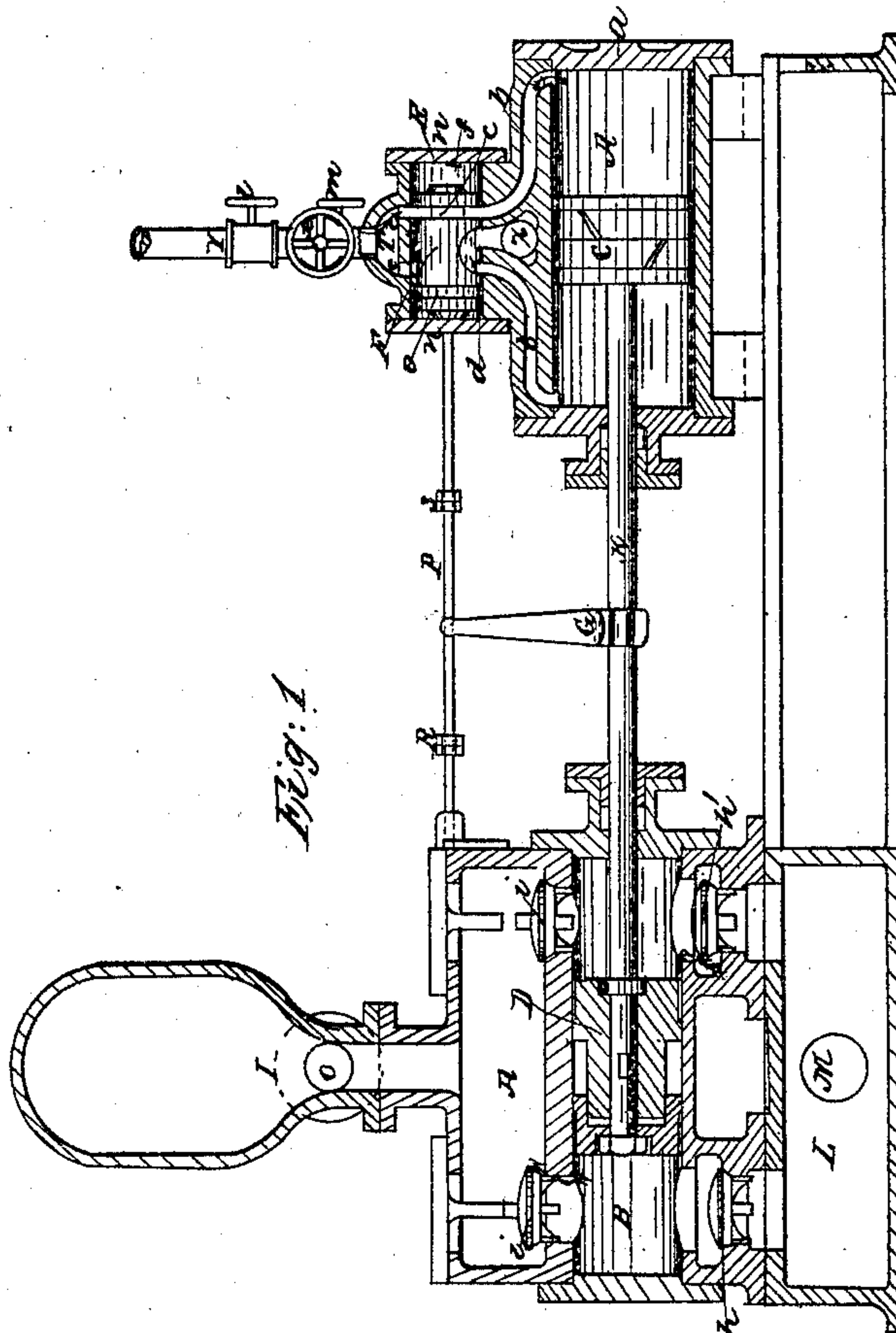
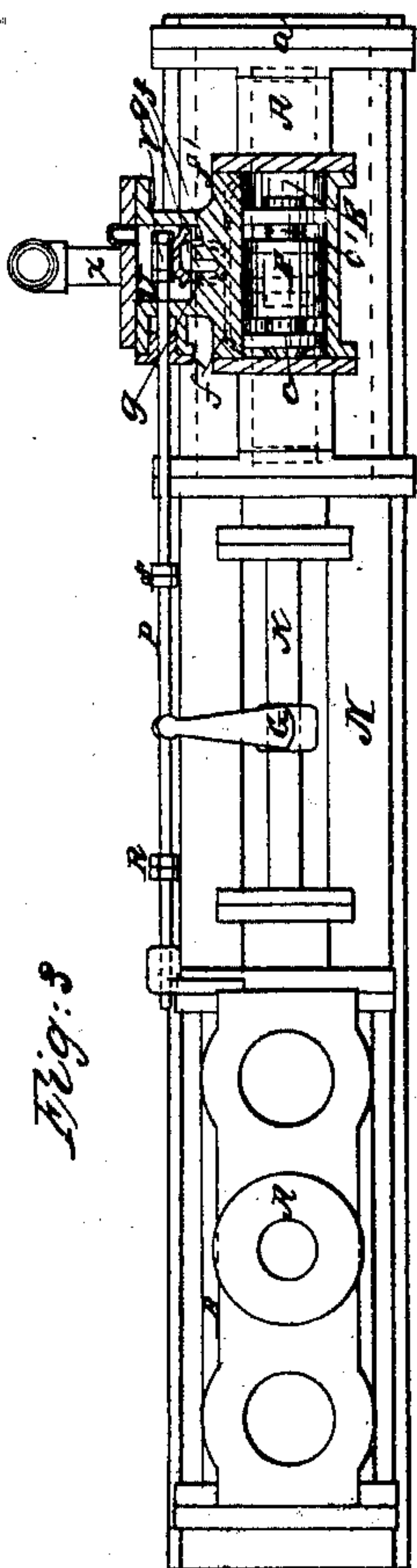
