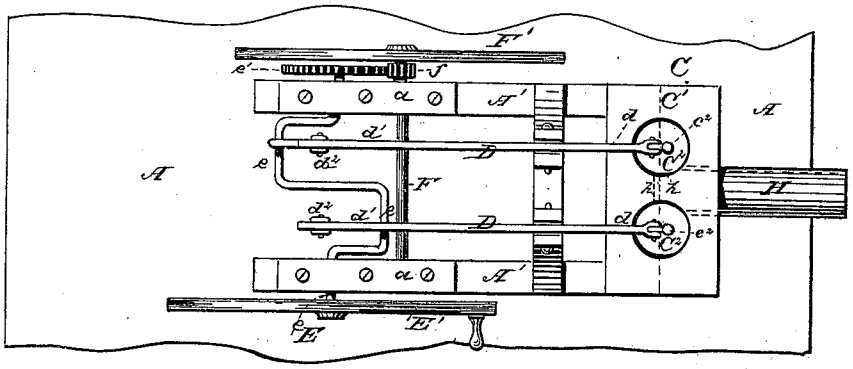
3 Sheets—Sheet 1.

W. S. LANEY.

FORCE-PUMPS.

No. 193,665. Patented July 31, 1877.

Fig 1.



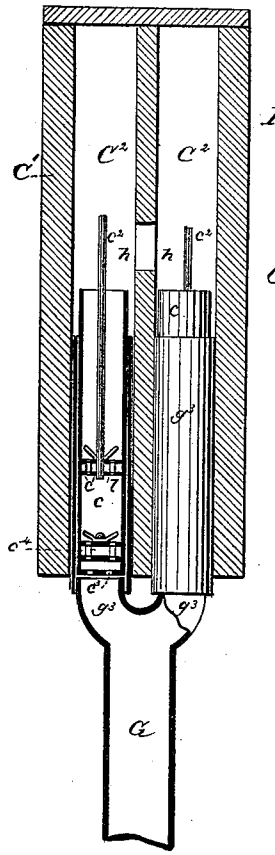


Fig. 3.

Fig. 5



Fig. 6

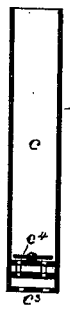
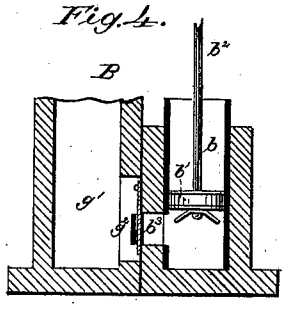


Fig. 4.



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FORCE-PUMPS.

