2 Sheets--Sheet 1.

A. J. TYLER.

Pumps.

No. 150,914. Patented May 12, 1874.

Fig 1

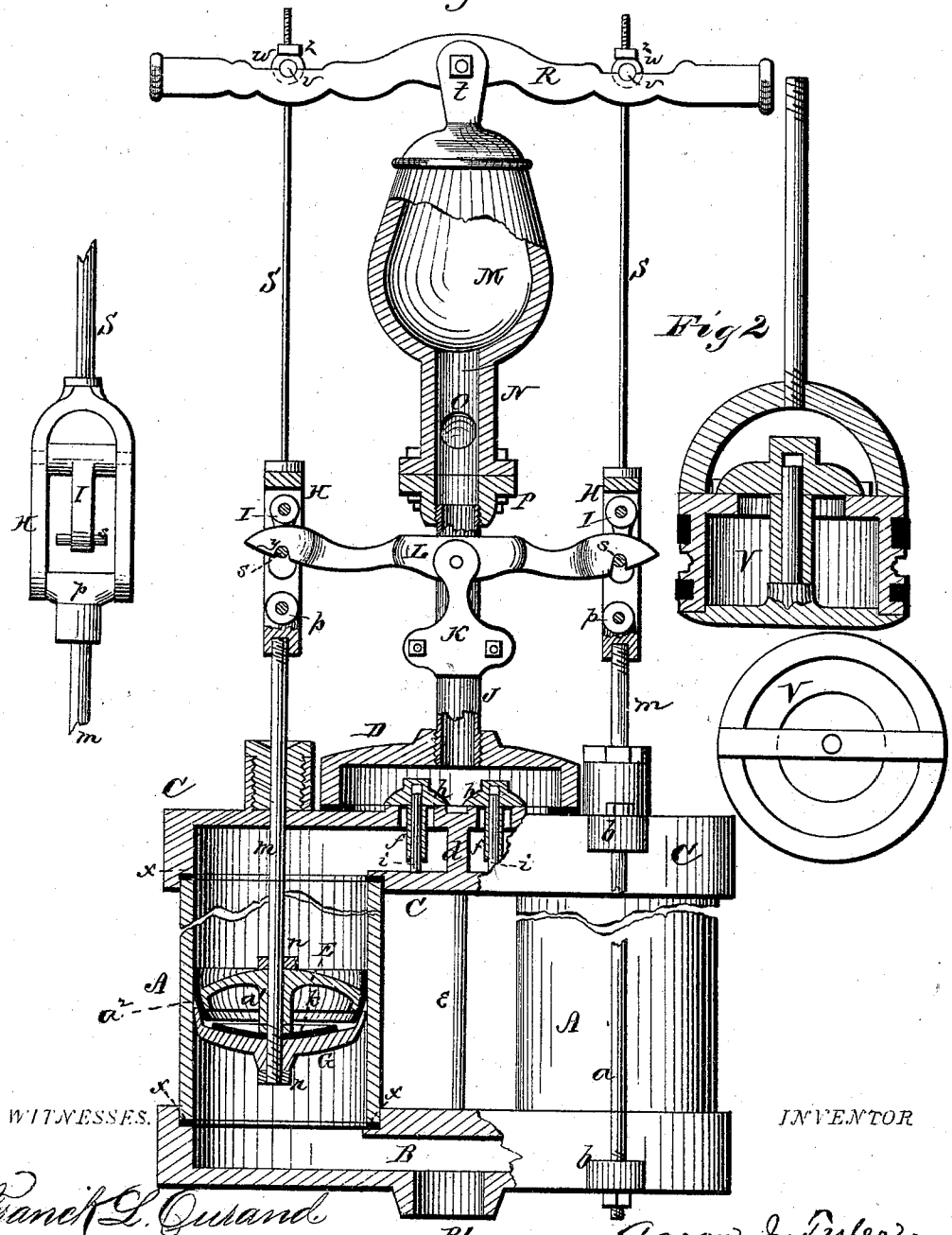

Fig 2

WITNESSES.

Franck L. Quand

C. L. Euerk.

By

INVENTOR

Aaron J. Tyler.

Alexander Mason

Attorneys.

