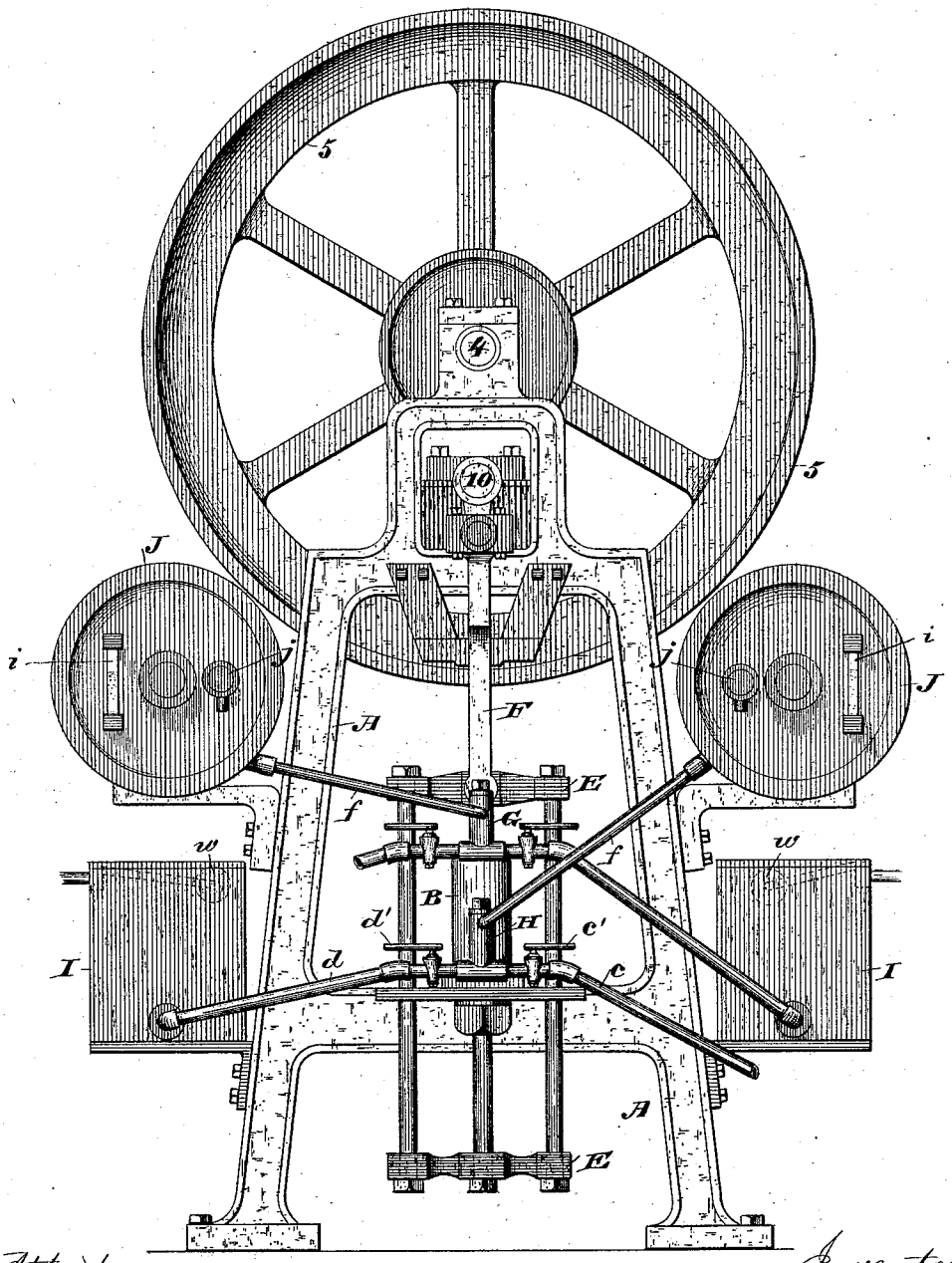
(No Model.) 4 Sheets—Sheet 1.

J. S. PEARSON.

APPARATUS FOR THE MANUFACTURE OF AERATED AND MINERAL WATERS.

