C. B. & J. Hardick,

Pump Valve,

No. 51,653, Patented Dec. 19, 1865.

Fig. 1

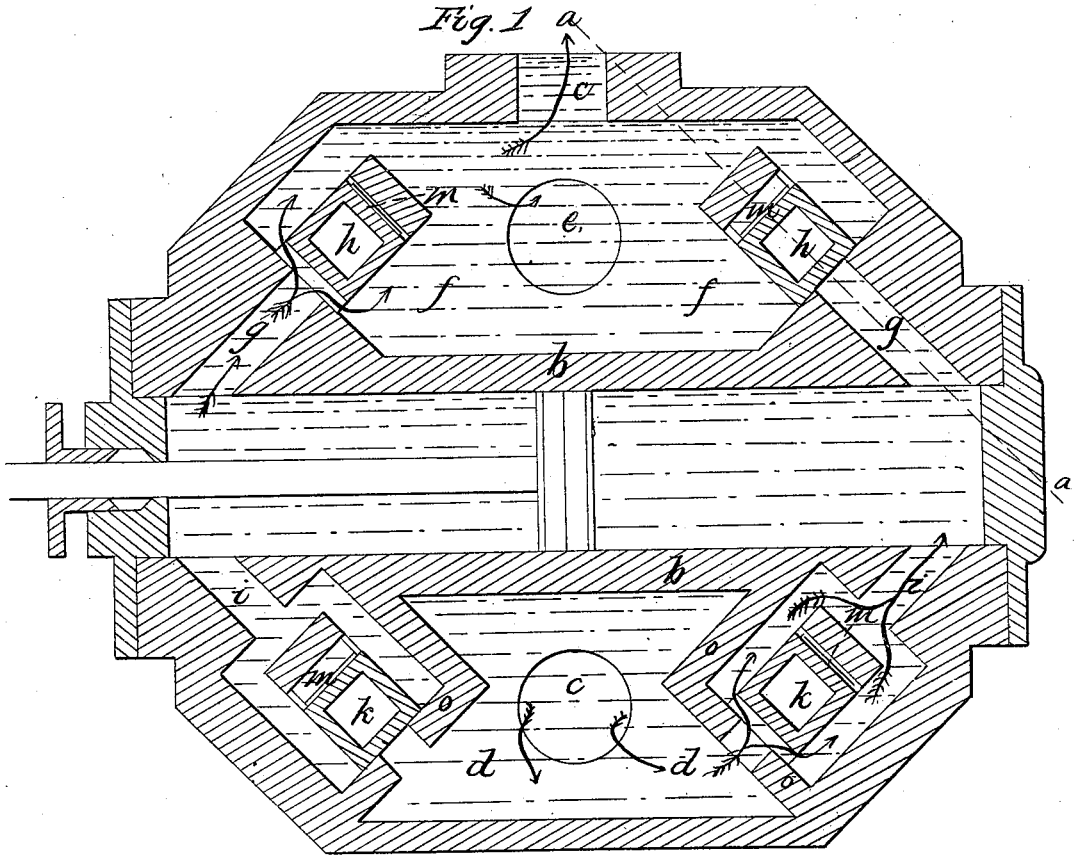
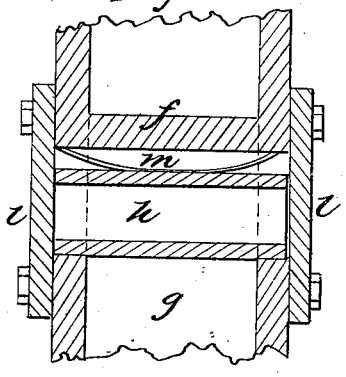


Fig. 2



Witnesses:

Chas. A. Smith

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UNITED STATES PATENT OFFICE.

CHAS. B. HARDICK AND JOHN HARDICK, OF BROOKLYN, NEW YORK, ASSIGNORS TO THEMSELVES AND ALBERT B. CAMPBELL, OF SAME PLACE.

IMPROVEMENT IN PUMP-VALVES.

Specification forming part of Letters Patent No. **51,653**, dated December 19, 1865.

To all whom it may concern:

Be it known that we, CHARLES B. HARDICK and JOHN HARDICK, of Brooklyn, in the county of Kings and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Valves for Pumps; and we do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a longitudinal section of a pump fitted with our improved valves, and Fig. 2 is a transverse section through the valve-chest and valve at the line *a a*.

Similar letters denote the same parts.

Cylindrical and polygonal valves have heretofore been constructed and fitted into a valve-chest, so as to be accessible without taking the chest apart, as seen in Letters Patent granted to us August 18, 1863.

The nature of our present invention consists in combining with a polygonal valve a spring acting to close the valve on its seat, thereby avoiding the concussion consequent on allowing the motion of the water to close the valve with a sudden blow, and also saving the amount of water that is always lost by escaping through the seat during the time the valve is closing by the action of the water.

We also arrange our valves in a peculiar manner relatively to the pump-cylinder, so that the passage-ways are free for the water to pass on each side of the polygonal valves with as little obstruction as possible.

In the drawings, *b* represents the pump-cylinder, which is to be fitted with piston and heads in any usual manner.

c is the induction-pipe to the valve-chest *d*, and *e* is the eduction-pipe from the valve-chest *f*.

i i are the induction-ports; *k k*, the induction-valves. *g g* are the eduction-ports, and *h h* the eduction-valves.

Each of the valves *k k h h* is formed polygonal. We prefer that they be formed square and hollow, as shown.

The respective valve-chests *d f* are formed with transverse openings, one for each valve, which openings pass entirely through the sides of the chest, and a cap is provided at each end of each valve, as seen at *l*, with a packing, making a tight joint with the sides of the valve-chest. This enables us to cast the valve-chests in one piece with the cylinders and finish up the seats for the respective valves at the ends of the ports by simply filing or planing out the valve-chest at this point.

The separate movable caps *l* enable us to remove, clean, grind in, or repair any one of the valves that may not work well without interfering with the other ones.

Each valve is provided with a spring, *m*, the ends of which sit within and are retained by the openings through the sides of the valve-chest, and said springs bear against the opposite side of the valve to the seat, and the spring, if formed as a half-ellipse, may press against the middle of the valve, as shown in Fig. 2; but if the spring is turned over, the ends will press upon the valve and the center against the cross-bar at *n*.

We do not limit ourselves as to the character or shape of the spring, and also remark that the cross-bar *n* might be dispensed with when the spring is introduced, as seen in Fig. 2, as the spring itself takes a bearing upon the upper surface of the valve as the valve rises, preventing concussion at the ends.

The passage-ways for the water and seats for the valves are arranged, as represented, in a diagonal position, and the induction-valves are each in a separate space, partitioned off at *o*, so that they close downward, although below the cylinder. In all cases the water has free opportunity to pass around the valve in both directions in either the induction or eduction chambers.

What we claim, and desire to secure by Letters Patent, is—

1. The polygonal valve guided at its ends by openings in the sides of the valve-chest, in combination with the spring or springs applied to close said valve, in the manner and for the purposes set forth.

2. The arrangement of the induction and eduction passages, the latter being fitted with the division *o*, in combination with polygonal valves, arranged as set forth.

In witness whereof we have hereunto set our signatures this 17th day of July, 1865.

CHARLES B. HARDICK.
JOHN HARDICK.

Witnesses:
CHAS. H. SMITH.
JAS. E. SERRELL, Jr.