2 Sheets--Sheet 2.

A. J. TYLER.

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Fig 3

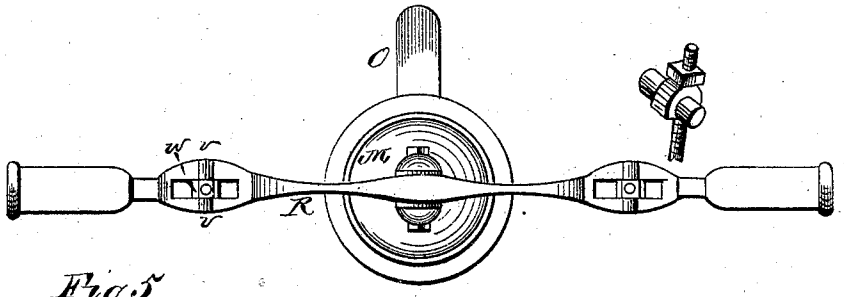


Fig 5

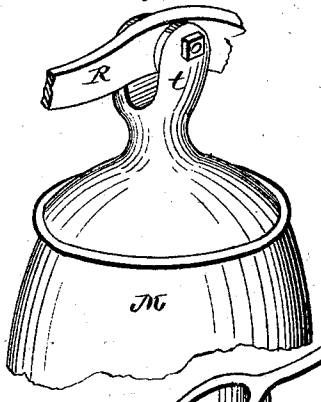


Fig 4

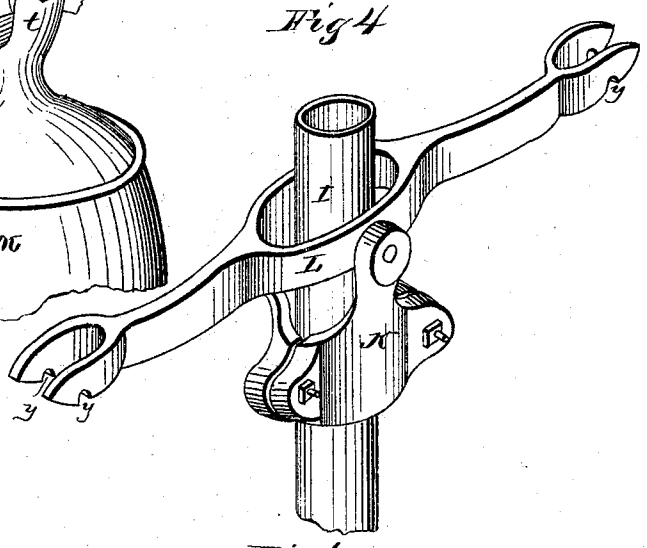
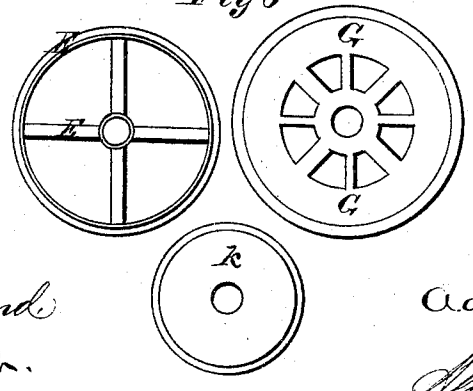


Fig 6



WITNESSES.

F. L. Durand

C. L. Ewerth.

INVENTOR

Aaron J. Tyler

By Alexander Bruce

Attorneys.

UNITED STATES PATENT OFFICE.

AARON J. TYLER, OF GENESEO, NEW YORK.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 150,914, dated May 12, 1874; application filed April 20, 1874.

To all whom it may concern:

Be it known that I, AARON J. TYLER, of Geneseo, in the county of Livingston and in the State of New York, 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 and to the letters of reference marked thereon making a part of this specification.

The nature of my invention consists in the construction and arrangement of a double-acting force-pump, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation, partly in section, of my pump. Fig. 2 is a vertical section of a modification of the plunger. Figs. 3, 4, 5, and 6 represent views of detached parts of the pump.

A A represent the two pump-cylinders, which are open at both ends, and fitted into a bottom chamber, B, and top chamber C, the whole being fastened together by means of rods *a a* passing through ears *b b* on the sides of the chambers. The ends of the cylinders A A fit against shoulders or offsetts *x x* in the chambers, and suitable packing is introduced between said shoulders and the ends of the cylinders. In the center of the bottom of the chamber B is the water-inlet B′. The water passing into the chamber B has a free and unobstructed passage into the cylinders, as they are left entirely open without any valves. In like manner the water has a free and unobstructed passage from the cylinders into the top chamber C. This chamber is divided transversely in the center by a vertical partition, *d*, on each side of which is a valve, *h*, opening into a valve-chamber, D, placed on top of the chamber C, and fastened, by means of rods *e*, to the bottom chamber B. Each valve is provided with a central downward-projecting stem, *f*, which is made hollow from the lower end upward for a suitable distance, and fits over a pin, *i*, cast in the bottom of the chamber C. By this means the valve will adjust itself to the seat; and if the valve or seat should wear by use the valve will nevertheless fit the seat tightly. On top of the valve is formed a shank or knob, as shown, for the purpose of hitching onto, to grind the valve down to the seat.

