F. Crocker,

Oil Pump

No. 44,610. Patented Oct. 11, 1864.

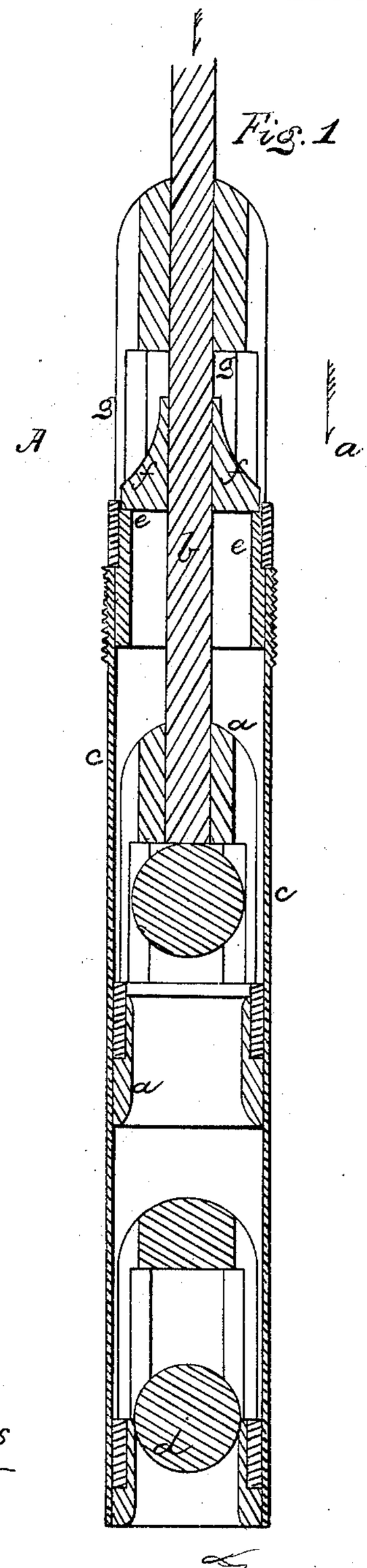

Fig. 1

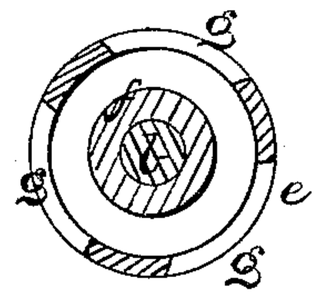

Fig. 2.

Witnesses
J. Hodgeir
J. S. Chase

Inventor
Fremont Crocker

UNITED STATES PATENT OFFICE.

FREDERICK CROCKER, OF TITUSVILLE, PENNSYLVANIA.

IMPROVEMENT IN LIFTING-PUMPS.

Specification forming part of Letters Patent No. **44,610,** dated October 11, 1864.

To all whom it may concern:

Be it known that I, F. CROCKER, of Titusville, Crawford county, and State of Pennsylvania, have invented a new and useful Improvement in Lifting-Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section, and Fig. 2 a horizontal section taken at the line A *a* of Fig. 1.

The same letters indicate like parts in both figures.

In the use of lifting-pumps, particularly in petroleum-wells of considerable depth, much inconvenience has heretofore been experienced. With a view to economy such wells are made with a bore of only a few inches in diameter, just sufficient to receive the pump-barrel, the insertion of which frequently cuts off the pressure of the atmosphere from the surface of the liquid at the bottom, and even when such is not the case it is necessary to introduce packing between the bore of the well and the pump-barrel to shut off what are termed "surface leaks"—that is, all foreign liquids which tend to flow into the well from sources above that from which the liquid to be pumped flows. Whenever from these or other causes the atmosphere does not press on the surface of the liquid to be pumped, and such liquid does not rise to a sufficient height in the well to force the liquid up in the pump-barrel below the piston, as fast or as high as the piston is lifted, as the piston begins to descend the whole column of water above descends with it to a greater or less extent, depending upon the deficiency of the hydrostatic pressure in the well to fill up the space below the piston during its ascent. In this way much power is wasted. To avoid this, lifting-pumps have long since been made with a sustaining-valve placed above the level of the piston when at its greatest elevation, which valve opens in an upward direction to permit the free passage of the column of water during the upward motion of the piston, and which closes to sustain such column the moment the piston begins to descend; but in such cases this sustaining-valve has been placed at the lower end of an eduction-pipe branching off from the upper end of, and of necessity by the side of, the barrel in which the piston works, thus requiring an expensive structure, which is difficult to get at for repairs, and which of necessity requires a well of comparatively large bore.

The object of my invention is to avoid all the above-named inconveniences; and to this end my said invention consists in combining with the reciprocating piston of a lifting-pump a sustaining-valve placed above and concentric with the piston, formed with a central bore, through which and in which the piston-rod works, and having its seat in the barrel of the pump.

In the accompanying drawings, *a* represents a piston of any suitable construction for a lifting-pump, and *b* the piston-rod which is to be extended up to the required height, or to be connected by a link-rod with the motive power above in any suitable manner, not necessary to be described, as this makes no part of my invention. This piston is properly fitted to work in a cylindrical barrel, *c*, provided at the lower end with the usual induction-valve, *d*. To the upper end of the barrel *c*, and concentric therewith, is a valve-seat, *e*, to which is properly fitted the lower end of a sliding valve, *f*, and this valve has a central bore, through which the piston-rod *b* passes freely but accurately. This valve-seat *e*, I prefer to make separate from and properly fitted to and secured in the upper end of the pump-piston barrel *c*, and so formed as to extend above the valve, to act as a check to prevent it from being lifted too high, the part so extended above the valve forming at the same time a guide for the piston-rod, water-ways *g* being formed at the sides for the free passage of the liquid.

The outer periphery of the upper end of the barrel *c* may be tapped or otherwise secured in the usual or any appropriate manner to the pump-barrel; but as this makes no part of my invention it is deemed unnecessary to represent it.

By reason of the above-described invention it will be seen that the whole column of liquid lifted by the upward motion of the piston will be sustained by the valve *f* during the descent of the piston without the necessity of using branch pipes, so that a lifting-pump with a sustaining-valve can be inserted and used in a

well of as small a bore as for a pump without a sustaining-valve, and affording like means for repairs.

What I claim as my invention, and desire to secure by Letters Patent, is—

Combining with a piston of a lifting-pump a sustaining-valve, when such valve is placed above, concentric, and free to play on the rod of the piston, and has its seat in the barrel of the pump, substantially as and for the purpose specified.

FREDERICK CROCKER.

Witnesses:
JAMES H. ANGIER,
J. T. CHASE.