

2 Sheets--Sheet 1.
J. K. SIMPSON & S. N. DRAKE.

Steam Vacuum-Pumps.

No. 134,568.

Patented Jan. 7, 1873.

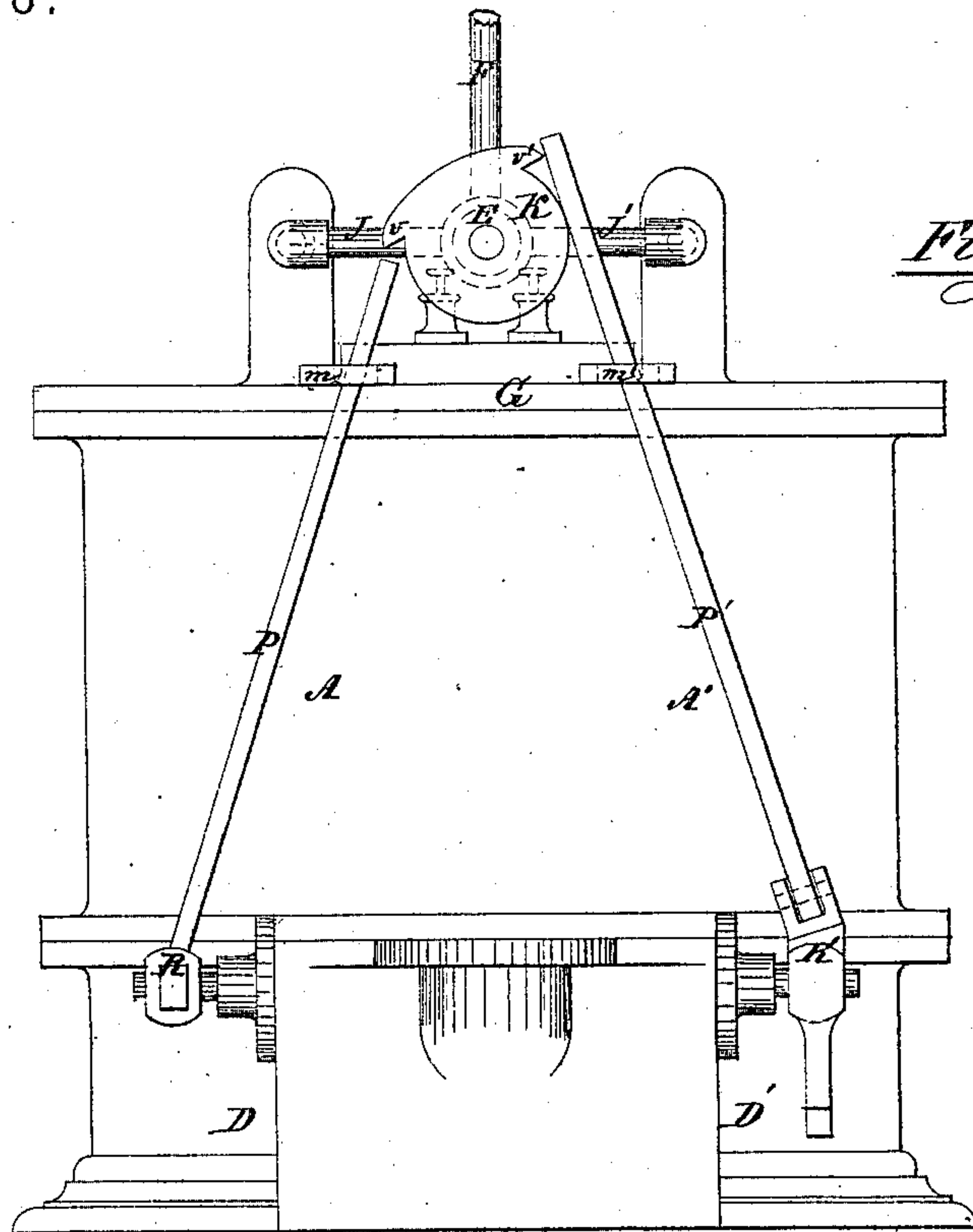


Fig. I.