It will be noticed that the valves are located above the plungers, which is a decided advantage, as the water will be forced through the valves, instead of drawn through by suction.

The plungers are constructed of two parts, E and G. The under part, G, is perforated, and has a concave interior, and the rim thereof is beveled, as shown in Fig. 1. The upper part, E, is composed of a rim and a central sleeve, *a′*, connected by braces. The rim of this part is beveled just the reverse to the rim of the part G. The two parts are fastened together by the piston-rod *m* passing through their centers, and nuts *n n* screwed on the same above and below the plunger. Suitable elastic packing is introduced between the disk and rim where they come in contact with each other. On the rod *m*, between the parts E and G, is placed the valve *k*, which is simply an ordinary packing-disk allowing the water to pass upward through the plunger, but prevents its downward passage. By having the part G of the plunger concave, the packing-disk *k* will at all times perfectly fit the space therein and be prevented from crimping, and form a perfectly air-tight joint.

In plungers where the bottom part is made flat, instead of convex, as I have shown, the upward pressure thereof is oftentimes so great that its center will be drawn upward, and the plunger rendered useless. I avoid this defect by the formation of the part G of the plunger in the manner shown and described.

When the two parts of the plunger fit together, and the packing-ring a^2 is put between them, the packing is pressed outward at its upper edge by the rim of the part E, and held out perfectly smooth and tight in its place, pointing upward, and fitting the interior of the cylinder. The upper end of the piston-rod *m* is screwed into a short tube or nut, *p*, hung by trunnions or journals in the lower end of a stirrup, H. In this stirrup is hinged or pivoted a T-shaped arm, I, through the lower end of which is passed a pin, *s*. J represents a pipe screwed into the top of the valve-cham-

ber D, and through which the water is forced by the plungers. On this pipe, at a suitable point, is fastened a clamp, K, provided with upward-projecting ears, to which is pivoted the walking-beam L. The beam L is enlarged in the center, and slotted longitudinally to straddle the pipe J, one side of the beam being pivoted to each ear of the clamp K. The ends of the beam L are slotted or forked to straddle the ends of the arms I, and the pins *s* in said arms enter notches *y* in the under sides of the forked ends of the beam, as shown in Fig. 1. M represents the usual air-chamber for pumps of this character, provided with the short pipe N at its lower end, and with outlet-pipe O. The air-chamber is secured on the pipe J by means of a chuck, P, bolted onto the air-chamber, and screwed on the upper end of the pipe. This makes it more convenient to cut the thread. The bolts that fasten the chuck to the air-chamber are also intended to hold wrought-iron braces, which screw down onto the platform that the pump rests on; but these braces I have not represented in the drawing. On the top of the air-chamber M is formed a fork, *t*, in which is pivoted the handle R. At a suitable distance on each side of the pivot the handle R is slotted vertically, and in each slot is placed a block, *w*, provided with trunnions *v v* resting in notches or bearings formed on the upper side of the handle, one on each side of the slot. Through the block *w* passes a rod, S, the lower end of which is screwed into the upper end of the stirrup H, and on the upper end of the rod is screwed a nut, *z*, for fastening or holding the rod. By the arrangement of the rocking blocks *w*, it gives more perfect tension-rods, and admits of the use of much smaller rods.

When this pump is used for engine purposes the walking-beam L and the handle R are dispensed with.

In place of the plunger E G with leather valve *k*, I may, in some cases, use the plunger V, (shown in Fig. 2,) which is simply a suitable case or shell with exterior packing, and a metallic valve constructed in the same manner as the valves *k* in the valve-chamber D.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a force-pump, the valve-chamber D, arranged in relation to the cylinder or cylinders, as described, and provided with one or more valves, and communicating with one or more chambers, C, thereunder, and the valveless chamber B, in combination with one or more open-ended cylinders, A, provided with one or more pistons working therein, all substantially as and for the purposes herein set forth.

2. The plunger, consisting of the concavo-convex part G, with beveled rim and interior valve *k*, the part E, with beveled rim and sleeve a^1, and the interposed packing a^2, all united together and to the piston-rod, substantially as herein set forth.

3. The combination of the walking-beam L, clamp K, pipe J, swinging bars I, with pins *s*, and stirrups H, all substantially as and for the purposes herein set forth.

4. The rocking block *w*, with trunnions *v*, in combination with the handle R and rods *s*, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of March, 1874.

AARON J. TYLER.

Witnesses:
C. L. EVERT,
HIRAM TYLER.