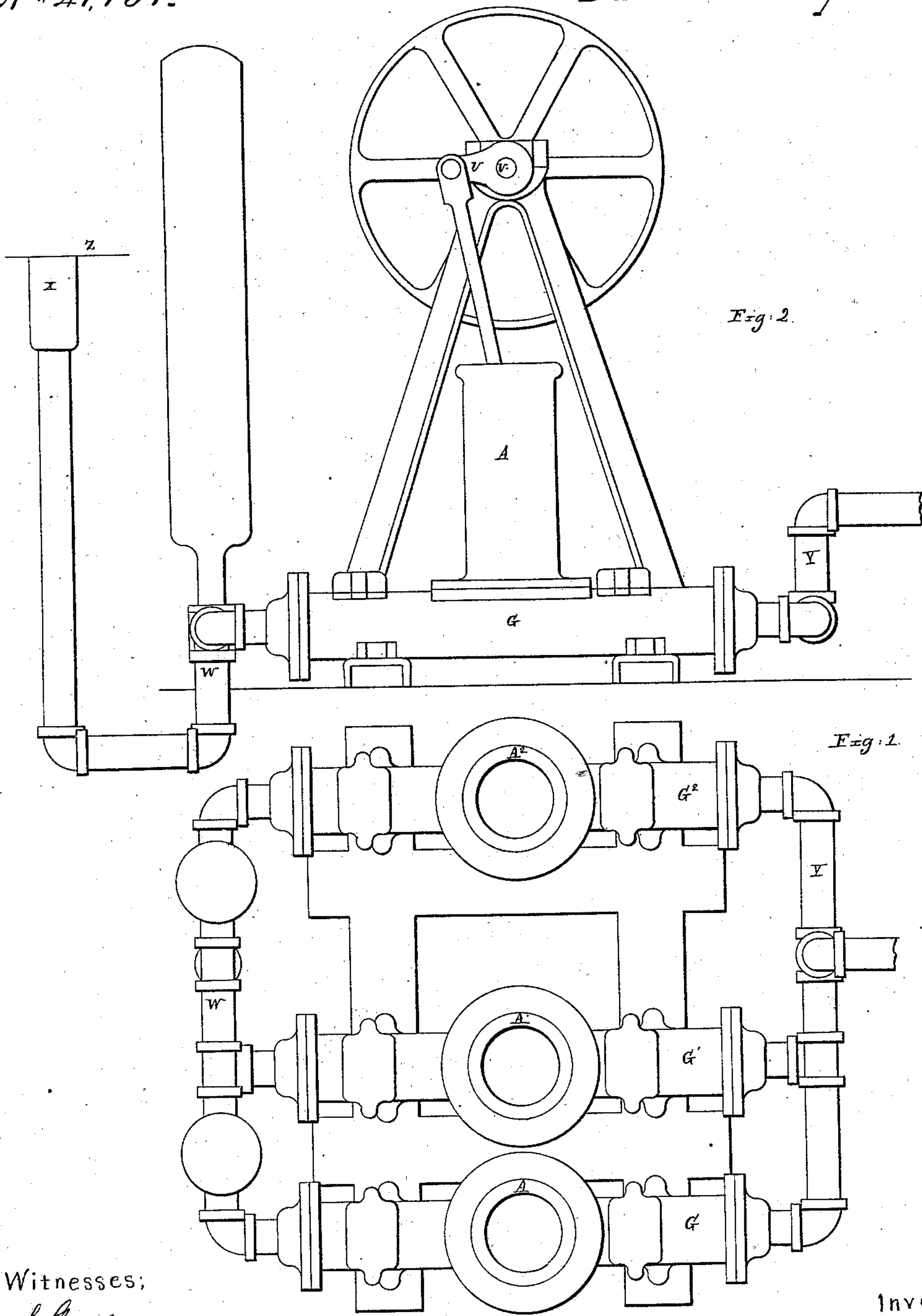


W. B. Le Van,

Double-Acting Pump,

N^o 47,737.

Patented May 16, 1865.



