H. Belfield,

Double-Acting Pump.

No. 27,945. Patented Apr. 17, 1860.

Fig. 1.

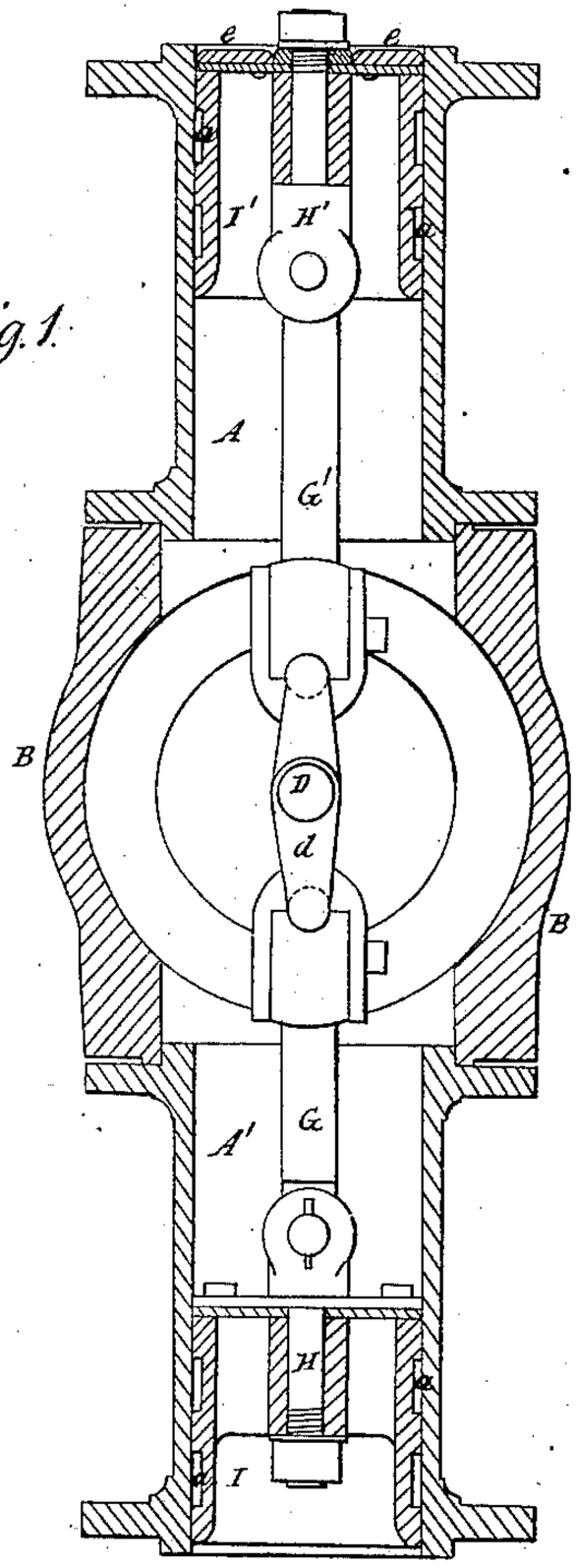


Fig. 2.

