

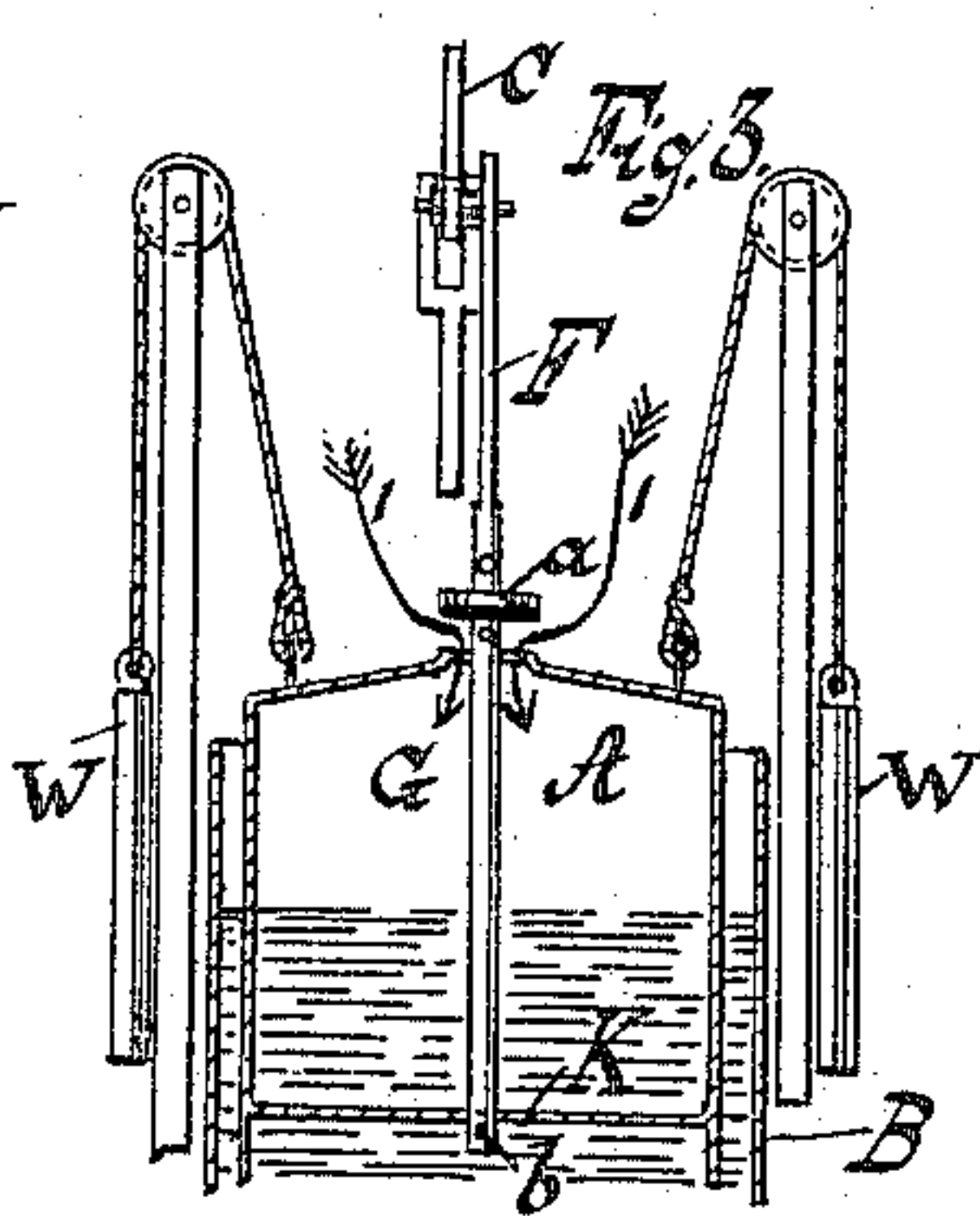