Witnesses;

S. Lloyd Mearns
John Herbig

Inventor:

W. Barnet Le Van

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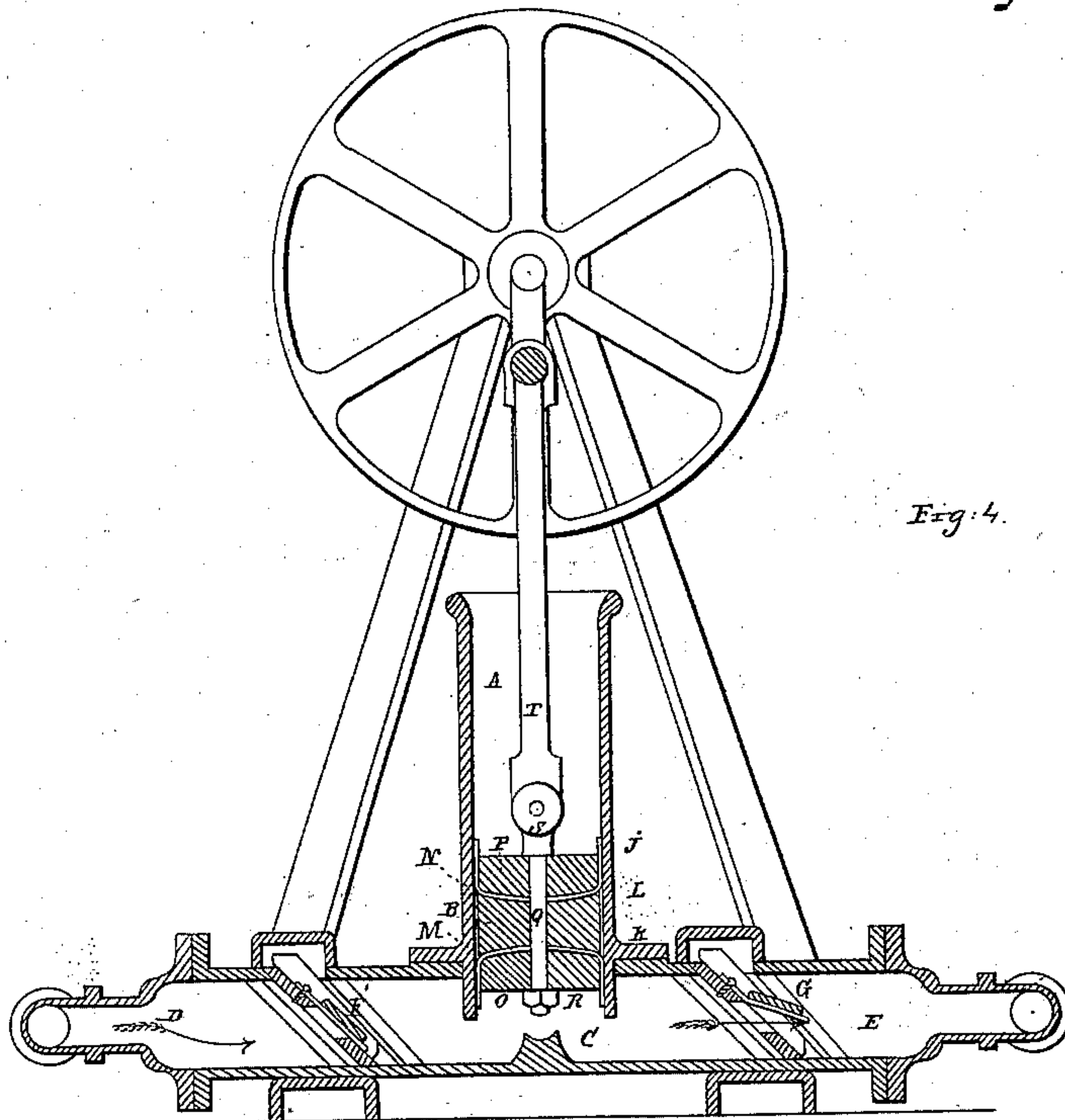


Fig. 4.

