3 Sheets--Sheet 1.

J. P. FLANDERS.

Double-Acting Force-Pumps.

No. 140,819. Patented July 15, 1873.

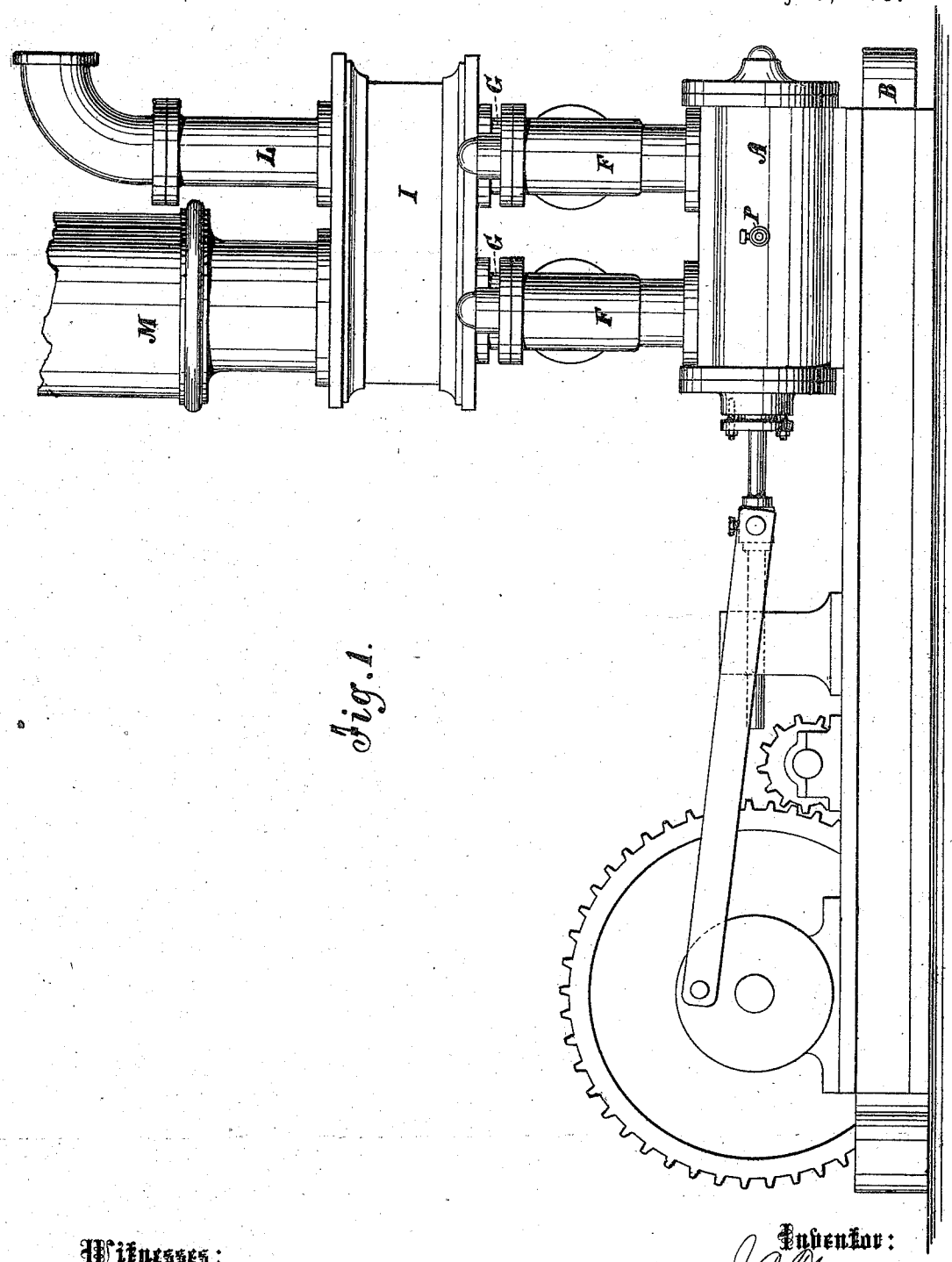

Fig. 1.

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3 Sheets--Sheet 2.

