J. G. WOLF.

Double-Acting Pump.

No. 206,655. Patented July 30, 1878.

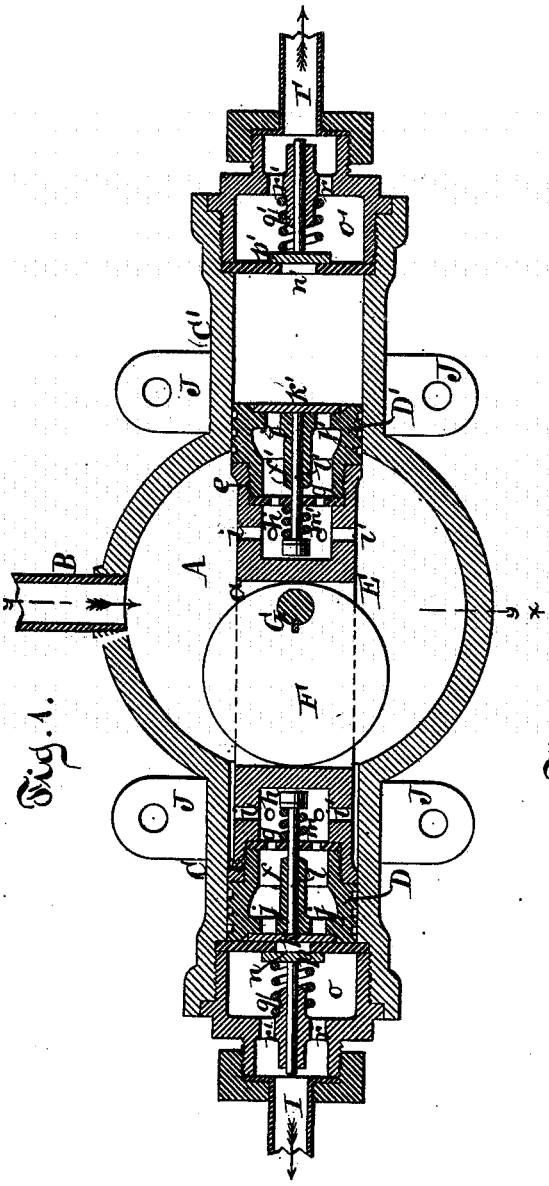

Fig. 1.

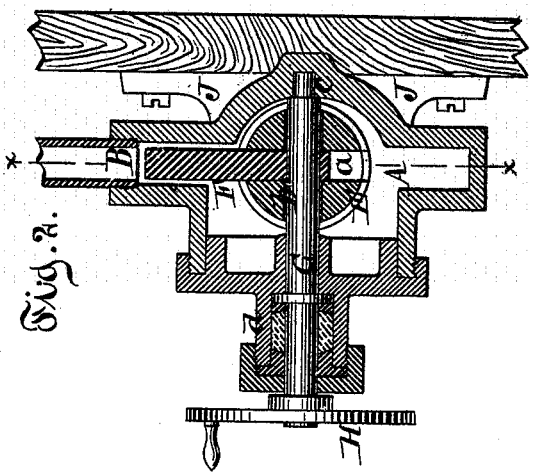

Fig. 2.

Witnesses

Chas. Wahlers.

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# UNITED STATES PATENT OFFICE.

JOHN G. WOLF, OF NEW YORK, N. Y.

## IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. **206,655**, dated July 30, 1878; application filed June 8, 1878.

*To all whom it may concern:*

Be it known that I, JOHN G. WOLF, of the city, county, and State of New York, have invented a new and useful Improvement in Double-Acting Pumps, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a longitudinal vertical section in the plane *x x*, Fig. 2. Fig. 2 is a transverse vertical section in the plane *y y*, Fig. 1.

Similar letters indicate corresponding parts.

This invention consists in the combination, in a pump, of a suction-chamber, two cylinders radiating from said suction-chamber in opposite directions, two pistons, one for each cylinder, a rod or bar extending through the suction-chamber and forming a rigid connection between the two pistons, suitable chambers formed in the ends of this bar and communicating with the suction-chamber and with the interior of the pistons, a shaft which extends transversely through a slot formed in this rod or bar, an eccentric mounted on this shaft and acting directly on the bar connecting the two pistons, suitable valves applied to the pistons and cylinders, and discharge-pipes extending from the outer ends of said cylinders, thereby producing a pump which can be readily operated by hand, and which can be used with great advantage, particularly for pumping air or other gaseous bodies.