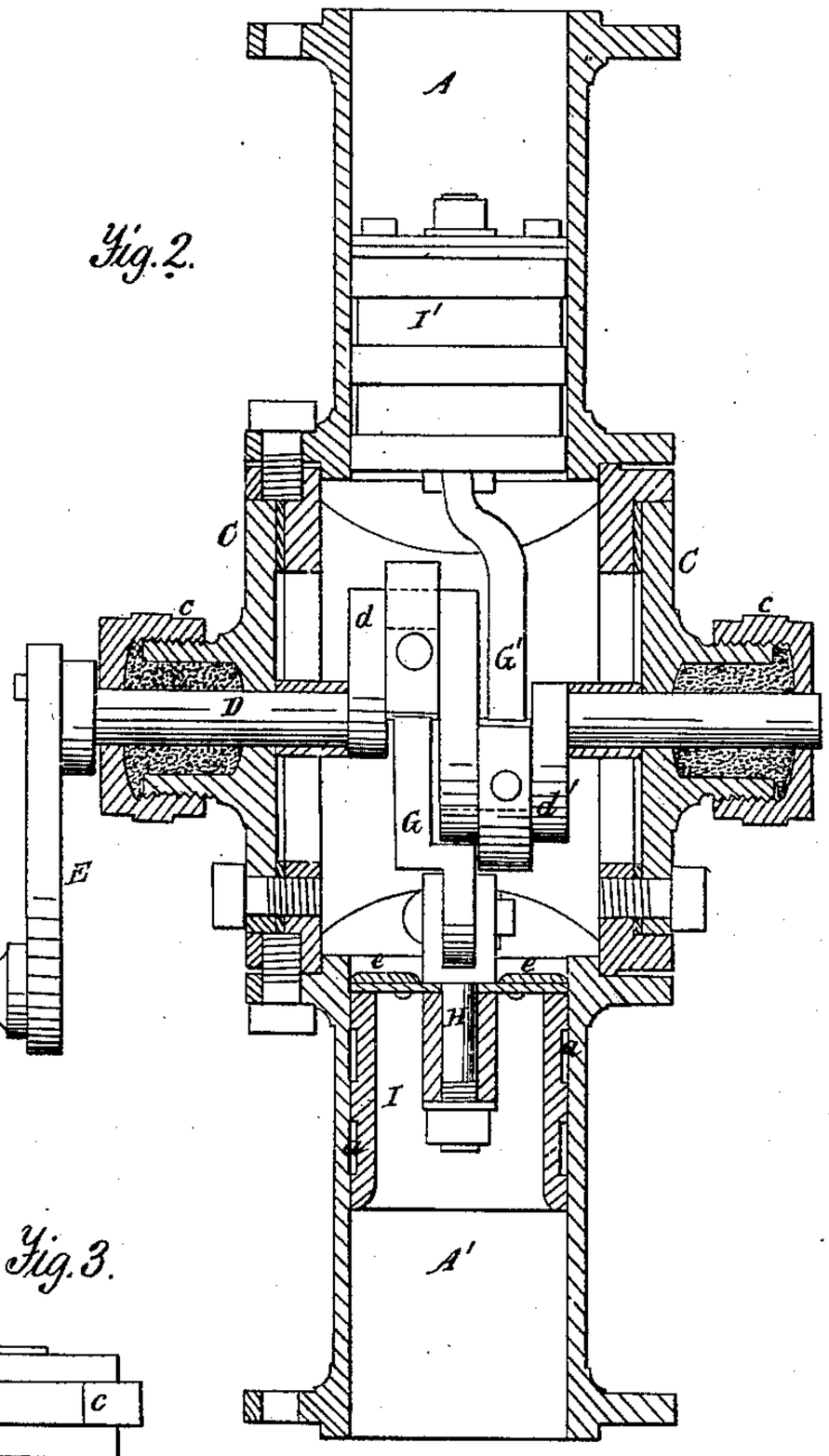
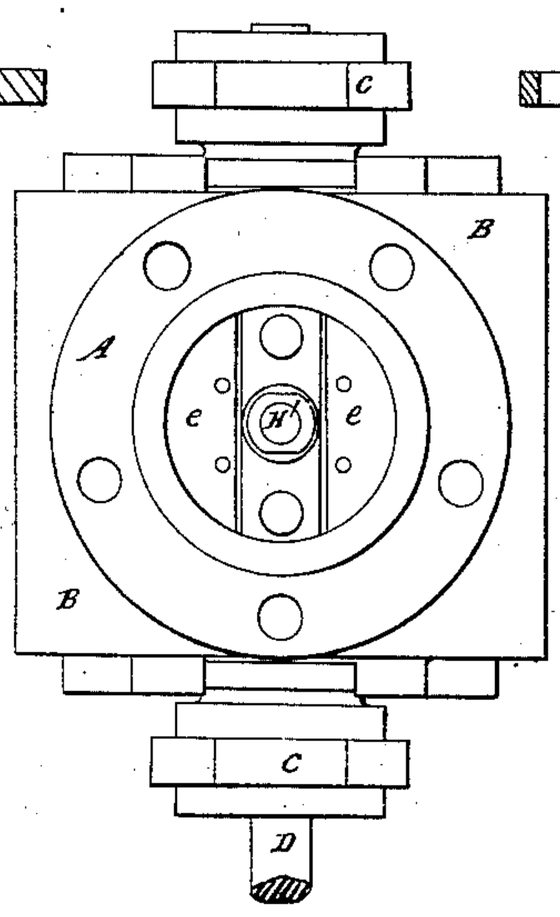


Fig. 3.



Witnesses.

Henry Howson

Horace See

Inventor.

Henry Belfield

UNITED STATES PATENT OFFICE.

HENRY BELFIELD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND SAMUEL W. HOFFMAN, OF SAME PLACE.

PUMP.