J. P. FLANDERS.

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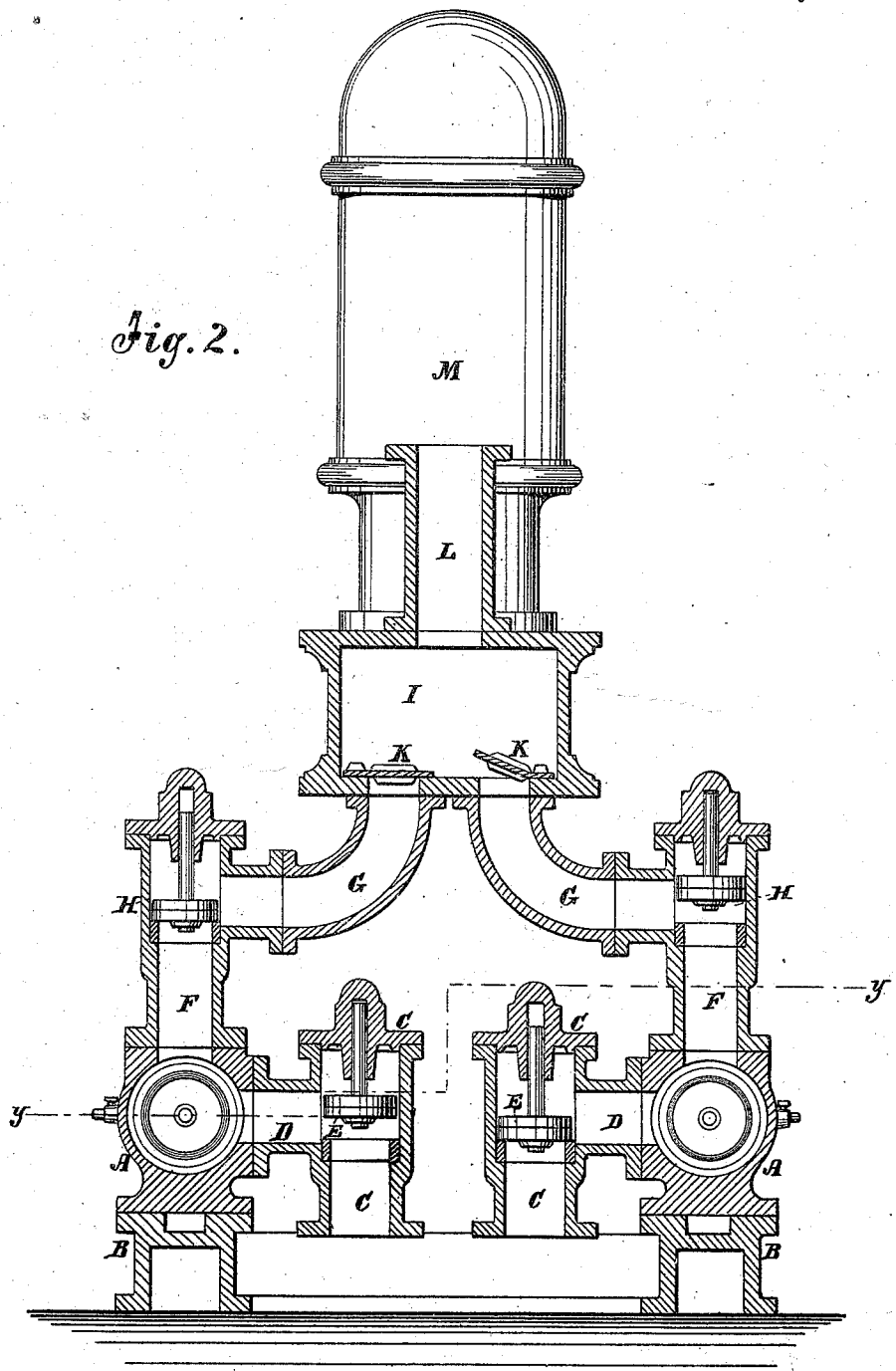
Fig. 2.



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3 Sheets--Sheet 3.

J. P. FLANDERS.

Double-Acting Force-Pumps.