In the example shown in the drawing, the letter A designates the suction-chamber of my pump, from which extends the suction-pipe B. Said suction-chamber is, by preference, made circular; but it can be made in any other suitable form or shape, and it communicates freely with two cylinders, C C′, which radiate therefrom in opposite directions, as shown in Fig. 1. Into these cylinders are fitted the pistons D D′, which are firmly connected by a rod or bar, E, extending through the suction-chamber A. The bar E is provided with two slots, *a b*, extending crosswise to each other, as shown in Fig. 2, and into the slot *a* is placed a circular disk, F, which is mounted eccentrically on a shaft, G, and which bears snugly against the ends of said slot. The shaft G extends through the slot *b* in the bar E, and it has its bearing at one end in a socket, *e*, formed in the suction-chamber A, Fig. 2, while its other end extends through a stuffing-box, *d*, and bears a hand-wheel, H. The pistons D D′ are connected to the opposite ends of the bar E by means of screw-threads *e*, and in each piston is formed a chamber, *f* or *f′*, which communicates through a perforated plate, *g* or *g′*, with a chamber, *h* or *h′*, formed in the corresponding end of the bar E. The chambers *h h′* in the bar E communicate by openings *j j′* with the cylinders C C′. The openings *j j′* are covered by valves *k k′*, which are mounted on stems *l l′* and exposed to the action of springs *m m′*, that have a tendency to keep the same closed. The outer ends of the cylinders C C′ communicate through apertures *n n′* with chambers *o o′*, containing valves *p p′*, which are depressed upon said apertures by springs *q q′*. The valve-chambers *o o′* communicate through openings *r r′* with the discharge-pipes I I′.

Suitable brackets J serve to secure my pump to a vertical wall or board in the position shown in Fig. 2.

When the shaft G is turned from the position shown in Fig. 1 the piston D′ is moved outward, while the piston D moves inward. The liquid or fluid contained in the cylinder C′ is forced out through the pipe I′, and at the same time a partial vacuum is produced in the suction-chamber A, so as to cause a fresh supply of liquid or fluid to enter through the suction-pipe and to pass through the valve *k* into the cylinder C. When the shaft G has completed one-half of a revolution the motion of the pistons is reversed, the liquid or fluid contained in the cylinder C is forced out, and the cylinder C′ receives a fresh supply.

The principal advantage of my pump is due to the great simplicity of its construction and to the ease with which it can be operated, and I have designed the same particularly for the purpose of producing a circulation of dithionous acid through a refrigerator where it is desirable to have a pump which can be readily operated by hand, and which does not allow any escape of gas.

In my pump the stuffing-box *d*, which is the only place where an escape of gas might be

possible, communicates with the suction-chamber A, in which, during the operation of the pump, the pressure is below that of the external atmospheric air, so that even if the stuffing-box should become leaky the atmospheric air would have a tendency to enter, but no gas would escape.

It must be remarked, however, that the pistons, instead of being made hollow, may be made solid, and each cylinder provided with a separate suction and discharge pipe extending from its outer end, the chamber A being used solely for the purpose of protecting the eccentric and for supporting the shaft on which the same is mounted.

I am aware that pumps have been constructed with a suction-chamber and three cylinders radiating from the same, each cylinder containing a plunger, which is connected, by a suitable rod, with an eccentric situated in the interior of the suction-chamber. Such pumps, however, are complicated, and in many respects different from my pump.

What I claim as new, and desire to secure by Letters Patent, is—

The combination, in a pump, of a suction-chamber, two cylinders radiating from said suction-chamber in opposite directions, two pistons, one for each cylinder, a rod or bar extending through the suction-chamber and forming a rigid connection between the two pistons, suitable chambers formed in the ends of this bar and communicating with the suction-chamber and with the interior of the pistons, a shaft which extends into the suction-chamber, an eccentric mounted on this shaft and acting directly on the bar connecting the two pistons, suitable valves applied to the pistons and cylinders, and discharge pipes or channels extending from the outer ends of said cylinders, all constructed and adapted to operate substantially as shown and described.

In testimony whereof I have hereunto set my hand and seal this 31st day of May, 1878.

JOHN GEO. WOLF. [L. S.]

Witnesses:
W. HAUFF,
CHAS. WAHLERS.