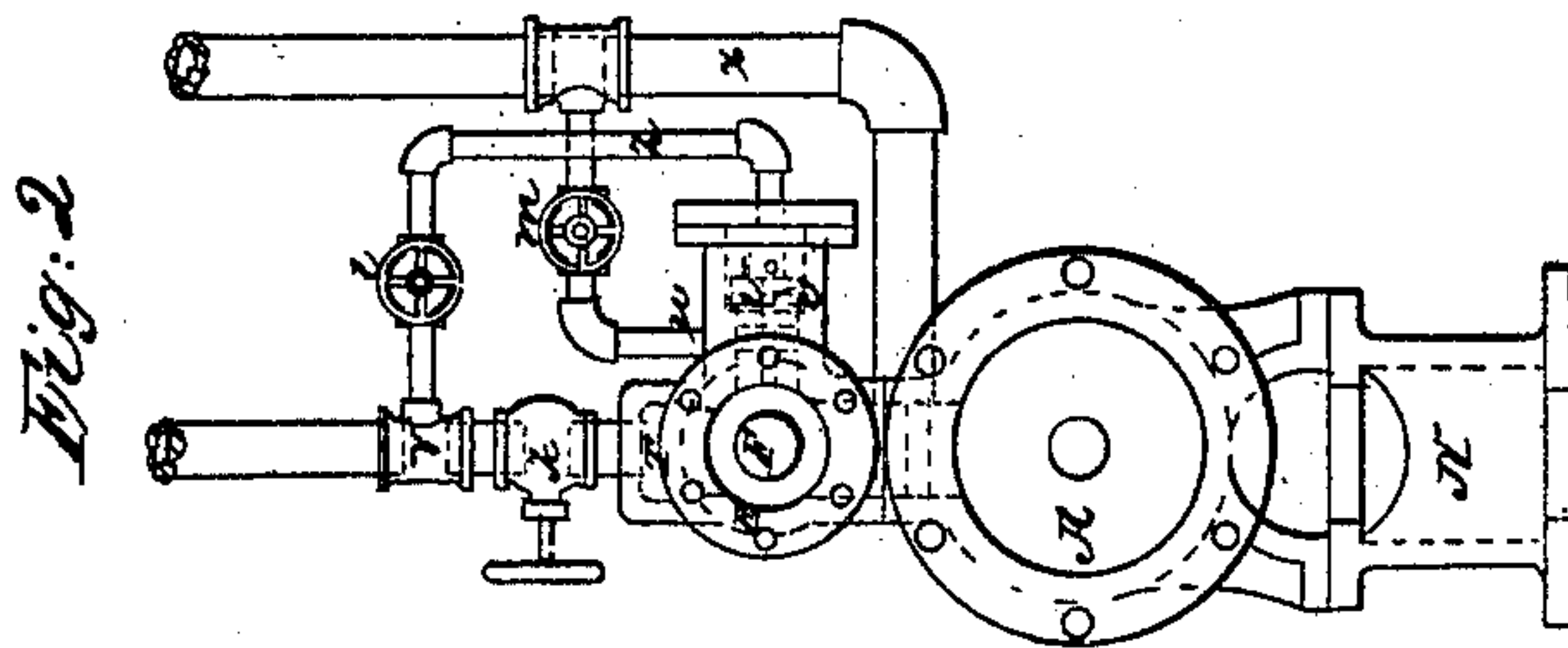