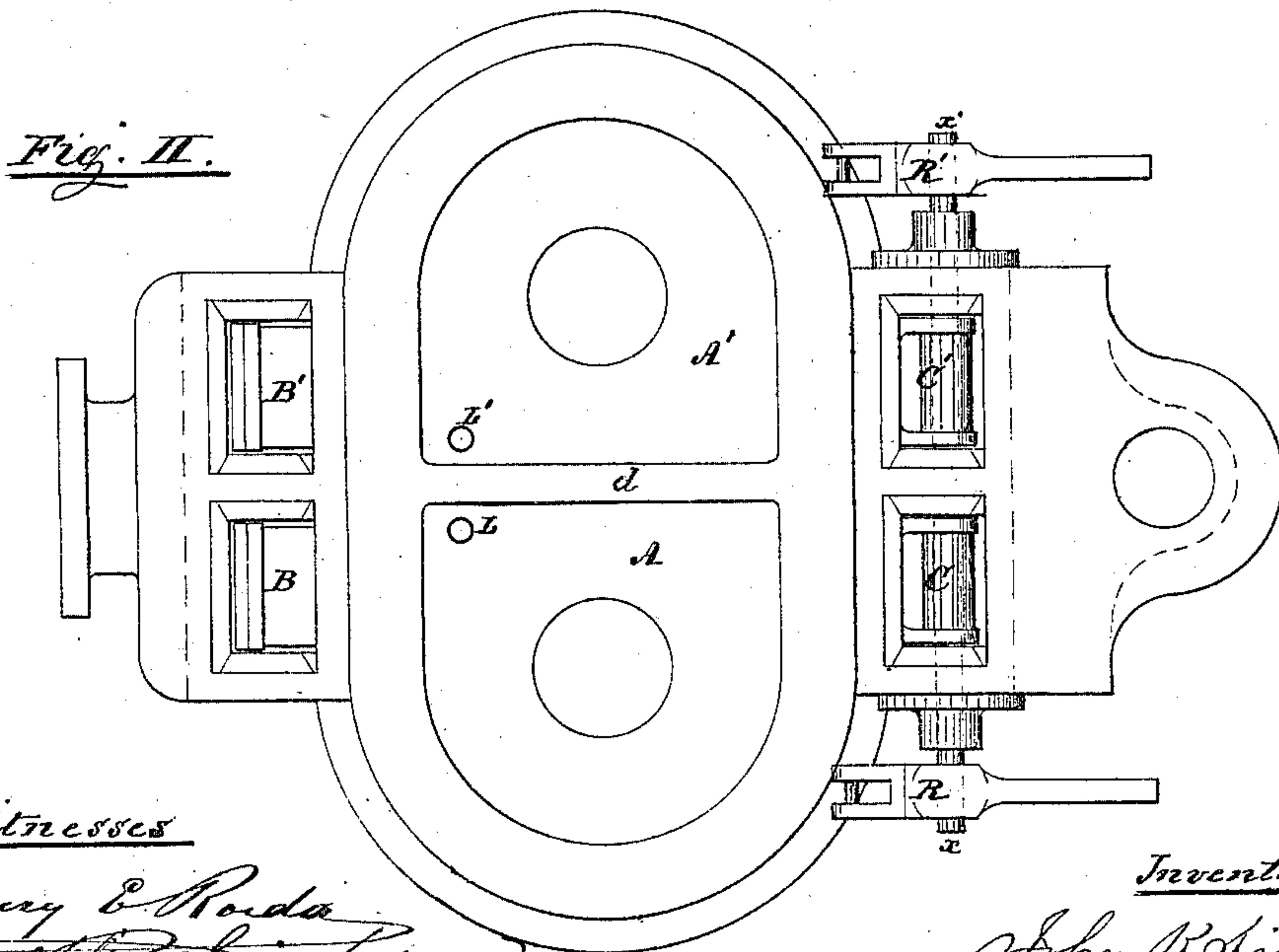


Fig. II.

Witnesses

Henry C. Ronda
Ralph Simpson

Inventors.