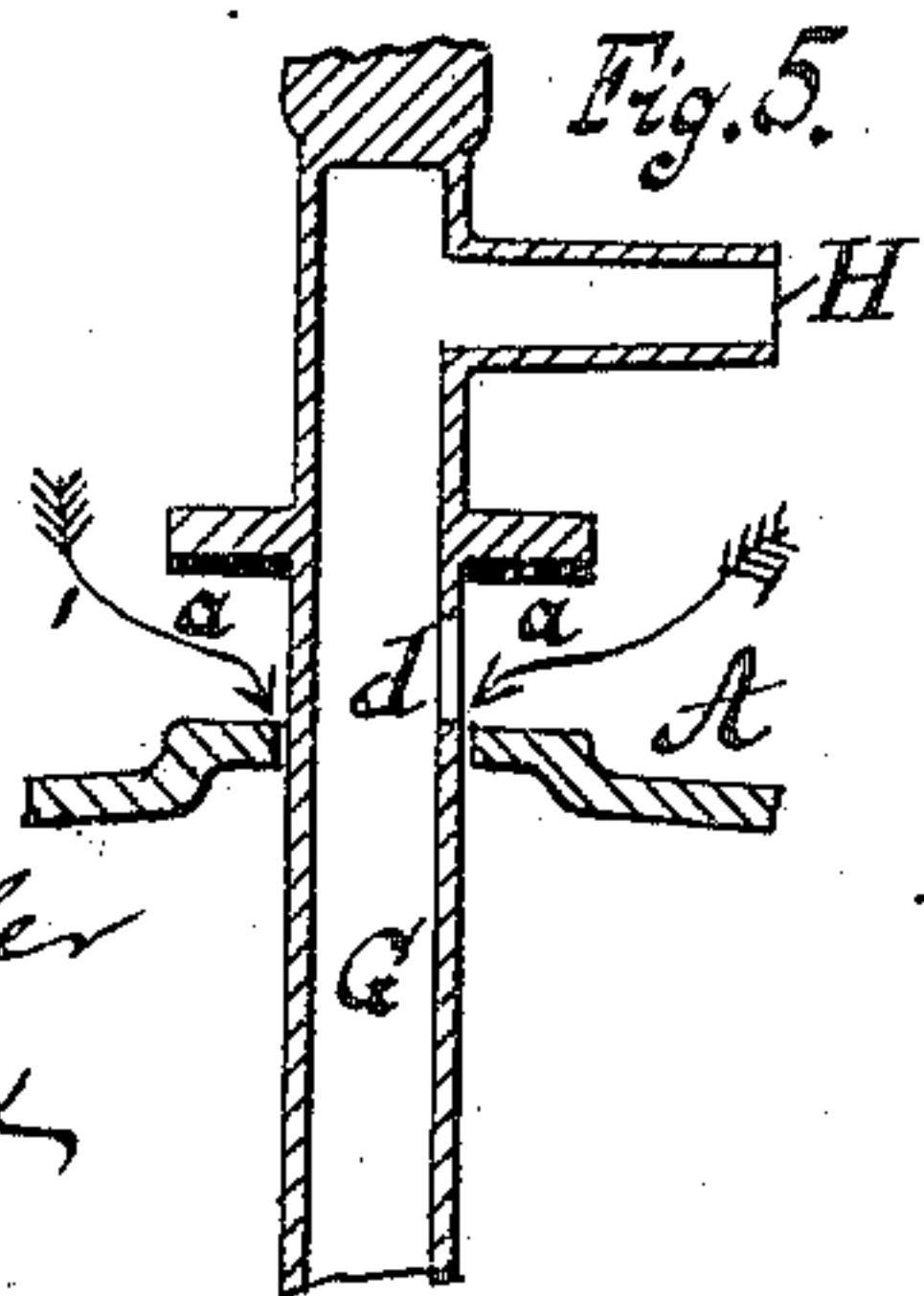
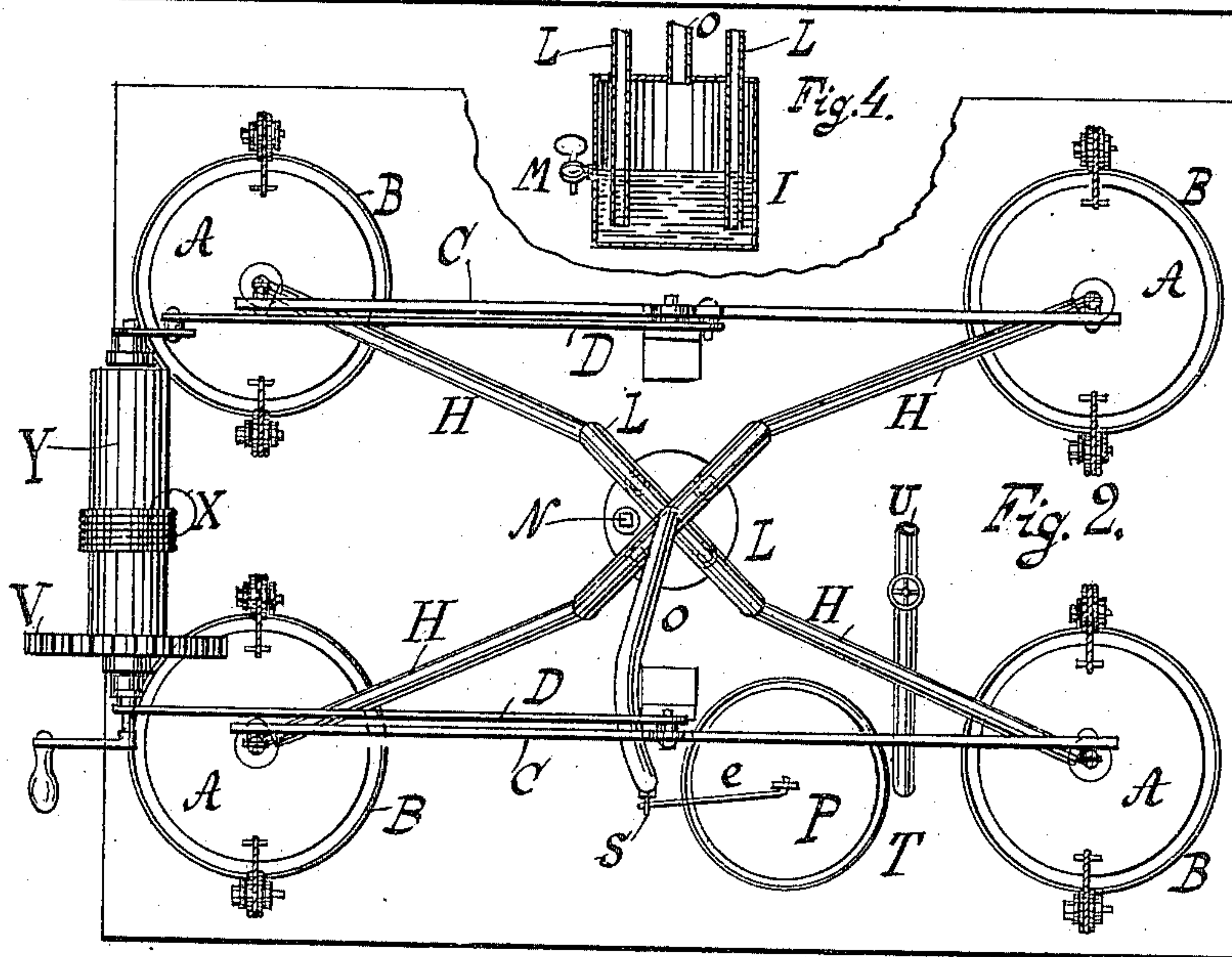