J. B. POTTMEYER.
STEAM PUMP,

No. 62,360.

Patented Feb. 26, 1867.



Witnesses:
Conrad Limpert
Charles Ridgway

Inventor.
J. B. Pottmeyer.

United States Patent Office.

JOSEPH B. POTTMEYER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO
HIMSELF AND NICHOLAS WINTER, OF THE SAME PLACE.

Letters Patent No. 62,360, dated February 26, 1867.

IMPROVEMENT IN STEAM PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH B. POTTMEYER, of Pittsburg, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful arrangement of Steam Pump; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical section of my improved steam pump through centre of cylinder A, pump chamber B, &c.

Figure 2 is an end elevation of the steam cylinder A, bed-plate N, &c., with cylinder head *a*, steam-chest lid *n*, piston C, &c., removed, and showing steam and exhaust connections.

Figure 3 is a plan of the steam pump with a cross-section through centre of steam chest E, auxiliary steam chest U, and valve V.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, figs. 1, 2, 3, is the steam cylinder; B, figs. 1 and 3, is the pump-chamber; C, fig. 1, is the steam piston; D, fig. 1, is the pump-plunger and follower, projecting at both ends, so as to travel close by the valves *h h'* and *i i'*, and to fill up the entire space at each end of the pump at every stroke; E, figs. 1, 2, and 3, is the main steam chest enclosing the valve F; F, figs. 1 and 3, is the main steam valve in chest E, with the steam passages *c c'*, passing either through or around the same, and with the exhaust passage *d*; G, figs. 1 and 3, is the arm or knocker attached to the piston-rod K, and which moves the valve-stem P; H, figs. 1 and 3, is the discharge-chamber attached to the pump B, and containing the valves *i i'*; I, fig. 1, is the air-chamber attached to H; K, figs. 1 and 3, is the piston-rod which connects the piston C with the pump-plunger D; L, fig. 1, is the receiving-chamber for the pump; M, fig. 1, is the supply-opening to chamber L; N, figs. 1, 2, and 3, is the bed-plate to cylinder A and pump B; O, fig. 1, is the discharge-opening from air-vessel I; P, figs. 1 and 3, is the stem attached to the valve V; R and S, figs. 1 and 3, are nuts or stops on the valve-stem P, and moved by the arm G; T, fig. 1, is an extra steam chamber attached to E; U, figs. 2 and 3, is an auxiliary steam chest containing the valve V; V, fig. 3, is the auxiliary valve in chest U, and which admits and discharges to and from the chest E the steam used in moving valve F; W, fig. 2, is the exhaust pipe from the chest U; X, figs. 1, 2, and 3, is the main exhaust from the cylinder A; Y, figs. 1 and 2, is the main steam pipe which supplies the steam cylinder A, through chests T and E; Z, figs. 2 and 3, is the steam pipe which supplies the chest U. *a*, figs. 1 and 3, is the head to the cylinder A; *b b'*, fig. 1, are the steam passages in cylinder A; *c c'*, figs. 1 and 3, are steam passages around or through valve F; *d*, fig. 1, is an exhaust passage in valve F; *e e'*, fig. 1, are ports between chamber T and chest E; *f f'**, fig. 3, are steam passages from the auxiliary chest U to the main chest E, crossing each other back of the exhaust port *g*; *g*, fig. 3, is the exhaust opening from the chest U; *h h'*, fig. 1, are the receiving valves to the pump B, set as close as practicable to the bore of chamber; *i i'*, fig. 1, are the discharge valves from the pump B to the chest H, also set close to bore of pump; *k*, figs. 1 and 2, is the valve or cock, admitting steam into the chamber T through pipe Y; *l*, figs. 1 and 2, is the valve admitting steam into U through Z; *m*, figs. 1 and 2, is a valve or cock which regulates the escape of the exhaust steam from the chest E; *n n'*, figs. 1 and 3, are covers for the steam chest E.