John K. Simpson
Samuel N. Drake

J. K. SIMPSON & S. N. DRAKE.

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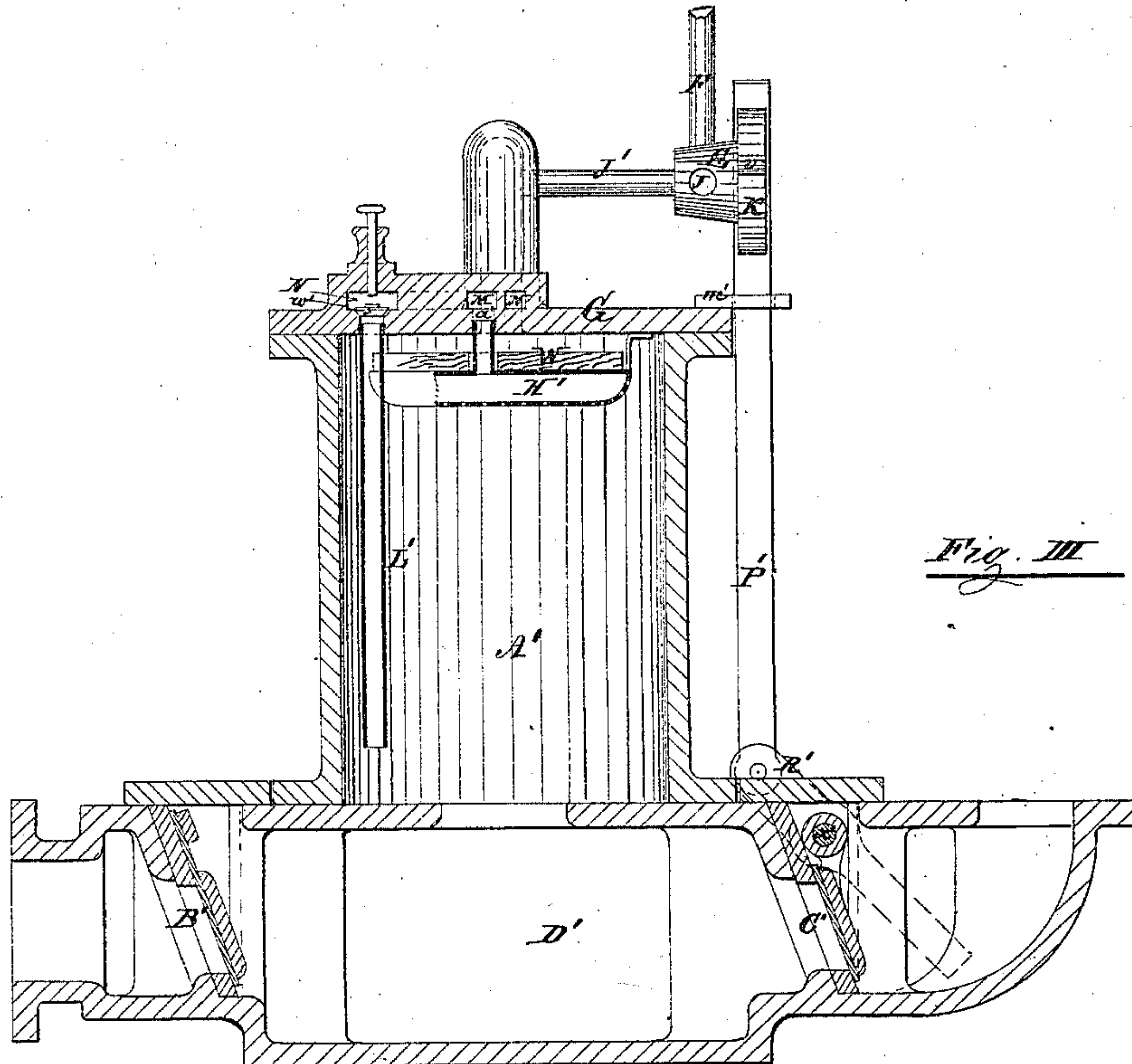