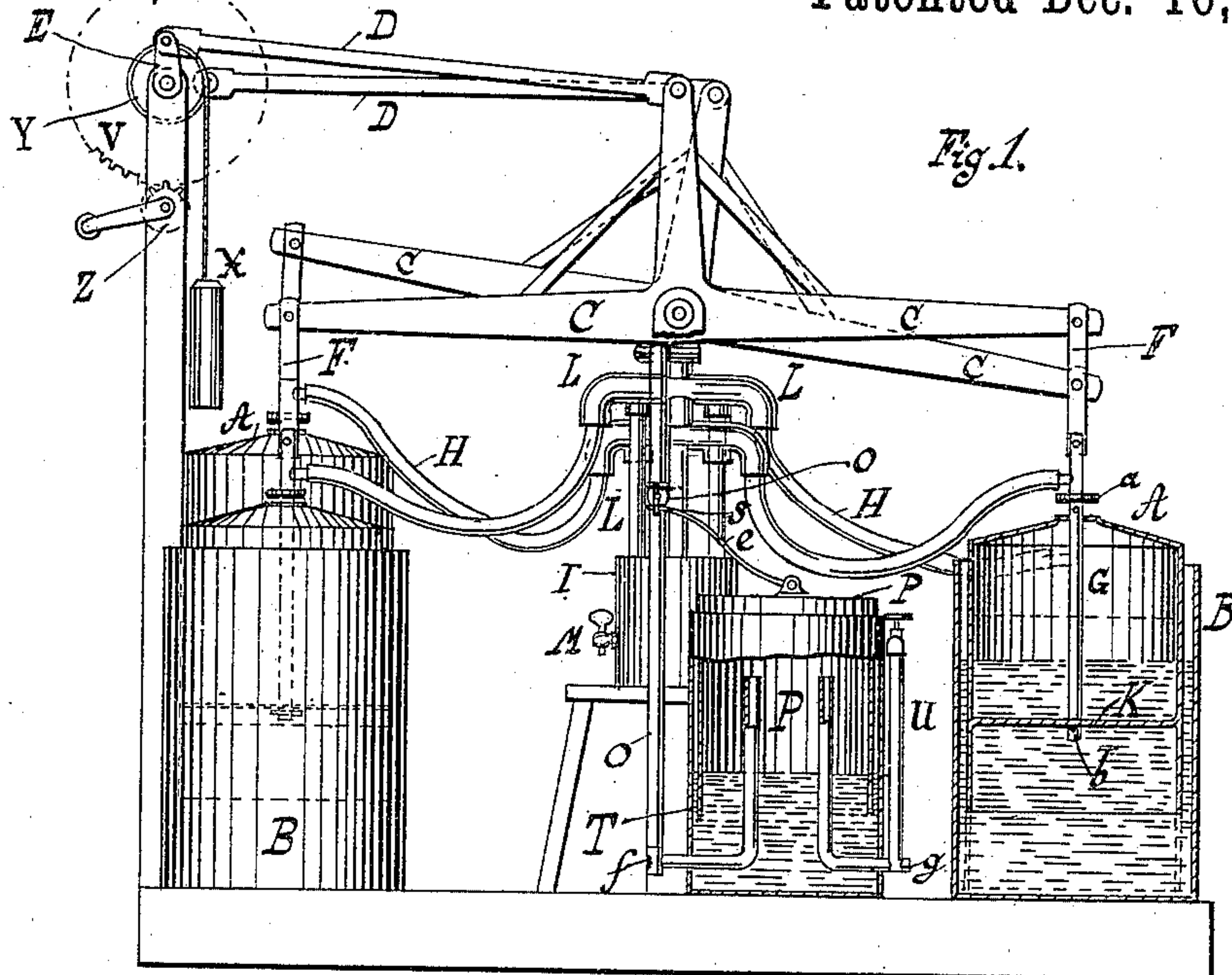
(No Model.)

