

(No Model.)

J. A. GROSHON.

AIR PUMP FOR STEAM CONDENSERS.

No. 309,942.

Patented Dec. 30, 1884.

Fig. 2.

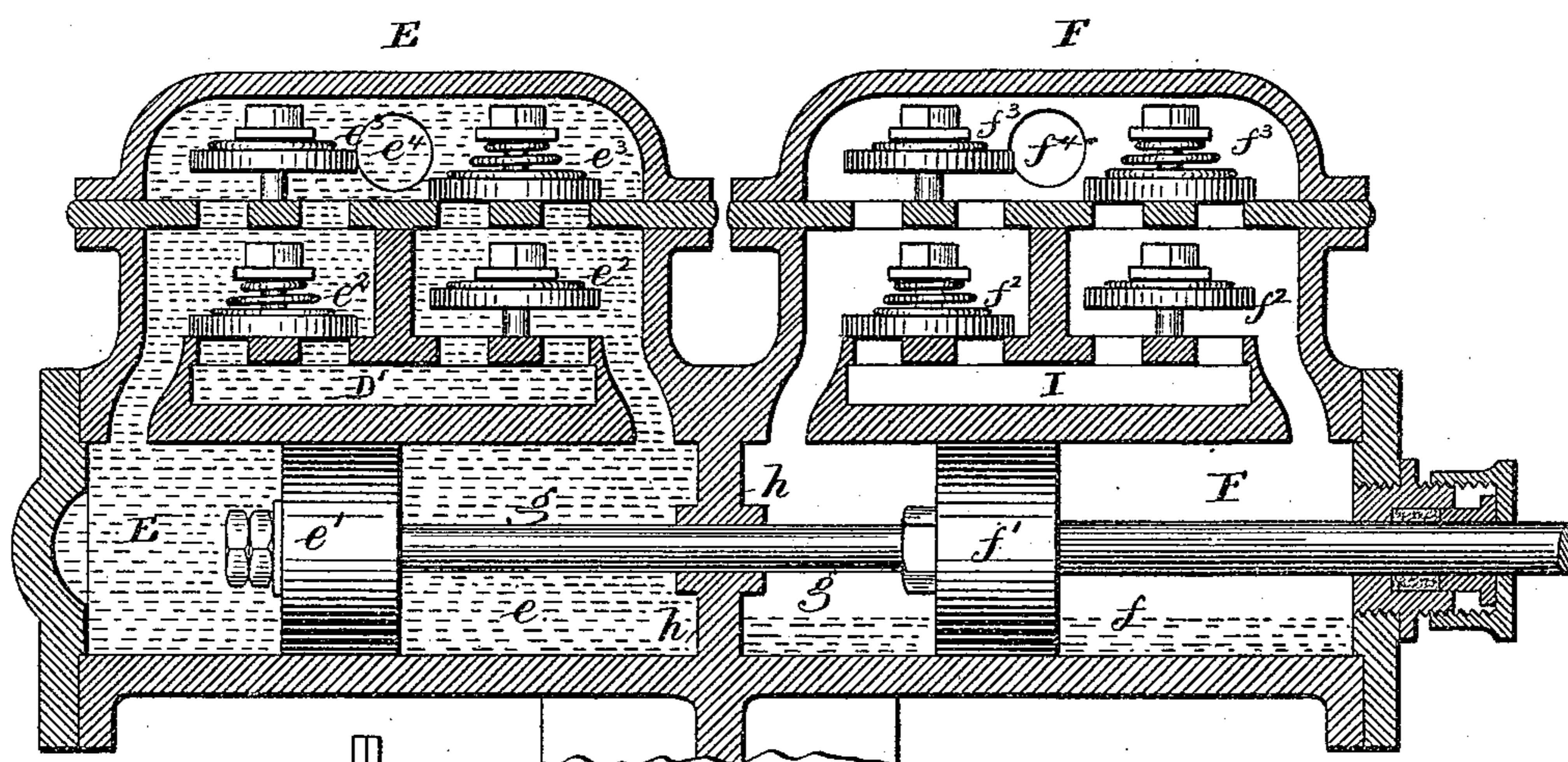