Fig. III

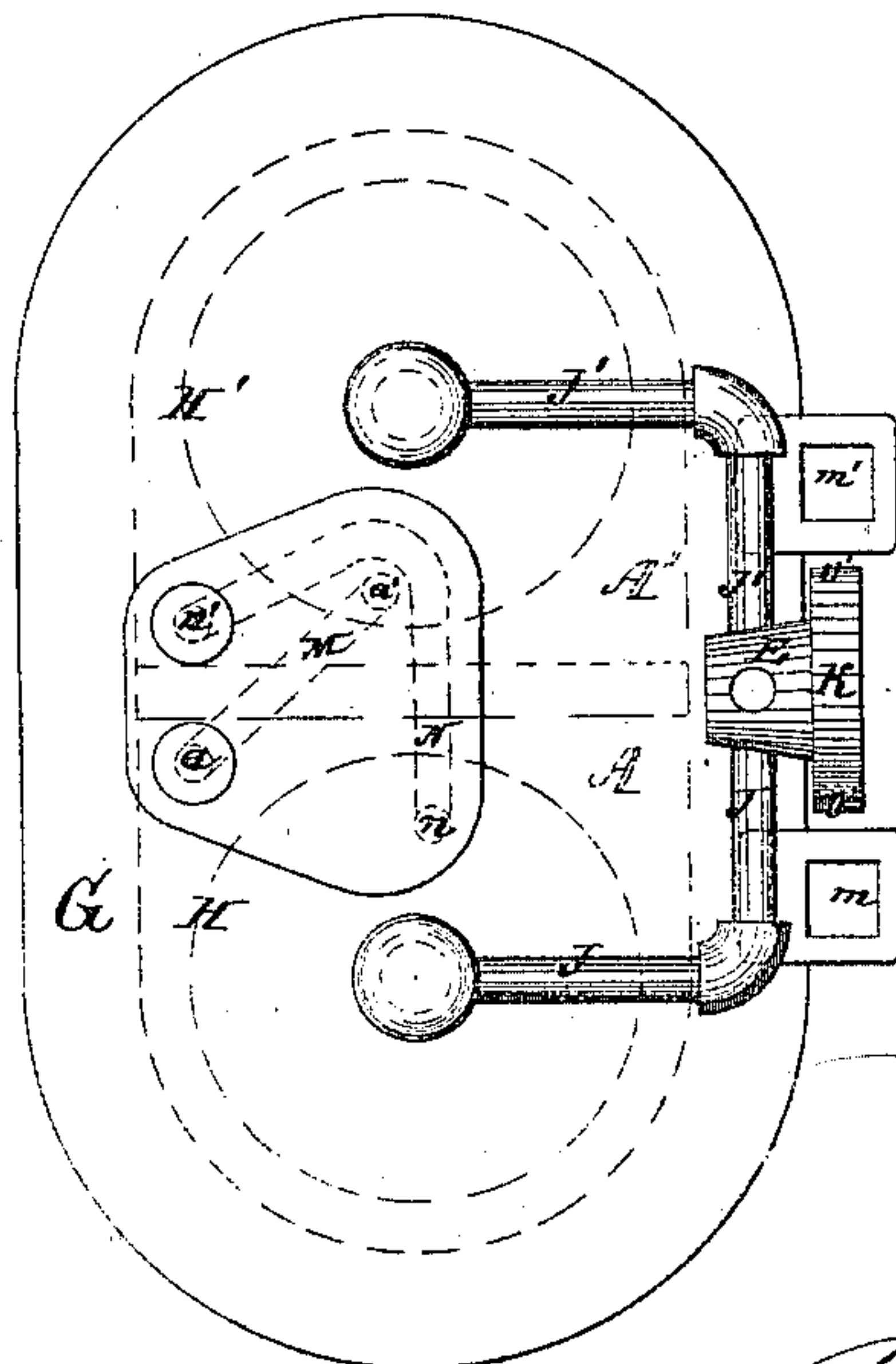


Fig. IV.

Witnesses.

Henry & Rader
Ralph Simpson

Inventors.

John W. Simpson
 Isaac N. Drake

UNITED STATES PATENT OFFICE.

JOHN K. SIMPSON AND SIMEON N. DRAKE, OF NEW YORK, N. Y., ASSIGNORS OF FOUR-SIXTHS THEIR RIGHT TO HENRY KLENEN AND MARTIN KLENEN, OF SAME PLACE, FREDERICK KLENEN, OF HOBOKEN, NEW JERSEY, AND JOHN N. THOMAS, OF MAYSVILLE, KENTUCKY.

IMPROVEMENT IN STEAM VACUUM-PUMPS.

Specification forming part of Letters Patent No. 134,568, dated January 7, 1873.

