horizontal direction which is a great convenience from a practical and economical standpoint.

The invention is extremely simple in con-

struction, and by reason of the few parts it is not liable to become out of order. The double acting effect of the diaphragm gives a constant supply.

Claims:—

1. In a double acting pump, the combination of a casing having two inclined partitions extending entirely across and connecting with the side walls of the casing and a centrally vertically disposed partition within the casing and connecting with the interior walls thereof and also connected with the two inclined partitions to provide two opposite receiving chambers, there being openings formed in the two inclined partitions to afford communication between the receiving chambers and inlet and outlet chambers formed by said inclined partitions and the corners of the casing adjacent thereto, a valve over each of the openings in the inclined partition to control the inlet and outlet of the water, a supply pipe communicating with the inlet chamber in the lower corner of the casing an outlet pipe communicating with the outlet chamber in the upper corner of the casing there being aligned diaphragm openings in the side walls of the casing opposite the vertical partition, a diaphragm in each said diaphragm opening, a cross head on each diaphragm and means for connecting the cross heads to cause them to be simultaneously operated.

2. In a double acting pump, the combination with a casing formed with inlet and outlet openings, and aligned diaphragm openings, the latter openings being in the side walls of the casing, two inclined partitions, one of said partitions extending across the casing below the upper corner thereof, the other said partition extending across the casing above the lower opposite corner thereof, forming with the walls of the casing, inlet and outlet chambers, a central vertical partition in the casing extending between and connected to the inclined partitions and forming with the latter receiving chambers, there being openings formed in the inclined partitions for affording communication between the receiving and inlet and outlet chambers, valves on the upper inclined surfaces of the partitions for controlling said openings, a diaphragm in each diaphragm opening, a cross head connected to each diaphragm and a pair of connecting rods connected at or near the ends of the cross heads at points beyond the ends of the casing to cause the diaphragms to operate simultaneously.

In testimony whereof I affix my signature in presence of two witnesses.

ATWELL A. PARKER.

Witnesses:

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