Specification of Letters Patent No. 27,945, dated April 17, 1860.

To all whom it may concern:

Be it known that I, HENRY BELFIELD, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention relates to an improvement in the pump for which letters patent were granted to W. H. Harrison on the 23d day of June 1857, said pump having two buckets reciprocating in contrary directions, and my improvement consists in the employment of a shaft with two cranks one connected by a rod to one bucket and the other by a similar rod to another bucket and the whole being constructed and arranged as set forth hereafter so that the desired motion may be imparted to the buckets by a rotating motion of the shaft instead of by vibrating levers, thereby rendering the pump more easy to operate by hand and better adapted for being driven directly from any adjacent shaft, or, from a steam engine or other prime mover, at the same time affording a direct passage for the flow of water through the pump and a regular and uniform discharge of water from the same.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawing which forms a part of this specification, Figure 1, is a vertical section of my improved pump. Fig. 2, a transverse vertical section, and Fig. 3, a ground plan.

Similar letters refer to similar parts throughout the several views.

A and A′ are the two barrels of the pump secured, the former to the upper end and the latter to the lower end of the casing B with which both barrels communicate. To each side of this casing is secured a tightly fitting cover C each cover being furnished with a stuffing box *c*.

The opposite ends of the double cranked shaft D pass through and turn in the opposite covers C and their stuffing box, one end of this crank shaft being furnished with a handle E or other suitable driving apparatus.

The crank shaft D has two cranks *d* and *d′*, the former being connected to one end of the rod G, the opposite end of which is jointed to the head of a bolt H which is secured to the bucket I. This bucket fits snugly, but so as to reciprocate freely in the barrel A′, is provided with grooves *a a* for receiving suitable packing, and is furnished with butterfly valves *e e*, opening outward, the said valves being composed of one piece of leather or other suitable material secured to the top of the piston or bucket I by the bolt H. The crank *d′* is connected to one end of the rod G′ the opposite end of which is jointed to a bolt H′, secured to the bucket I′ which is adapted to the barrel, this bucket being also furnished with butterfly valves opening outward, and constructed in the same manner as the valves of the bucket I. On turning the shaft D a simultaneous reciprocating motion will be imparted to the two buckets I and I′ which move in their respective barrels invariably in a contrary direction to each other. As the bucket I rises the water will rush into the barrel A′, at the same time a portion of the water within the chamber of the casing B is forced by this bucket through the descending bucket I′ (the valves of which will be open) into the barrel A above the bucket. When the bucket I descends its valves will be opened and the water which had previously found its way into the barrel A′ by the rising of the same bucket will pass through the latter into the chamber of the casing B, at the same time, the water which had passed through the bucket I during its downward movement and into the barrel A is forced from this barrel by the upward movement of the bucket and its closed valves.

It will now be seen without further description that by turning the shaft D a constant stream of water may be forced through any pipe or pipes communicating with the barrel A.

I am aware that pumps having two valved buckets moving in contrary directions have been heretofore known and used and also that two such buckets have been operated by devices situated in a chamber between and communicating with the two barrels of a pump, as in the patent granted to W. H. Harrison June 23, 1857. In all such cases however the operating of the buckets has been effected through the medium of vibrat-

ing bars and not by means of rotating cranks which not only afford a more easy and agreeable mode of moving the buckets by hand, but present facilities for driving directly from any adjacent rotating shaft or directly from a steam engine or other prime mover. Moreover, the motion imparted to the buckets by a revolving crank arrangement is more uniform than that obtained by vibrating levers, and consequently insures a greater uniformity in the discharge of the water.

Another advantage of this rotating double crank is the opportunity which it affords of arranging the barrels or cylinders in a line with each other, thus presenting a direct passage for the flow of water through the pump and avoiding the tortuous passages which are the most objectionable features in ordinary double acting pumps.

Without claiming broadly, therefore, the use of two buckets moving in contrary directions, or the operating of the same by devices situated between the two buckets: I claim as my invention and desire to secure by Letters Patent as an improvement in the aforesaid patent of W. H. Harrison:

The shaft D, its two cranks *d* and *d'* in combination with the rods G and G' and valved buckets I and I' and their barrels A and A' the whole of the parts being constructed and arranged as set forth so that a simultaneous reciprocating motion in contrary directions may be imparted to the said buckets by the rotation of the said shaft D, and so that the two barrels may be in a direct line with each other.

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

HENRY BELFIELD.

Witnesses:

HENRY HOWSON,

CHARLES D. FREEMAN.