B. Morahan,

Sand Pump.

No. 58,457. Patented Oct. 2, 1866.

Fig 1

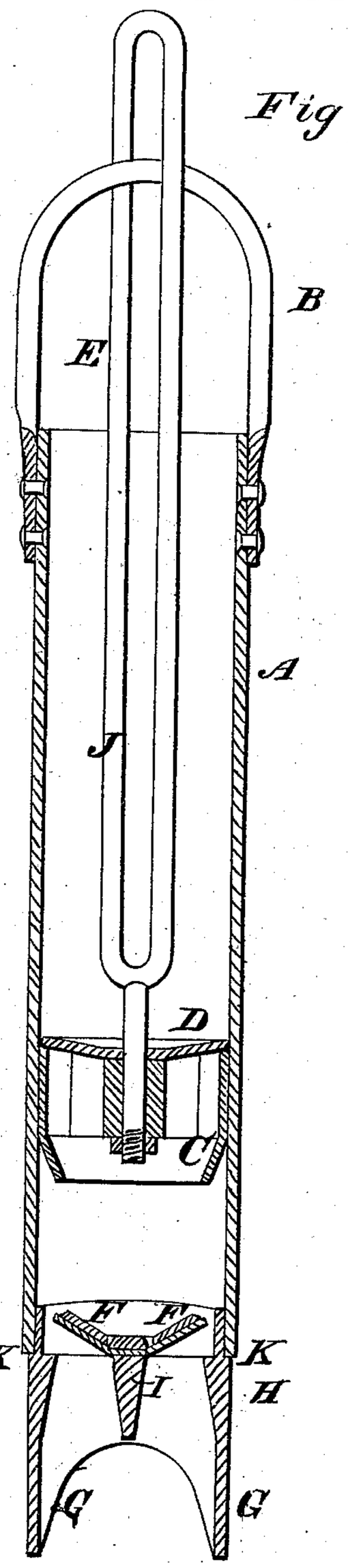


Fig 2.

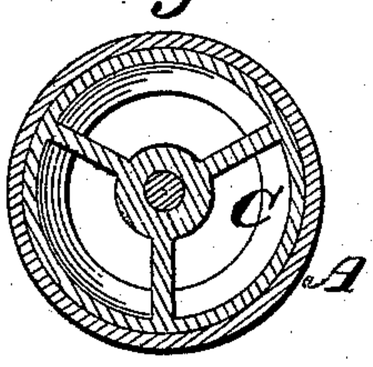


Fig 3.

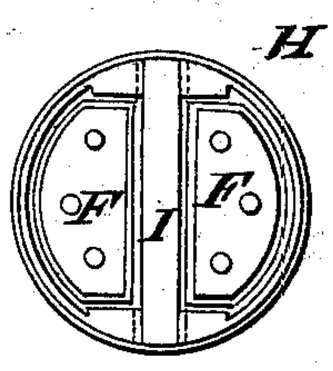
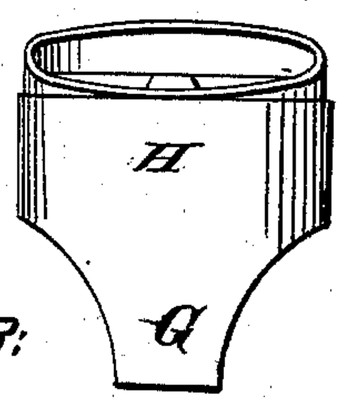


Fig 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

BERNARD MORAHAN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SAND-PUMPS.

Specification forming part of Letters Patent No. **58,457**, dated October 2, 1866.

To all whom it may concern:

Be it known that I, BERNARD MORAHAN, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Sand or Gravel Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an axial section of a pump made according to my invention. Fig. 2 is a cross-section of the pump, taken through the piston. Fig. 3 is a plan of the valve of the cylinder. Fig. 4 is a peripherical view of the bottom of the cylinder.

The object of this invention is the improvement in sand or gravel pumps for removing the detritus made in boring oil and other wells, both from the soil or driving pipe and from the bore of the well itself.

It consists in forming a loop in the piston-rod and connecting the bail of the cylinder therewith, so that it can be sprung out of the bail of the cylinder.

