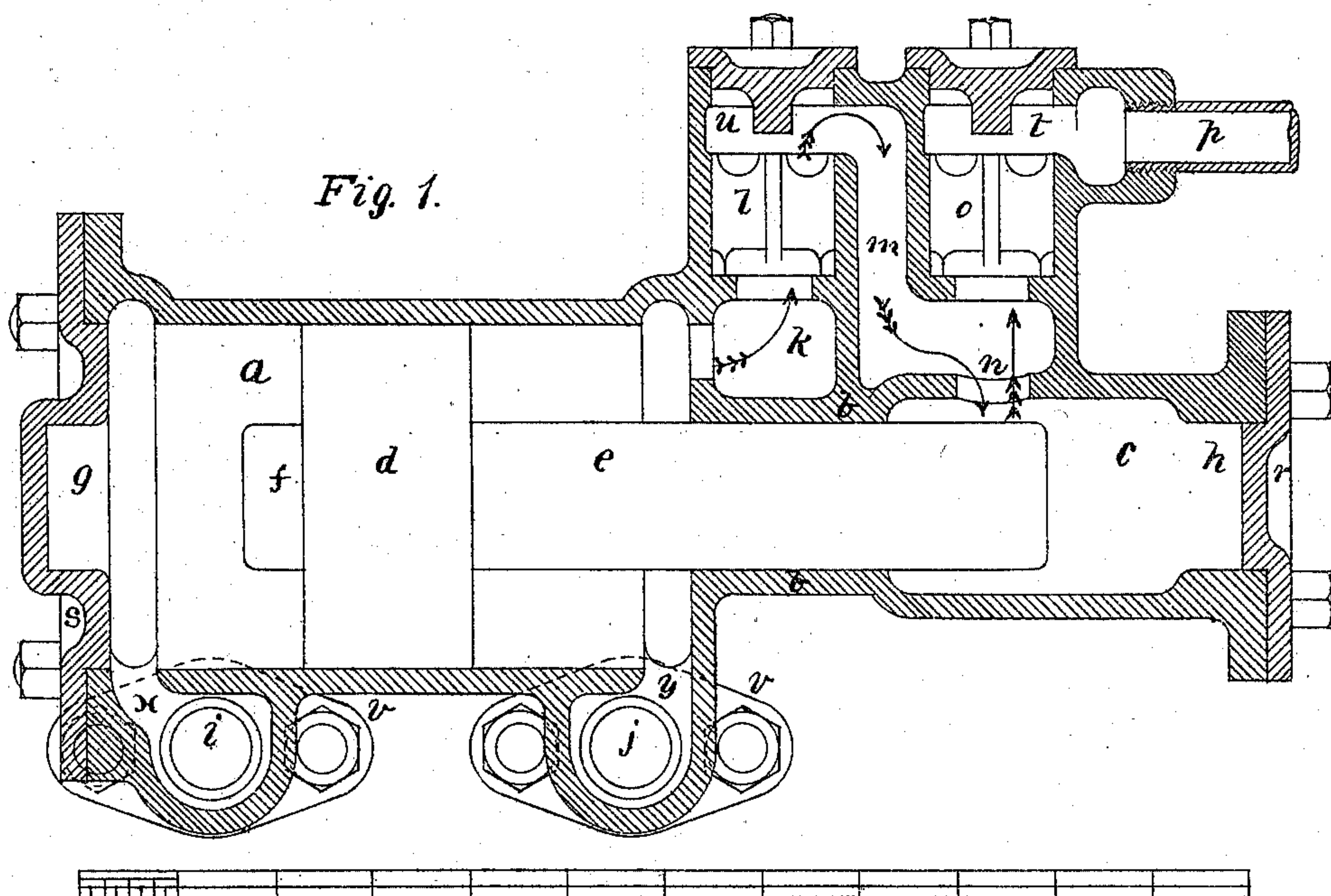
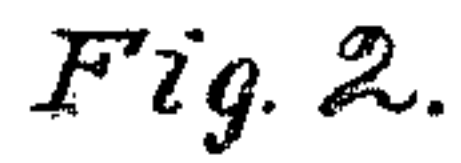


Improvement in Pumps.

Patented Nov. 14, 1871.



Inventor.

Great Holes
N. D. Phelps.

Norman W. Wheeler

UNITED STATES PATENT OFFICE.

NORMAN W. WHEELER, OF MORRISTOWN, NEW JERSEY.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 120,841, dated November 14, 1871.

To all whom it may concern:

Be it known that I, NORMAN W. WHEELER, of Morristown, in the county of Morris and State of New Jersey, have invented certain Improvements in Boiler-Feeding Devices, of which the following is a specification:

This invention consists essentially of a feed-pump, to be actuated by the play of plus and minus pressures to which liquid is subjected in a double or double-acting steam or other pump.

Figure 1 is a sectional elevation of a machine embodying my invention, and Fig. 2 is an end elevation of the same.

In the drawing forming a part of this specification, *a* is a barrel, and *d* a plunger fitting reasonably tight therein. *e* is a ram attached to and of less diameter than the plunger *d*, fitting reasonably tight in the barrel *b*, and working through the chamber *c*. *h* is a recess, so formed that when the end of *c* reaches and enters it a water-cushion will be formed to arrest the motion of *d* and *e*. The recess *g* and projection *f* upon the plunger *e* make a water-cushion for the arrest of the motion of *d* and *e* when moving toward the left. *i* and *j* are pipes connecting by the passages *x* and *y* with the ends of the barrel *a*. The pipes *i* and *j* are to be connected by means of the flanges *v v* to the two ends of the steam or other pump above the receiving-valves and below the delivery-valves—that is to say, in such a manner that when plus pressure exists in one end of the pump-barrel or in one working-vessel and minus pressure in the other, plus pressure will also exist, say to the right of *d*, and minus pressure to the left of *d*, within the barrel *a*, and vice versa, which condition of pressure will, resistances permitting, cause the plunger *d* and

ram *e* to traverse from right to left, and from left to right, alternately, in response to the play and change of plus and minus pressures in the pump from which the motions are to be derived. The chamber *k* communicates, as shown, with the right end of the barrel *a*, and above it is placed the clack-valve *l* in its chamber *u*, a communication with the chamber *c* being effected by the *m n*, so that when the ram *e* is moved toward the left water will be drawn into *c* from *a*. *o* is a clack-valve in its chamber *t*, and *p* is a pipe which must connect the chamber *t* with the steam-generator, so that when the ram *e* is moved toward the right water contained in the chamber *c* will be forced into the generator. It is obvious that the pressure attainable in the pipe *p* is nearly equal to the plus pressure of the actuating pump, multiplied by the area of *d* plus the minus pressure, multiplied by the area of *d* (minus the area of *e*) divided by the area of *e*; and as the area of *e* is less than that of *d* the pressure existing in *p* may exceed that existing in the pipes *i* or *j*. Should it happen that the water passing through the actuating pump is not fit for feed-water it will be well to close the passage between the barrel *a* and chamber *k* and attach to *k* a pipe leading to a body of purer water.

I claim—

The combination of the barrels *a* and *b*, plunger *d*, and ram *e* with the pipes *i* and *j* and valves *l* and *o*, substantially in the manner and for the purposes described.

NORMAN W. WHEELER.

Witnesses:

FRED. H. COLES,
A. D. PHELPS.

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