

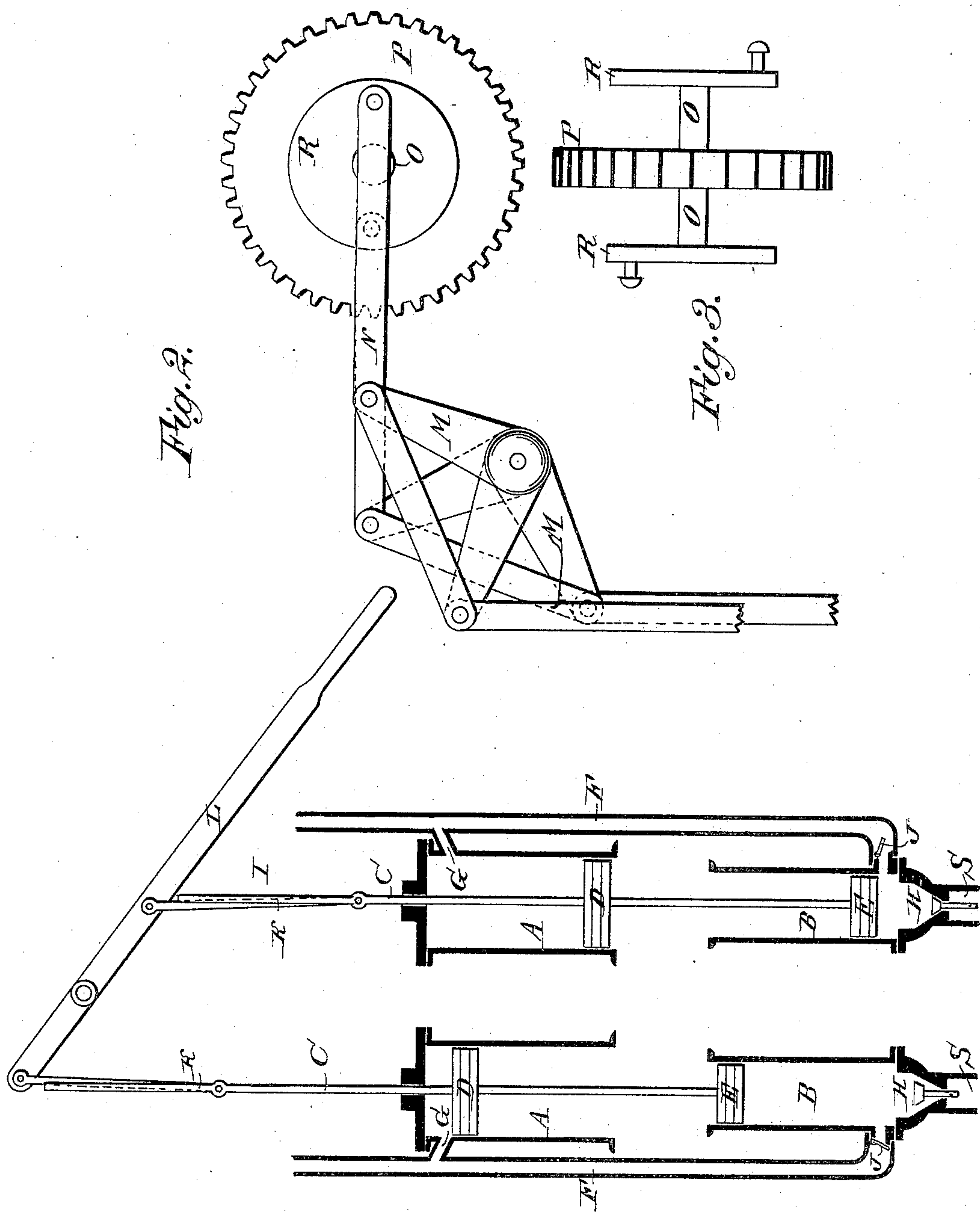
(No Model.)

H. MORTENSEN.

PUMP.

No. 314,705.

Patented Mar. 31, 1885.



WITNESSES:

*Wm. Beyer*  
*C. Sedgwick*

*Fig. 1.*

INVENTOR:

*H. Mortensen*

BY

*Munn & Co*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

HANS MORTENSEN, OF LEADVILLE, COLORADO.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 314,705, dated March 31, 1885.

Application filed September 23, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HANS MORTENSEN, of Leadville, Lake county, Colorado, have invented a new and Improved Pump, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved pump which is so constructed that it almost balances itself, and the power required need only be sufficient to lift the amount of water discharged in each stroke.

The invention consists in the combination, with two upper cylinders open at the bottom and two lower cylinders open at the top, of piston-rods passing through the cylinders of each pair, pistons mounted on the rods and contained in the cylinders, and of levers or cranks for operating the piston-rods in opposite directions. The top and bottom cylinders of each pair are connected with a stand-pipe.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a cross-sectional elevation of my improved pump. Figs. 2 and 3 are views of a modification of the same.

Two cylinders, A, open at the bottom, are arranged directly above two cylinders, B, open at the top, the cylinders B being of less diameter than the cylinders A. Piston-rods C extend through the corresponding cylinders, A and B, and on the piston-rods the pistons D and E are mounted within the cylinders A and B, respectively. A stand-pipe, F, extends upward from the bottom of each cylinder B, and the said stand-pipes are connected with the upper ends of the cylinders A by short connecting-pipes G. Check-valves H are arranged in the bottoms of the cylinders B, and check-valves J are arranged at the lower ends of the stand-pipes F. The piston-rods C are con-

nected by connecting-rods K with a pivoted rocking-lever L, as shown in Fig. 1; or they may be connected by the elbow-levers M and rods N with disks R on a shaft, O, carrying a cog-wheel, P, which engages with other gearing. The rods N are pivoted to the disks O at diametrically-opposite points. The suction-pipes S are connected with the bottom cylinders, B.

The operation is as follows: When a piston-rod descends, the lower piston, E, forces the water from the bottom of the corresponding lower cylinder up through the stand-pipe F. As the upper piston also descends the water from the stand-pipe passes into the upper part of the upper cylinder and acts upon the said upper piston, whereby the pump is balanced, the other upper piston ascending at the same time. When the aforesaid piston-rod rises, it forces the water from the upper cylinder up through the stand-pipe F, and the lower piston draws water into the lower cylinder. The piston-rods in the two pairs of cylinders move in opposite directions—that is, when one ascends the other descends.

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

In a pump, the combination, with the cylinders A, open at the bottom, and the cylinders B, open at the top, of the piston-rods C, the pistons D and E, mounted on the same within the cylinders A and B, respectively, and of the stand-pipes F, connected with the bottoms of the cylinders B and the tops of the cylinders A, substantially as herein shown and described.

HANS MORTENSEN.

Witnesses:

GUS ANDERSON,  
ANTON SIMON.