To all whom it may concern:

Be it known that we, JOHN K. SIMPSON and SIMEON N. DRAKE, both of the city of New York, in the State of New York, have invented a new and useful Improvement in Automatic Steam Vacuum-Pumps, of which the following is a specification:

This invention relates to the mechanism employed for operating the steam-valve by means of the discharge-valve in such a manner that the action of the discharge-valve of one chamber or pump will cause the steam to enter into the other chamber or pump, facilitating thereby the construction of a double-acting pump; and, further, this invention relates to the manner of arranging the injection-pipes so that water will be forced from the discharging-cylinder into the one refilling.

In the accompanying drawing, Figure I represents an outside front view of a vacuum-pump embodying our invention; Fig. II is a top view of the same with the cylinder-heads and valve-bonnets removed; Fig. III is a cross-section of the same; and Fig. IV is a top view of the cylinder-head.

Similar letters represent similar parts in all the figures.

A A' are two chambers or pumps, which are, in small pumps, cast together, separated only by a partition, *d*, but which may be made separate and placed side by side in larger pumps. B B' are the suction-valves, and C C' the discharge-valves, placed in the chambers D D' below the pump-chambers, and connected to their respective pump-chambers A or A'. E is a three-way steam-valve connecting with the boiler through the pipe F, and through the pipe J with the top of the cylinder A, and through the pipe J' with the top of the cylinder A'. Some little distance below the cover G chambers H H' are suspended in the pump-cylinders A A', having their lower sides or ends perforated. In the cover G, passages M N are made. The end *a'* of the passage M is connected through a pipe with the chamber H' in the cylinder A', and to the end *a* of said passage M is connected a pipe, L, projecting into the cylinder A, extending nearly to the bottom. The end *n* of

the passage N is connected through a pipe with the chamber H in the cylinder A, and to the end *n'* of said passage N is connected a pipe, L', projecting into the cylinder A'. On the upper ends of the pipes L and L' check-valves *w w'* are placed.

When the two pump-cylinders are made separate and placed some distance apart, a pipe may be attached on the outside of each cylinder, near the bottom, and connected through the cover with the suspended perforated chamber in the other cylinder.

Upon the spindle of the three-way steam-valve E a disk, K, is placed, provided with two projections, *v v'*, against which the ends of the rods P P' are made to work, for the purpose of turning the same, and consequently the steam-valve E. The lower ends of these rods P P' are attached to levers R R', fast on the ends of the spindles *x x'* of the discharge-valves C C', and the upper parts of said rods pass through suitable guides *m m'* attached to the cylinder-cover G. Upon the chambers H H' in the pump-cylinders plates of wood W are placed to prevent the steam entering the cylinders heating said chambers. When the steam has been admitted into the one cylinder A, the water in the same will be expelled through the discharge-valve C, the opening of which said valve C will move the rod P downward so as to bring its upper end below the projection *v* on the disk K. At the same time the water is being expelled out of the cylinder A a portion of it will pass into the pipe L, through the passage M, into the perforated chamber H' in the cylinder A', so as to condense the steam which has before acted in this cylinder A', causing the production of a vacuum in the same, and cause this cylinder A' to refill with water. As soon as the water in the cylinder A has been discharged the discharge-valve C will close, moving thereby the rod P upward so as to act against the projection *v* on the disk K, turning the same, and consequently the steam-valve E, so as to shut off the steam from the cylinder A, and cause the steam to enter the cylinder A', so as to expel the water out of the same, forcing at the same time suf-

ficient water through the pipe L', passage N, and chamber H into the cylinder A to condense the steam which has before acted in said cylinder A, and causing the production of a vacuum in the same, capable of being again refilled with water. The opening of the discharge-valve C' will move the end of the rod P' below the projection v' on the disk K, ready to operate said disk, and consequently the steam-valve E, as soon as this discharge-valve C' closes, so as to change the direction of the steam, and then cause the same to be shut off from the cylinder A' and to enter the cylinder A.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The arrangement of the rods P P' connected to the discharge-valve C C' in combination with a disk, K, operating the steam-valve E, substantially as and for the purpose specified.

2. The combination of two cylinders or chambers, A A', with pipes L I', passages M N, and perforated chambers H H', substantially in the manner and for the purpose hereinbefore described.

JOHN K. SIMPSON.
SIMEON N. DRAKE.

Witnesses:

HENRY E. ROEDER,
RALPH SIMPSON.