S. HANFORD.

PUMP.

No. 309,347.

Patented Dec. 16, 1884.



WITNESSES:

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UNITED STATES PATENT OFFICE.

SAMUEL HANFORD, OF BINGHAMTON, NEW YORK.

PUMP.

SPECIFICATION forming part of Letters Patent No. 309,347, dated December 16, 1884.

Application filed March 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HANFORD, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented new and useful Improvements in Pumps, of which the following is a specification.

This invention has for its object to provide novel, efficient, and economical pumping apparatus, which is especially useful in connection with carburetors to force air through the same.

To these ends the invention consists in the combination of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 represents a side elevation, partly in section. Fig. 2 is a plan view. Fig. 3 is a vertical central section of a forcing-cylinder with its contiguous parts. Fig. 4 is a vertical central section of the check-valve. Fig. 5 is a detached view, enlarged, of an outlet-tube of a forcing-cylinder.

Similar letters indicate corresponding parts.

In the drawings, the letters A designate pumping-cylinders or cups, several being employed to increase the capacity of the apparatus. These cylinders A are surrounded by tanks B, filled or partly filled with water or other suitable liquid to form an air or gas tight joint. The cylinders A may be nearly balanced by weights or springs W, Fig. 3. This part of the apparatus thus far described bears some resemblance to the holder or receiver in gas-works. The cylinders A are suspended from walking-beams C, to which a reciprocating motion is imparted by pitmen D, cranks E, and a weight or spring. Any suitable motor—as, for example, clock-work, steam-power, or other force—may be used to operate the walking-beams. The motor in the drawings is a weight, X, attached to a rope wound on a drum, Y, and which can be wound up by a crank and pinion, Z, gearing into the toothed wheel V. By a simple lateral motion the pinion Z can be slipped into gear or out of gear with the toothed wheel V. The rods F, by which the cylinders A are suspended from the walking-beams C, are shown as connected to tubes G. Each of said tubes G has at or near the upper end an outlet communicating with the tube or conduit H, leading to the

