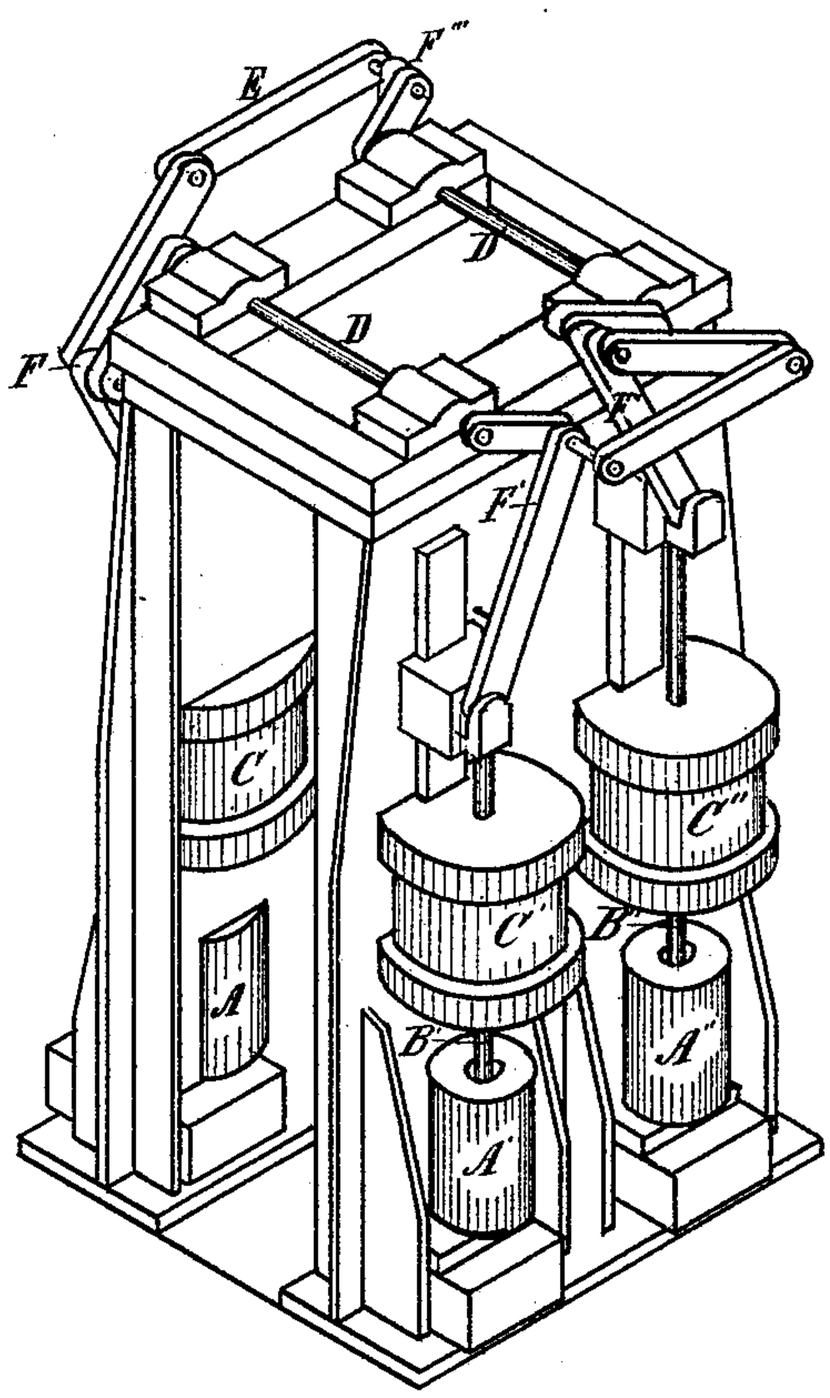
F. CROCKER, Sr.

Combination Pump.

No. 220,913. Patented Oct. 28, 1879.



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UNITED STATES PATENT OFFICE.

FREDERICK CROCKER, SR., OF OLEAN, NEW YORK.

IMPROVEMENT IN COMBINATION-PUMPS.

Specification forming part of Letters Patent No. **220,913**, dated October 28, 1879; application filed August 30, 1879.

To all whom it may concern:

Be it known that I, FREDERICK CROCKER, Sr., of Olean, Cattaraugus county, New York, have invented an Improved Combination-Pump for Pumping Liquids under High Pressure, of which the following is a specification.

My invention relates more particularly to pumps used in pumping petroleum or other fluids through long lines of pipe or to high elevations where the pressure upon the pipe is very great, the object being to produce an even pressure when the pump is in operation.

In a pump of one or two cylinders there are inevitably dead centers where the pressure is relieved, and the uniform flow of the fluid checked. I obviate this by connecting and using four pump-cylinders, so arranged and connected that one of the cylinders is exerting its full force while the others are turning the center or drawing back. This I do by setting four direct single-acting vertical pumps in a frame, and connecting their piston-rods with crank-shafts and parallel rods in such manner as to produce the result desired.

In the drawings, A A′ A″ represents three of the pumps, (the fourth being concealed by the frame-work,) B B′ B″ the piston-rods, C C′ C″ the steam-cylinders. The pumps are single-acting, forcing on the downward stroke. The steam-cylinders are the ordinary double-acting.

Pipes and valve connections are made in the ordinary manner; these are not shown, as being unnecessary and tending to confuse the drawings.

The piston-rods B B′ are connected with two cranks, F F′, on the shaft D, and the piston-rod B″, and the rod to the pump concealed by the frame to two cranks, F″ F‴, on the rod D′. The cranks on each shaft are set at right angles with each other. The two shafts are connected by the parallel rods E E′, each rod being attached at one end to the same pin as the connecting-rod, and on the other end to a double crank moving opposite to the connecting-rod. By this arrangement the two cranks F′ F″, and, consequently, the piston-rods B′ B″, reciprocate with each other, and also the two cranks F F‴ reciprocate while being set at right angles with the cranks F′ F″. The four are set at the four quarters of the circle, and, therefore, as they revolve simultaneously, each pump in its turn forcing the fluid into the common pipe, there is a constant and equal flow of fluid. The steam-cylinders being double-acting, the power of each cylinder on the upward stroke is exerted through the machinery upon the other pumps.

Another advantage in these pumps is that, working vertically, all sediment or grit in the fluid gravitates to the bottom of the pump, and is carried off through the pipes, while in pumps working horizontally it collects on the bottom side of the plunger and wears the plunger and cylinder unequally.

It is apparent that if more power or capacity is required, additional pumps in pairs may be added and connected in the same manner by extending either the shafts D D′ or the parallel rods E E′.

I claim as my invention—

1. The shafts D D′, cranks F F′ F″ F‴ and parallel rods E E′, together with the connecting-rods, as a means of connecting together the piston-rods of steam-pumps, substantially as described.

2. A combination-pump, formed of four or more single-acting vertical steam-pumps, the whole connected together by the connecting-rods, cranks F F′ F″ F‴, shafts D D′, and parallel rods E E′, arranged to act in rotation, and produce an even and uniform pressure upon the delivery-pipe, substantially as described, and for the purposes herein set forth.

FREDERICK CROCKER, SR.

Witnesses:

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