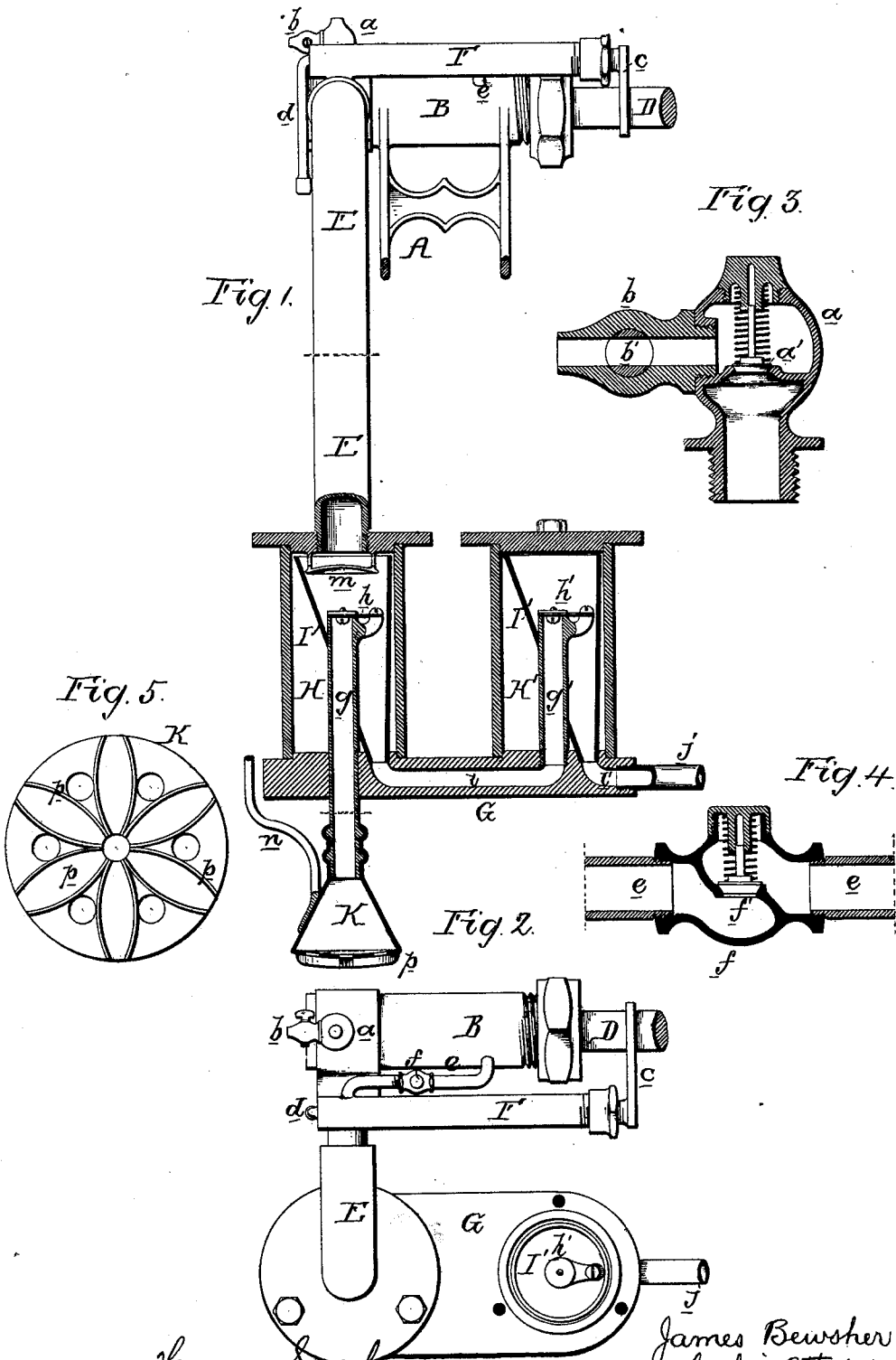


J. BEWSHER.

PUMP.

No. 175,012.

Patented March 21, 1876.



Witnesses, Harry Smith,
Hubert Howson

James Bewsher
by his attorneys,
Hudson and

UNITED STATES PATENT OFFICE.

JAMES BEWSHER, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF HIS
RIGHT TO JOHN SHAW, OF SAME PLACE.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **175,012**, dated March 21, 1876; application filed
August 7, 1875.

To all whom it may concern:

Be it known that I, JAMES BEWSHER, of Kansas City, Missouri, have invented certain Improvements in Pumps for pumping water mixed with sand or other granular material, of which the following is a specification:

The object of my invention is to construct a simple and effective apparatus for pumping water mixed with sand or other granular substances; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a side view, partly in section, of my improved pumping apparatus; Fig. 2, a plan view of the same, and Figs. 3, 4, and 5 detached views, illustrating different features of my invention.