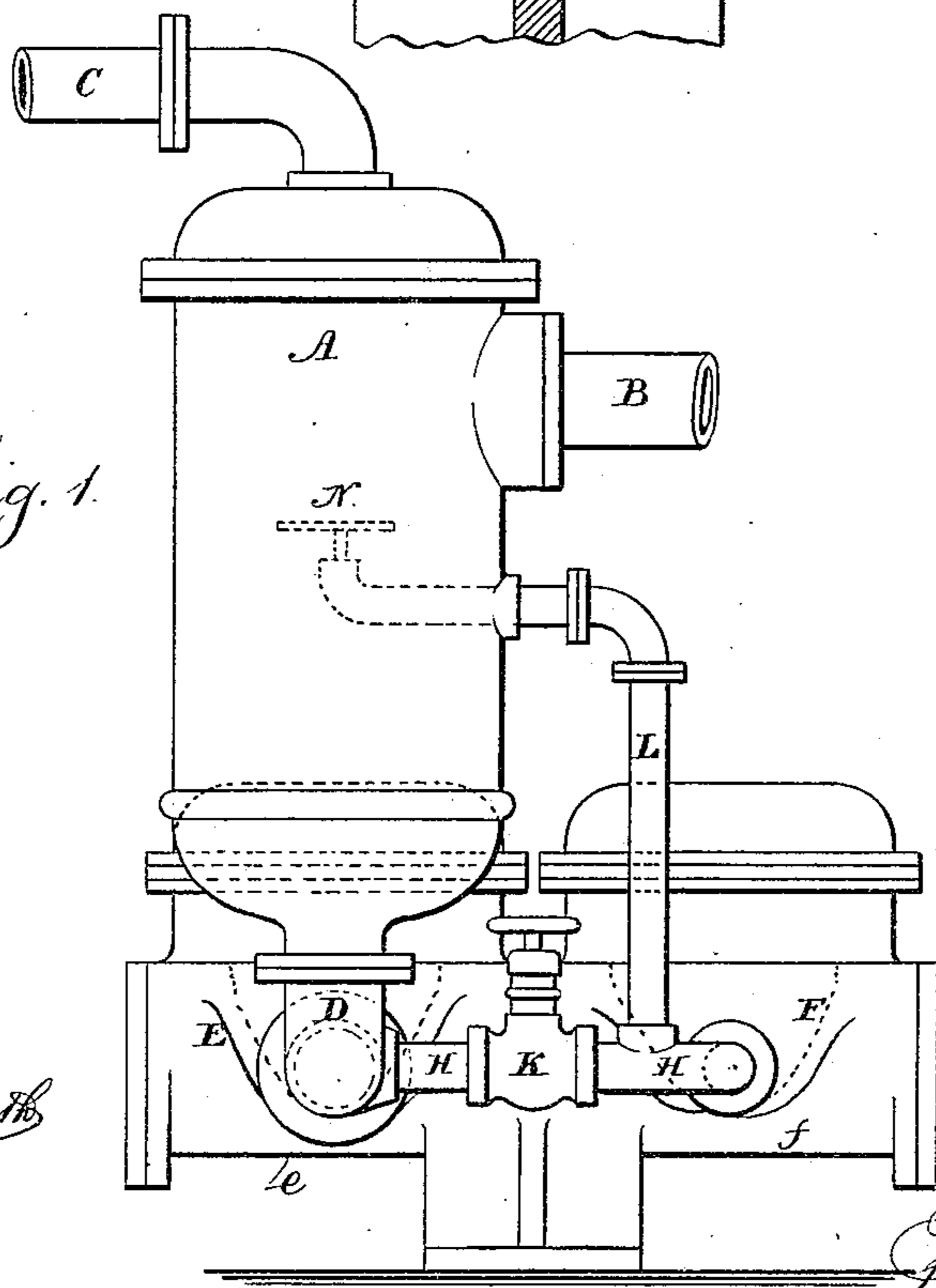


Fig. 1.



Witness

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JOHN A. GROSHON, OF NEW YORK, N. Y.

AIR-PUMP FOR STEAM-CONDENSERS.