check-valve I. Said tubes G pass loosely through openings in the upper part or roof of the cylinders A, and when the connection F is pulled upward by the working-beam the tube G is raised until its flange *b* comes into contact with a steadying-brace, K, on the interior of the cylinder A, when the cylinder A is drawn upward with the tube G. The rubber or other elastic packing or washer, *a*, secured to the tube G, is thus drawn away from the top or roof of the cylinder A, and the cylinder A rises, the vacuum generated in its interior is filled with air flowing in through the opening in the roof of the cylinder A, through which opening the tube G passes, and which opening is made large enough to allow the air to enter the cylinder A about the tube G, in the direction of arrows 1, Figs. 3 and 5. When an end of a working-beam is descending, the rod F presses upon the tube G and forces the elastic washer *a* onto the roof of the cylinder A and over the opening therein, so as to close the same. The counter-weight W causes the cylinder A to descend with a certain resistance, whereby the elastic washer *a* is pressed so tightly onto the roof of the cylinder A as to close the opening therein. The air or gas in the cylinder is now, upon the descent of said cylinder A, compelled to enter the tube G through suitable opening, *d*, Fig. 5, provided for this purpose, and said air, entering the conduits H, is forced into the check-valve I through tubes or conduits L. These tubes or conduits L have their mouths placed beneath the surface of water or other suitable liquid in the check-valve I. A valve is thus formed, which prevents the air flowing back into the forcing-cylinder A. An inlet-opening, N, Fig. 2, which can be securely closed, allows the check-valve I to be filled, and a gage-cock, M, Figs. 1 and 4, is applied to adjust the level of the fluid in the check-valve I.

From the top of the check-valve I a tube or conduit, O, leads to a governor, P. The tubes O L are shown as braced against one another; but they have no communication except through the check-valve I.

The governor P may consist of a cylinder surrounded by a tank, T, filled or partly filled with water or other liquid, in the same manner as the forcing-cylinders A are surrounded by tanks B. As the governor P is gradu-

ally filled with air or gas it rises and closes the stop-cock S of the tube O, thus preventing further entrance of air or gas into the governor P. The governor P may connect with the stop-cock S by a lever or arm, *e*, which turns the stop-cock or valve as the governor P rises or falls; or any suitable arrangement may be applied for automatically operating the valve S.

If the motor consists of a weight or spring, the pressure of air or gas upon the closing of the cock S soon becomes so great in the check-valve I and forcing-cylinders A as to cause a stoppage of the working-beams C. The apparatus now remains at rest until the air in the governor P begins to be consumed, when said governor P descends, opening the stop-cock or valve S and allowing the motor to again operate the device upon the pressure diminishing in the cylinders A. The device is thus perfectly automatic. The tube O, leading into the governor P, and the exit-tube U, leading therefrom, pass up in the interior of the governor P, so that their mouths rest above the surface of the liquid in the tank T, in the same manner as the entrance and exit tubes of gas holders or reservoirs. (See Fig. 1.) Cleaning-openings *f g*, Fig. 1, may be provided at said tubes O U, near the bottom of the tank T, to allow cleaning and removing of obstructions, which cleaning-openings may be closed by plugs or suitable appliances.

My device will be found extremely useful, for example, in connection with such apparatus as carburetors, as it serves to force air through carburetors to impart to the air illuminating or heating properties.

When no air or gas is consumed, my device remains at rest; but upon the commencement of consumption of air or gas and the descent of the governor P, and consequent opening of the stop-cock or valve S, the device begins to operate, its operation being the more rapid in proportion to a greater consumption of air or gas.

As the device can be made of a compact form, and is readily taken apart and cleaned, and is not liable to get out of order, it furnishes

a convenient and economical apparatus. It should also be noticed that, if desired, the downward or expelling pressure of the governor P may be regulated by a weight or weights connecting with the governor P in a similar manner as the weights W connect with the forcing-cylinders A.

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

1. The combination, in a pumping apparatus, of the tank B, the reciprocating cylinder A within the tank, provided with an orifice in its top, and the vertically-movable tube G, passing through the opening in the top of the cylinder and provided with an opening, *d*, for communicating with the interior of the cylinder, and a valve, *a*, for opening and closing the orifice in the cylinder, substantially as described.

2. The combination, in a pumping apparatus, of the tank B, the cylinder A, reciprocating in the tank, and provided with an orifice in its top, the vertically-movable tube G, having an opening, *d*, for communicating with the interior of the cylinder, the valve *a* on the tube, for opening and closing the orifice in the cylinder, the check-valve I, and a conduit connecting the tube with the check-valve, for conducting the air from the interior of the cylinder to the check-valve, substantially as described.

3. The combination, in a pumping apparatus, of a tank, B, a cylinder reciprocating therein, an outlet-tube, G, communicating with the cylinder, and rising and falling therein, a valve, *a*, on the tube, a check-valve, I, in communication with the cylinder, and a governor, P, in communication with the check-valve, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

SAMUEL HANFORD. [L. S.]

Witnesses:

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