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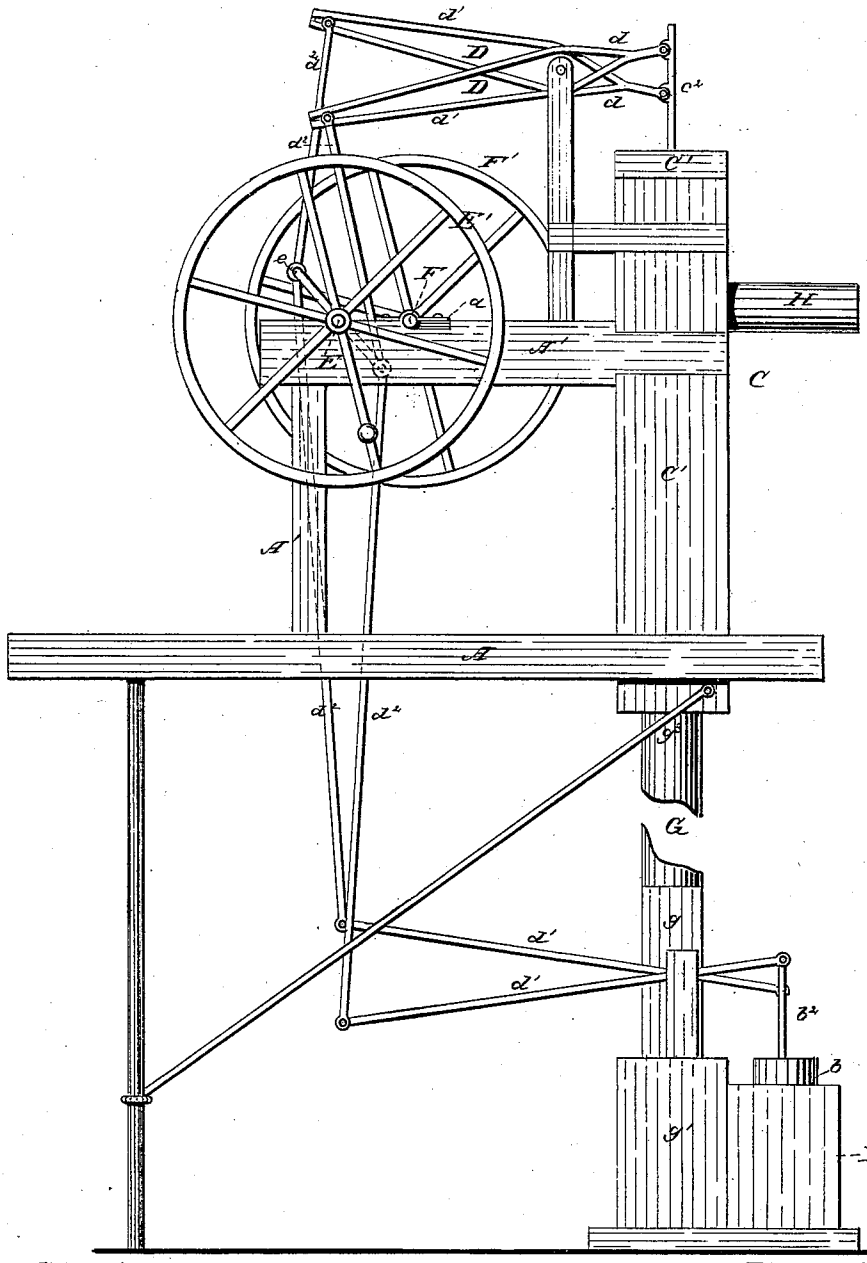
Fig. 2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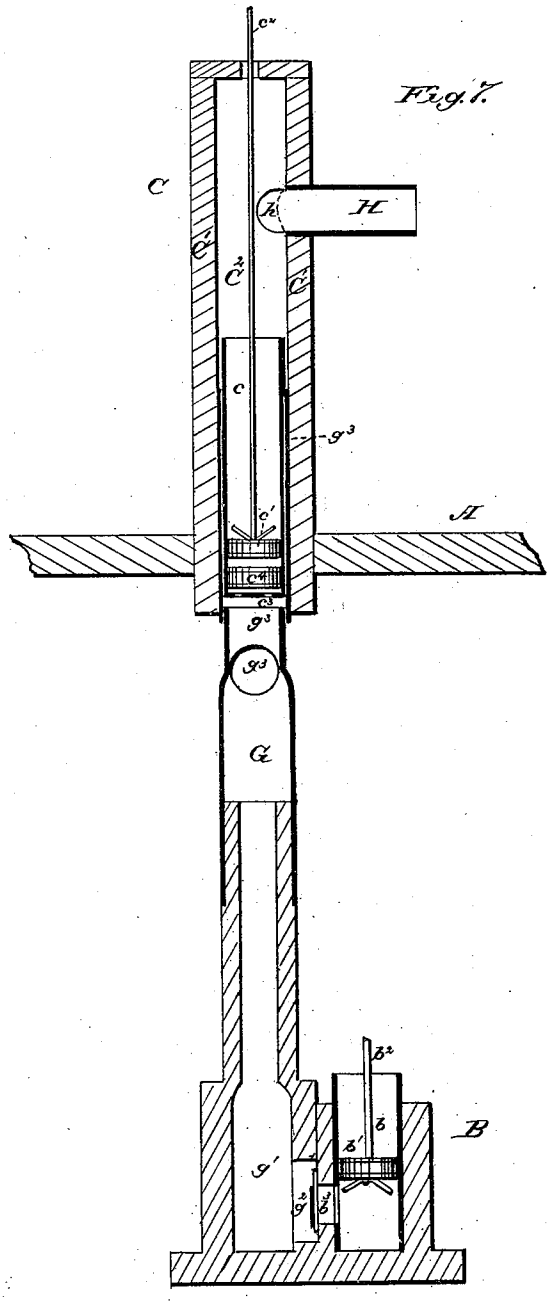

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UNITED STATES PATENT OFFICE.