SPECIFICATION forming part of Letters Patent No. 309,942, dated December 30, 1884.

Application filed May 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. GROSHON, of the city and State of New York, have invented an Improvement in Air-Pumps for Steam-Condensers, of which the following is a specification.

Horizontal direct-acting steam-pumps are extensively used for removing water from condensers and for maintaining a vacuum therein. In these pumps it is usual to draw the water in behind the piston as the latter is moved along in the cylinder, and the capacity of the pump is always considerably more than the volume of water, in order that the air and vapors may also be drawn into the pump for the purpose of promoting a vacuum in the condenser. When the contents of the cylinder are being ejected by the piston on the return-stroke, the air and vapors are elastic, and the steam-engine moves the pump-piston easily until the water has been moved by the piston and fills the passages and the space between the cylinder-head and piston. There is usually at this point of the stroke a concussion or a pause, as the water cannot be compressed, and so soon as the accumulation of force in the steam-cylinder is sufficient to eject the water, the movement of the piston is resumed.

My invention is made for preventing any concussion, hammering, or jar in the action of the pump in freeing the condenser of both air and water; and my said invention relates to two connected pistons within two cylinders, (or within the prolongation of one cylinder,) and pipes and cocks, so that one part of the pump will act to carry away the water from the condenser, and the same will fill entirely, or nearly so, each stroke of the piston. The other cylinder and piston will remove the air and vapors from the condenser, and only sufficient water is admitted into this second cylinder to cause the air to be properly acted upon and expelled as the water fills the passages and spaces at the end of the stroke.

In the drawings, Figure 1 is an elevation of the condenser and pump, and Fig. 2 is a longitudinal section of the double pump.

The condenser A is of any desired character. B is the engine-exhaust pipe, and C is the water-injection pipe. The leg D connects the

lower end of the condenser with the water-portion of the double pump. The portion E of the double pump is for water, and the portion F is for air and vapors. The cylinders *e* and *f* are preferably in one, the piston-rod *g* passing through the partition *h*, that separates the portions E F of the double pump; but these cylinders may be separated, if desired. The pistons *e'* *f'* are in the respective cylinders upon the piston-rod *g*. The suction-valves *e*² *f*² and discharge-valves *e*³ *f*³ are of any desired or ordinary character, and *e*⁴ *f*⁴ are the discharge-pipes. The leg D opens into the suction-way D' of the pump E, and there is a pipe H, from the lower part of the leg D to the suction-way I of the pump F; and in this pipe H there is a cock or valve, K. There is also a pipe, L, from the condenser (or the upper part of the leg D) to the pipe H, and in this there may be a deflector at N to prevent water passing into the pipe L.

The operation of these pumps, when the pistons are reciprocated by suitable power, is as follows: The cock K is to be opened sufficiently to allow a small amount of water to flow into the pump F, in order that sufficient water may be present to expel the air from the passage-ways and spaces at the ends of the strokes. The main body of water runs from the leg D into the pump E, and this volume will usually be sufficient to fill said pump E; hence the same will act uniformly and steadily. The pump F will draw air and vapors from the condenser by the pipes L H, and act as an air-pump to promote the vacuum in the condenser. If at any time the volume of water is in excess of the capacity of the pump E, such water will pass by L H to the pump F, and the condenser will be kept free.

By this improvement the pump is made much more regular and uniform in its action, and a better vacuum obtained, because the passage-way from the condenser to the pump F is seldom obstructed by water.

I claim as my invention—

1. The two-part pumps E F, having separate suction and discharge valves and suction-ways, in combination with a condenser having a water-leg, D, and two connecting-pipes, one from the lower part of the water-leg of the

part E of the pump, the other from the steam-space of the condenser to the part F of the pump, substantially as set forth.

2. The combination, with the two-part
5 pumps E F, of the pipe or leg D, connecting to the pump E, the pipe H and cock K, connecting the pipe D to the suction-way of the pump F, and the pipe L, connecting from such

pump F to the condenser, substantially as set forth.

Signed by me this 1st day of May, A. D. 1884.

JOHN A. GROSHON.

Witnesses:

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