In pumping the sand or sediment out of Artesian wells which is made by the drills when boring, it is thought necessary to use the sand-pump twice in every two feet—once after the drill and once after the reamer. The valve of the sand-pump now in use is riveted in the bottom or end of a pipe or tube which is about six feet long and having a handle or bail. To this handle is attached a long link of a chain, to which the rope for lowering and raising is made fast. This constitutes the present sand-pump. The object of having this long chain-link, which is about ten inches long, attached to the handle is to be able to release the pump in case the pump should get fast in the bottom of the well, which it frequently does. When the rope is let slack the bottom of the link drops from the top of the bail or handle, and on pulling it suddenly up it strikes so hard against the handle as to have the effect of loosening the pump if fast. This is called "jarring;" consequently this long link is called the "jar." The manner in which the pump is used is to raise it up about three feet from the bottom and then let it drop suddenly. This is done about fifteen times in order to fill it. It is then raised and emptied. The workman lowers it down about five times after each withdrawal of drill and reamer, so as to take out all the sediment, and each time it is hoisted out it brings no more than about five pounds on an average of detritus or sediment. It usually takes a half an hour to sand-pump a well, and the sand-pump is used ten times in twenty-four hours.

The pumps are made of galvanized iron or of boiler-tubes. When made of boiler-tubes they last longer and sink faster than the others; but they are much harder to drill out when lost by getting fast at the bottom. The operators dare not let the pump rest a moment on the bottom, since the pressure of the water in the well, which is about five inches in diameter, and sometimes as much as six hundred feet deep, keeps packing the settling detritus or sediment about it so as to bind it in a few moments so firm and fast that the quickest and cheapest way to extract it is by drilling it out. It will take about twenty-four hours to drill out a boiler-tube pump, and about twelve hours to drill out one of galvanized iron.

Having thus described the old sand-pump and its manner of working, I will now describe my invention and its advantages over the old pump.

I will first speak of the valve, which is made fast in the bottom H of the pump. This is a double or twin valve, F F. The advantage this has over the old one is in this, that it affords more room for the sediment to pass in, the two wings F F being lifted up so as to stand almost upright, thereby giving almost as much opening on one side as the old one gives in its whole extent. The old valve being hinged on its side, as it rises its widest part must go toward the side of the pump, which therefore becomes narrow as it goes over; and if the valve were made much narrower than the pump, to allow it to rise more, it would be necessary to give it more seat, which would be only gaining opening one way and losing it the other.

One of the chief advantages of my construction over the old one is in giving much more room in the same space, and having a more firm and durable valve by hinging its wings

or leaves across its center on the center-piece I, in the manner shown.

Another part of my invention is to have a piston, C, made to work up and down in the pump, and made fast thereon is a long chain-link or jar, E, which serves as a piston-rod, and which is four or five feet long, and arranged so that as soon as the pump strikes the bottom of the well the sucker or piston C sinks in the pump, and on drawing it up is capable of sucking in about as much sand as the weight of the pump, which is about thirty pounds, and on being hoisted out of the well is much more handy than the old one to empty, as the driller can readily take the piston out of the cylinder A by bringing it up to the bail B, when the contents of the cylinder can be poured out. One of the sides of the loop of the piston-rod is split at J, near to the piston, forming a division therein, through which the bail can be passed when it is desired to remove the piston-rod and piston wholly from the pump for the purpose of emptying it, or for any other purpose.

It is impossible for this pump to get fast in the well, since in pulling it up the sucker draws in the sediment from around it through the openings on the side of the part H (which carries the valves F) between the legs G, and on the sucker or piston reaching the top of the pump the jar strikes the handle or bail, and this has also the effect of loosening it and of keeping it loose. It is very different with the old pump, it having no openings at the sides of the part which carries its valve, and having no suction but what is caused by pulling it up and letting it drop suddenly. A fresh leather may easily be put on the piston-valve when it is worn so much as to become too small for the pump, since I have made it an object to have it as simple as possible.

The bail B is of such a height as to arrest the piston in its descent before it reaches the valves F of the bottom of the cylinder, the upper end of the loop in the piston-rod striking on the top of the bail. When the piston descends the lower valves, F, will become closed, and the contents of the pump-cylinder will pass through the valve D of the piston into the upper part of the cylinder. The piston C is of such dimensions as to fill the cylinder A, but not so tightly as to prevent it from moving easily. The feet G are in this example projected downward only on two sides of the bottom H of the pump, thereby leaving openings on the other sides thereof, through which the detritus and water have access to the valves F. The part H of the pump, which contains the lower valves, F, has a shoulder, K, around its upper edge, which receives the lower edge of the pump-cylinder A.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The split-linked piston-rod E, in combination with the piston C, operating with the bail B, firmly secured to the cylinder A, as and for the purpose specified.

The above specification of my invention signed by me this 15th day of September, 1865.

BERNARD MORAHAN.

Witnesses:
H. FULTON,
W. G. GRANGE.