A represents part of the frame-work of the apparatus, and to the upper end of this frame-work is attached a pump-barrel, B, provided with a plunger, D, and communicating with a pipe, E, which acts both as a suction and discharge pipe, as described hereafter. The end of the pump-barrel B is also provided with a chest, *a*, containing a check-valve, *a'*, and with a cock, *b*, the construction of which is illustrated more fully in Fig. 3. At one side of the pump-barrel B is arranged a smaller supplementary pump, F, provided with a plunger, which is operated through the medium of an arm, *c*, attached to the plunger of the main pump. The pump F has an inlet-pipe, *d*, and an outlet-pipe, *e*, the latter forming a communication between said pump F and the main pump B, and being provided with a check-valve, *f*, acted on by a spring, for a purpose explained hereafter. The construction of the check-valve *f* is illustrated in Fig. 4. To the base G of the apparatus are attached cylindrical casings, inclosing chambers H H', (two in the present instance,) the former chamber communicating at the top with the pipe E, and at the bottom with an inlet-pipe, *g*, through which the sand and water are drawn. This pipe *g* projects for a considerable distance above the bottom of the chamber H, and its upper end is provided with a valve, *h*, and projects into a tapering receiver, I, which communicates at

its lower end with a passage, *i*, formed in the base G. The opposite end of this passage communicates with a pipe, *g'*, similar to the pipe *g*, provided with a valve, *h'*, and extending into a tapering receiver, I', contained in the chamber H', the lower end of this receiver communicating with a passage, *i'*, into the outer end of which is screwed the discharge-pipe *j*. Within the chamber H, immediately below the opening of the pipe E, and between it and the top of the tube *g*, is arranged a concavo-convex screen or shield, *m*, the object of which will be rendered apparent hereafter. The lower end of the pipe *g* is provided with an agitator, K, the upper end of which is so secured to said pipe that it can be turned freely thereon by means of its operating-handle *n*, and its bottom being perforated and provided with a series of curved vanes, *p*, so that by partially rotating the agitator, the sand will be stirred up and caused to pass up with the water into the tube *g*.

The operation of the above-described apparatus is as follows: The chambers H and H' are arranged either above or below the surface of the water, the pump B and its connections being always above the surface. When the operation is first commenced the cock *b* is opened, the plunger of the pump B is then drawn back, and the pump-barrel consequently filled with air from the pipe E. When the plunger is forced in, this air is expelled through the check-valve *a* and cock *b*, and as this operation is repeated a partial vacuum is created in the pipe E and chamber H, which causes a rise of sand and water into and its discharge from the tube *g*. The water fills the chamber H and rises in the pipe E, and fills the pump-barrel B, the sand, however, striking the guard or shield *m*, and passing down through the tapering receiver I.

When the pump-barrel B becomes full of water the cock *b* is closed, and the body of water within the barrel is then alternately forced from the pump into the pipe E and drawn back again into the pump, so that a body of water free from grit is acted on by the pump, while the sand and water is drawn through the pipe *g* and forced out, through

the receiver I, into the passage *i*, and thence through the pipe *g'*, receiver I', and passage *i'* to the outlet-pipe *j*.

The pump F receives a supply of clear water through the pipe *d*, and, besides aiding in the filling of the barrel of the pump B at the outset, forces a supply of water into the same during its operation, in order to prevent any accumulation of air which may enter through the suction-pipe, or through imperfect joints, and which might interfere with the perfect operation of the apparatus.

The pump B is prevented from drawing water from the pump F during its backward stroke, owing to the presence in the connecting-pipe *e* of the check-valve *f*, which is acted upon by a spring, with a pressure sufficient to prevent any movement except that caused by the passage of the jet of water forced by the pump F.

It will be observed in Fig. 1 that the inlet tubes *g g'* project for some distance above the bottoms of the chambers H H', the object of which arrangement is to prevent the sand from interfering with the proper closing of the valves, which it would do if the valves were arranged directly on the bottoms of the chambers.

In order to prevent any lodgment of sand whatever in the chambers H H', the tapering receivers I I' are employed, these receivers conducting the mixture of sand and water directly to the outlets of the chambers.

The agitator K may be operated constantly or at intervals during the operation of the apparatus, in order to cause a thorough admixture of sand and water to be pumped up.

By the above-described apparatus I have frequently pumped water containing from twenty to fifty per cent. of coarse, heavy sand without any interference whatever with the proper operation of the valves, and without the access of any sand or grit to the barrel of the pump B.

If desired, one of the chambers H H' may be dispensed with, although I prefer two, as they cause a more uniform discharge than a single chamber, and in some cases, instead of

arranging the tapering receiver I within a chamber, the receiver may be dispensed with, and the casing of the chamber itself made funnel-shaped.

I claim as my invention—

1. In a machine for pumping water mixed with sand or other granular material, the combination of a piston or plunger pump, B, a suction-pipe, E, and one or more chambers H H', communicating with the discharge-passage, and provided with an inlet pipe or pipes, projecting above the bottom of the same, the various parts being so arranged and operating in such a manner that the mixture of sand and water will be received into and discharged from the chambers H H' without passing through the pump, all as set forth.

2. The combination of the elevated valve-seat of the inlet-pipe with a conductor, I, communicating with the discharge-passage, as and for the purpose set forth.

3. The combination of the inlet-pipe *g* with the agitator K, having a perforated bottom provided with flanges *p*, as set forth.

4. The combination of the plunger-pump B with a supplementary pump, F, connected to said pump B, and operated in unison with the same, all as and for the purpose described.

5. The check-valve *f*, arranged in the pipe *e*, between the pump F and the pump B, as and for the purpose described.

6. The combination of the cock *b* and check-valve *a'* with the pump B and pipe E not having a check-valve, as and for the purpose set forth.

7. The combination of the chambers H H', their inlet-pipes *g g'*, and tapering receivers I I', with passages *i i'* formed in the base G, as described.

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

JAMES BEWSHER.

Witnesses:

WILLIAM M. SMITH,
HOMER REED.