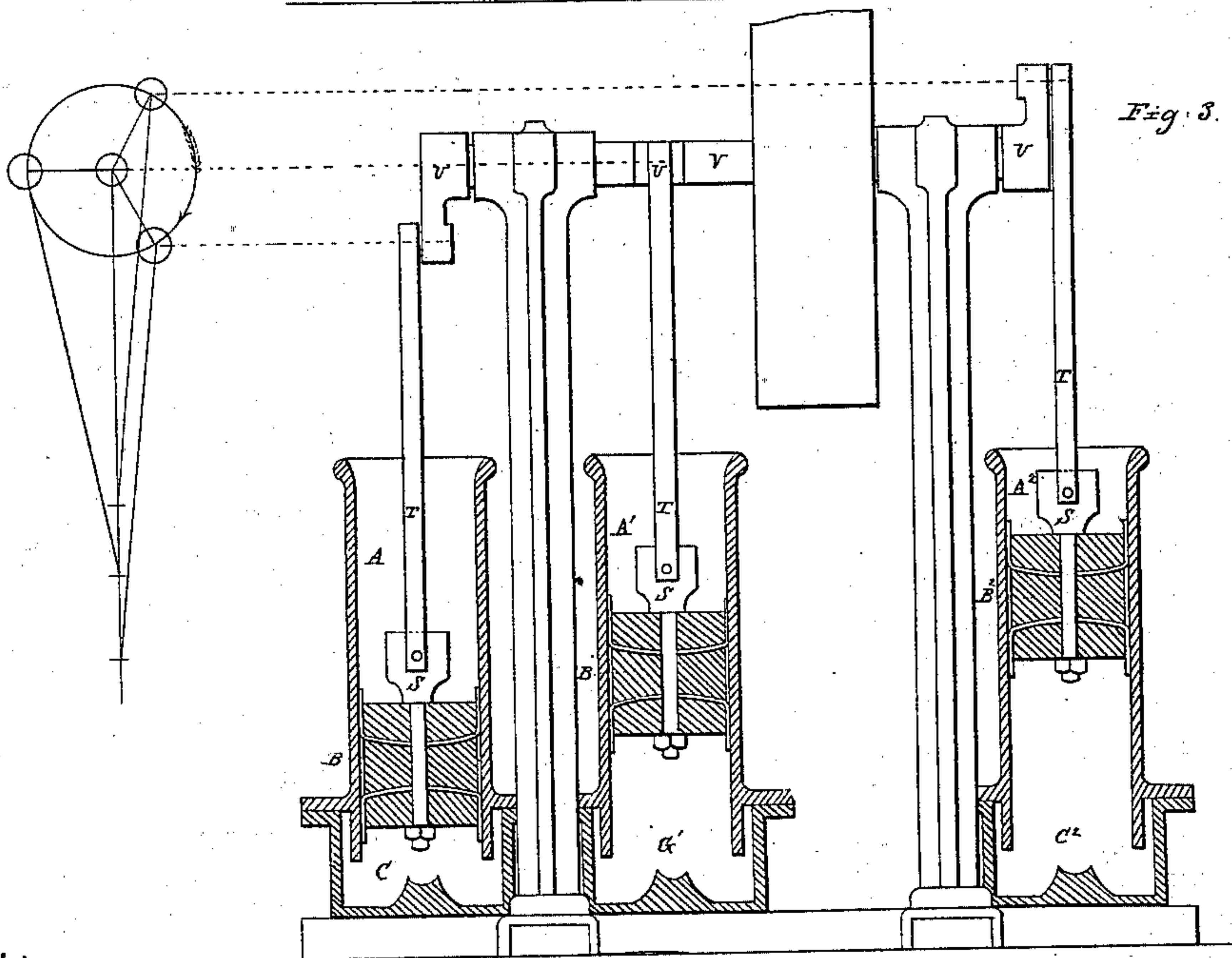


Fig. 5.