WILLIAM S. LANEY, OF LITHOPOLIS, OHIO.

IMPROVEMENT IN FORCE-PUMPS.

Specification forming part of Letters Patent No. **193,665**, dated July 31, 1877; application filed June 22, 1877.

To all whom it may concern:

Be it known that I, WILLIAM S. LANEY, of Lithopolis, in the county of Fairfield and State of Ohio, have invented certain new and useful Improvements in Force-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 which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to improvements in pumps particularly applicable for raising water from deep wells, the nature of which will be fully explained by reference to the accompanying drawings, in which—

Figure 1 represents a plan, Fig. 2 a side view, and Fig. 3 is a vertical cross-section of a part of a pump constructed according to my invention. Figs. 4, 5, and 6 are detail views, and Fig. 7 is a vertical longitudinal section.

In each of the views similar letters of reference are employed to indicate corresponding parts wherever they occur.

A represents a frame or platform applied over a well, and A′ the main framing of the pump.

B represents a force and C a lift pump, each of which is provided with a pair of piston-cylinders, *b b* and *c c*, and pistons or buckets b^1 c^1, operated by piston-rods b^2 b^2 c^2 c^2.

The piston-rods b^2 b^2 c^2 c^2 are each connected to the short arm *d* of a pivoted lever, D, the long arms d^1 of which, by rods d^2, are connected in pairs to the cranks *e* of a revolving shaft, E, working in bearings *a* carried by the framing A′.

On one end of the shaft E is mounted a fly or driving wheel, E′, while on the opposite end is applied a pinion, *e′*, gearing into a pinion, *f*, affixed on a shaft, F, upon the outer end of which is mounted a fly-wheel, F′.

It will thus be seen that the pistons or buckets b^1 c^1 of the pumps B C are operated simultaneously in pairs.

G represents the supply column or pipe which connects the pumps B C. The pipe G, at its lower end *g*, is in communication with the valve-chamber g^1, in which is arranged a pair of valves, g^2, opening into the chamber g^1, arranged over passages b^3, (one for each cylinder,) which connect the cylinders *b b* with the chamber g^1.

The pistons b^1 are formed with valve-passages controlled by flap or other suitable valves opening inward or on the upstroke.

The pipe G, at its upper end, is forked or branched so as to form two pipes, g^3 g^3, for the reception of the cylinders *c c* of the pump C. These cylinders *c c*, at their lower ends, are provided with screens or gratings c^3, above which are arranged the valve-plates c^4, provided with valve-passages controlled by valves opening upward. The pistons c^1 are also provided with valve-passages controlled by valves opening upward or on the downstroke.

The pipes g^3 g^3 and cylinders *c c* are applied in the end of the pump-case C^1, which is provided with chambers C^2, forming a continuation of the pipes g^3 g^3.

H represents the delivery, which is connected by side passages *h* with the chambers C^2.

It will be readily seen that by forming the cylinders *c c* separate from the pipes g^3 g^3 and pump-case C^1, the said cylinders, with their valves and gratings, may be readily removed from the pump for repairs or cleaning.

The pump B will be applied in the well below the surface of the water.

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

1. The combination, with the pump B, having cylinders *b*, buckets or pistons b^1, and column G, operating as described, of the pump C, having pipes g^3 g^3, case C^1, removable cylinders *c c*, and pistons c^1, constructed and operating as described.

2. A pump, having removable cylinders *c c*, provided with gratings or screens c^3 c^3, and valves c^4 c^4, substantially as described.

3. The combination, with the pistons or buckets b^1 c^1, and rods b^2 c^2 of the pumps B C, of the pivoted levers D, levers d^2, crank *e*, shaft E, wheel E′, pinions *e′* and *f*, and shaft F, and fly-wheel F′, the whole being constructed to operate substantially as shown and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLIAM S. LANEY.

Witnesses:
J. V. LEE,
FRANK W. ARNOLD.