The operations of my improved steam pump are substantially as follows: The exhaust valve *m* being open, the valves *l* and *k* are next opened for the admission of steam. The steam from the pipe Y passes into the steam chamber T, and then through the port *e'* in the steam chest E, the steam passage *c'* in the valve F, and through the port *b'* into the cylinder A. The piston C then begins to move forward, and, through the piston-rod K, communicates a similar motion to the plunger D in the pump B. As this plunger advances, it forms a vacuum in the end of the pump, from which the plunger is receding, which causes the valve *h'* to lift, and draws into the pump the water, oil, or other liquids contained in the receiving-chamber L; at the same time the pressure on the other side of the plunger causes the discharge-valve *i* to open and discharge the contents of this end of the pump into the chamber H. By the peculiarities of the construction of the plunger D, and

* The steam passages *f f'*, fig. 3, are shown by red and blue dotted lines.

the position of the receiving-valves h h' , and discharge-valves i i' , when the plunger D is at the end of the stroke, the space in the pump-chamber is almost entirely filled by the plunger, thus allowing little or no room for the accumulation of air or vapor. When the piston A and plunger D are nearly at the end of the stroke, the arm G, on the piston-rod K, strikes the stop R on the valve-stem P, and carries forward the stem, and the valve V, thus closing the port f from the pressure of the steam in the chest U, and opening the port f' which admits a jet of steam into the chest E, at the same time that the exhaust steam from the other end of the chest E is being discharged through the port f into the pipe W. The valve F is thus forced back by the pressure of steam, until the passage c comes in line with the ports e and b , closing the port e' , and allowing the steam in the cylinder to escape into the exhaust pipe x , through the port b' , whilst the live steam is admitted into the other end of the cylinder A through the port b . The engine is thus reversed and the motion is continued indefinitely, at either a slow or rapid rate.

The speed and efficiency of my improved steam pump is regulated in the following manner: Having separate steam connections to the two steam chests E and U, the valve l may be wide open in order to secure the prompt and positive motion of the valve F, whilst the valve k may be so adjusted as to run the engine at a slow rate of speed, or in fact at any required speed, without affecting the working of the main valve F. The valve m in the exhaust W may be also adjusted so as to affect the working of the valve F, by either being wide open or partially closed, thus checking the exhaust, and using as a cushion the steam which has been before used in moving the valve, and thus preventing the jar which would otherwise occur at each movement of the valve F.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the plug valve F, with its steam passages c and c' , and its exhaust channel d , substantially as described and for the purpose as set forth.
2. The arrangement of the valve V, and auxiliary valve F, as described and for the purpose set forth.
3. The arrangement of the throttle m , with reference to the steam chest E and valve F, in the manner and for the purpose as set forth.

JOS. B. POTTMEYER.

Witnesses:

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