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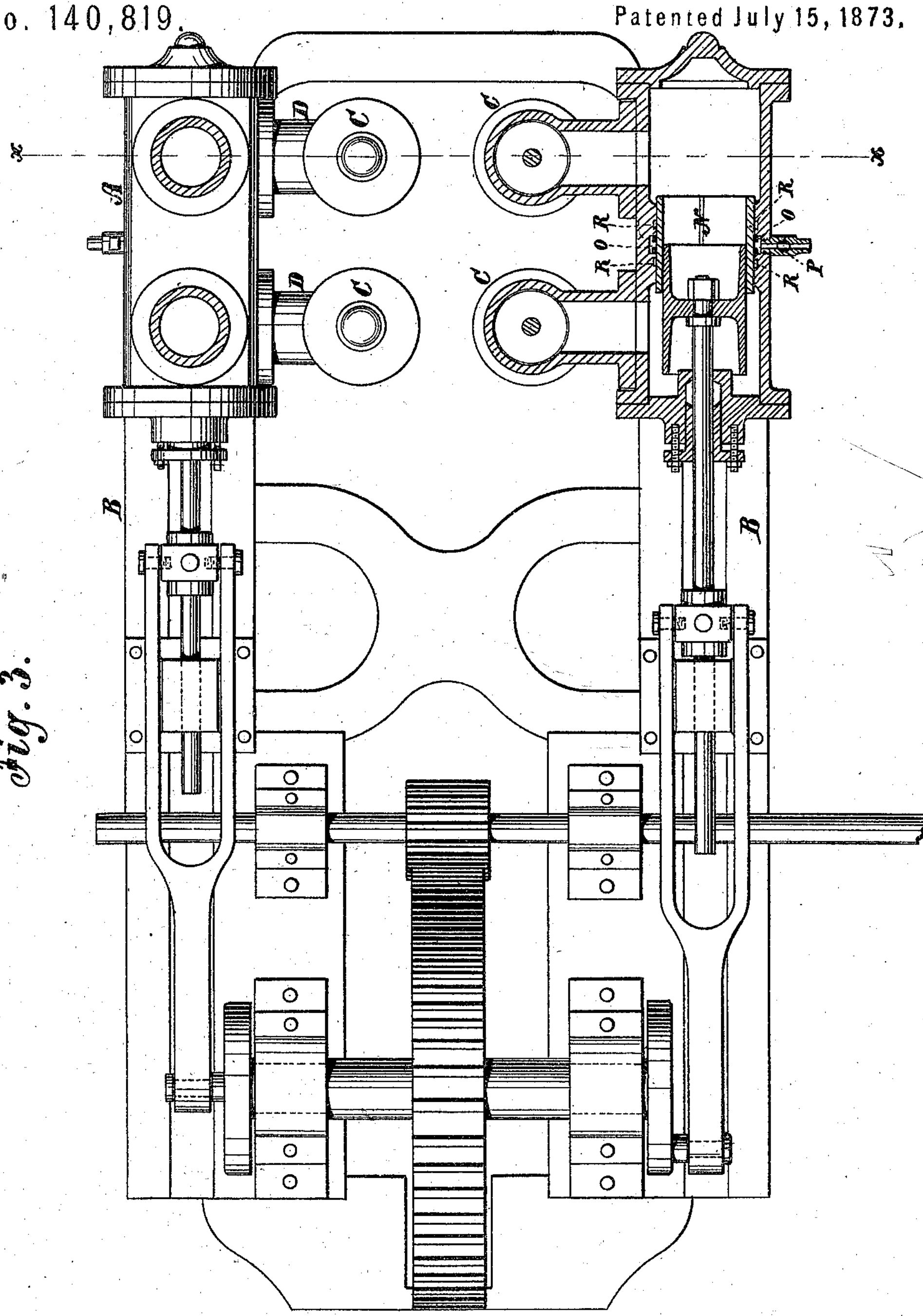
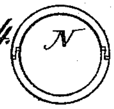


Fig. 3.

Fig.4



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UNITED STATES PATENT OFFICE.

JOHN P. FLANDERS, OF VERGENNES, ASSIGNOR TO HIMSELF, ELI B. HAYES, OF SAME PLACE, AND H. M. MITCHELL, OF BURLINGTON, VERMONT.

IMPROVEMENT IN DOUBLE-ACTING FORCE-PUMPS.

Specification forming part of Letters Patent No. **140,819**, dated July 15, 1873; application filed April 5, 1873.

To all whom it may concern:

Be it known that I, JOHN P. FLANDERS, of Vergennes, in the county of Addison and State of Vermont, have invented a new and useful Improvement in Force-Pumps, of which the following is a specification:

The invention consists in the improvement of force-pumps, as hereinafter described and pointed out in the claims.

Figure 1 is a side elevation of my improved pump. Fig. 2 is a transverse section on line *x x* of Fig. 3. Fig. 3 is a horizontal section on line *y y* of Fig. 2. Fig. 4 is a cross-section of the longitudinally-divided barrel.

Similar letters of reference indicate corresponding parts.

A represents the cylinders, which are arranged on each side of a wide bed-frame, B. C represents the suction-pipes, of which there are two to each pump. The pumps being double acting these suction-pipes are arranged between the cylinders rising vertically from the well or reservoir, and connected to them by horizontal branches D at the upper ends above the check-valves E. F represents the discharge-pipes, of which there are also four rising vertically a short distance above the cylinders, and there continuing by curves G above the check-valves into a discharge-box, I, at the bottom, where the check-valves K are arranged to prevent the back flow. These pipes support the discharge-box and the air-chamber. L is a pipe from which the water is discharged from the box I, and M is an air-chamber.

For packing the pistons I propose to have the barrels N, in which they work, divided in two or more longitudinal parts with lap-joints at the edges, so that they can contract and expand a little without opening seams for the escape of water, and I provide a small annular channel, O, surrounding the barrel, in which I maintain a high degree of pressure by water admitted through a pipe-connection, P, from any suitable head or source, and, to prevent this water from leaking past the barrel, I arrange packing-rings in the channel. To hold the barrel in position and allow them to be free to expand and contract, I form notches R in the shell in the cylinder, and lugs in the barrels, which project into the notches and hold the barrels against the end motion.

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

1. The arrangement of the cylinders A, bed-frame B, suction-pipes C D, discharge-pipes F G, discharge-box I, and the air-chamber, substantially as specified.

2. A sectional piston-barrel, contracted upon the piston for packing it by hydrostatic pressure, applied in the manner described.

JOHN P. FLANDERS.

Witnesses:

GEO. R. CHAPMAN,

J. E. YOUNG.