Witnesses:

*Lloyd Meigs and
John Herbig*

Inventor:

W. Barnett Le Van

UNITED STATES PATENT OFFICE.

W. BARNET LE VAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 47,737, dated May 16, 1865.

To all whom it may concern:

Be it known that I, WILLIAM BARNET LE VAN, of the city of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in the Apparatus for Exhausting the Water from Paper-Making Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the drawings annexed, and the letters of reference marked thereon.

The nature of my invention consists in a combination of two or more peculiarly constructed pumps, connected in such a manner as to draw or exhaust from the suction-box of Fourdrinier or other paper-making machines, and effecting thereby a certain suction or vacuum and nearly uniform discharge of water from the suction-boxes with greater celerity and less trouble and attention than has been requisite with the apparatus heretofore used for the purpose, and at the same time allowing the machine to be run at a higher velocity, thus producing a larger yield of an improved quality of paper.

Figure 1 represents a plan of the apparatus. Fig. 2 represents a front elevation. Fig. 3 represents a sectional elevation. Fig. 4 represents one pump in section, exhibiting the valve and plunger.

A, A', and A² are cylinders containing plungers B, B', and B², which are turned to fit accurately, but so as to permit vertical motion in the cylinders.

C, C', and C² are bases containing the channel D of inlet to and E of outlet from the cylinders A, A', and A², which may be seen in Fig. 4. In the channel D is placed the valve F, of the variety known as a "clack-valve," placed so that the valve when closed is oblique to the horizontal line of the channel D. A similar valve, G, is placed in the same manner in the channel E. The only difference between the arrangement of the valves F and G is that the valve F opens inward toward the cylinder A and the valve G opens outward from the cylinder.

The construction of the pump-plunger B is peculiar. The packing, which consists of a cupped leather, I, an inverted cupped leather,

K, and an intermediate block of metal, L, which is made of such a form as to support, by the fillet-shaped rims M and N, the bent portions of the cupped leathers I and K. This construction of plunger having the cupped leathers at the bent portions sustained by the fillet-shaped rims of the block L is the feature of superiority of this plunger over those formerly used, and imparts the increased durability to the packings, for the reason, which is apparent upon inspection—viz., that the fibers of the leathers are not strained as when bent at an abrupt angle, and, being clamped securely at that point, do not wear at the points of contact with the rims of the blocks O and P, as is the case with pistons made of two cupped leathers without any intermediate block. The cupped leather K is supported by the block O, and the cupped leather I is supported by the block P, which is turned to fit the cavity of the cup-leather I. The block P, cupped leather I, block L, leather K, and block O are secured to each other by the bolt Q and nut R, which bolt also holds the joint S, to which the connecting-rod T is attached. The connecting-rod T is actuated by the crank U on the rotating shaft V.

It will be obvious on inspection by any hydraulic engineer that the pump hereinbefore described is single-acting, and when in motion receives and discharges fluid in the direction of the arrows in Fig. 4. The position of the several cranks on the shaft V is such that the maximum velocities of the several pistons shall take place at equal or nearly equal intervals. The inlets of the several pumps which compose this apparatus are connected by the pipe W, which is attached to the suction-box X of the paper-making machine. The outlet-pipes are also connected with a pipe, Y, from which the pulp which may pass through the wire-cloth Z into the suction-box and thence through the pumps may be collected.

The pumps, when in use, operate better by having a fluid seal of water or oil placed around the plunger, and it is well to have the barrels either elongated or flared at the top, so as to avoid wasting the water or oil when the plungers rise to the top of their stroke.

I am aware that rotary pumps have been

used heretofore to exhaust from paper-making machines, and also that plunger-pumps have been made with oblique clack-valves and operated from a crank-shaft for other purposes. Both of these I distinctly disclaim; but

What I do claim as my invention is—

1. The plunger B, composed of the parts J, K, L, M, N, O, and P, as described.

2. The channel-way D E and valves F and G, arranged in relation thereto, as drawn and described.

W. BARNET LE VAN.

Witnesses:

S. LLOYD WIEGAND,
JOHN HABIG.