No. 301,919. Patented July 15, 1884.

Fig 1.



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J. Walter Blandford

Inventor:

James S. Pearson
by Maulleu Bailey
his attorney

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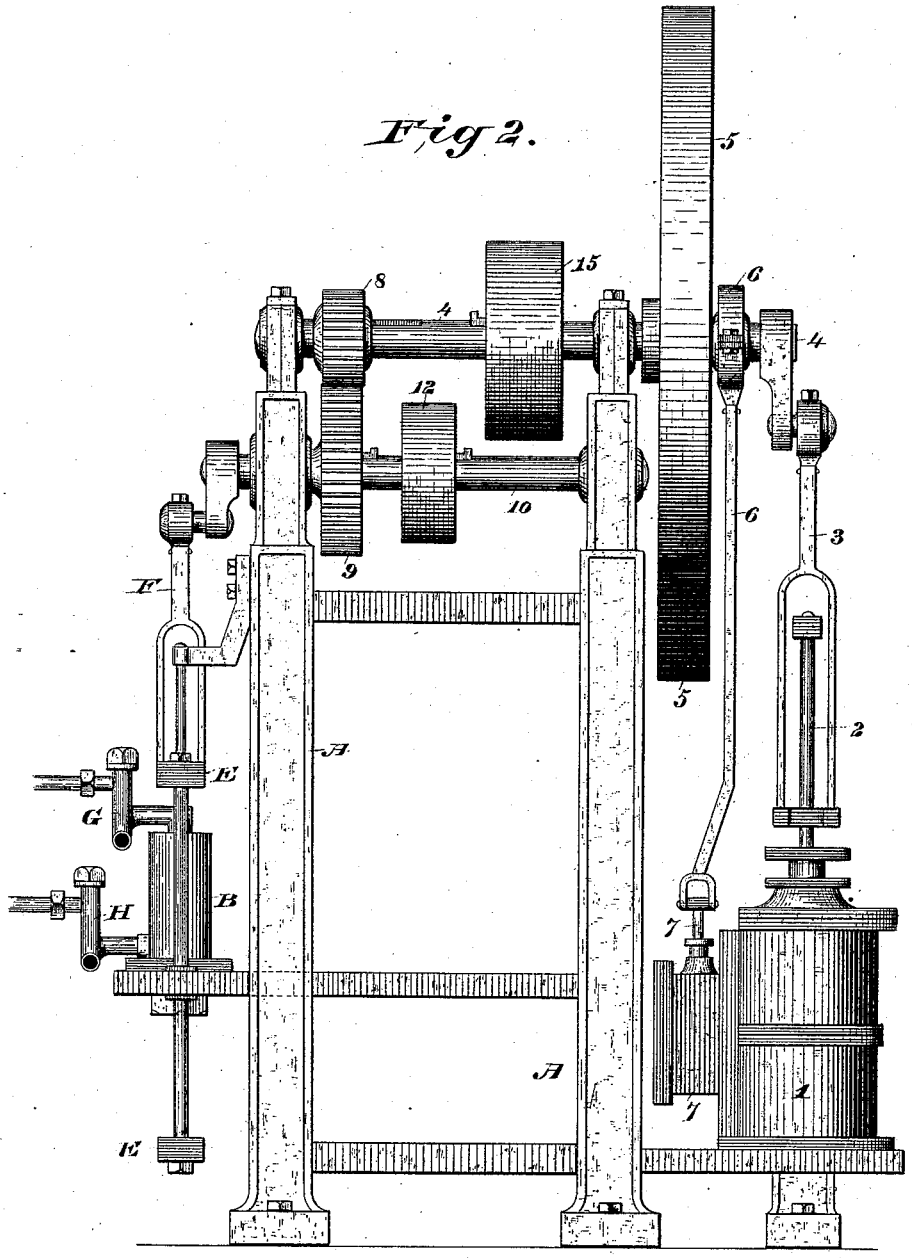
APPARATUS FOR THE MANUFACTURE OF AERATED AND MINERAL WATERS.

No. 301,919. Patented July 15, 1884.

Fig 2.



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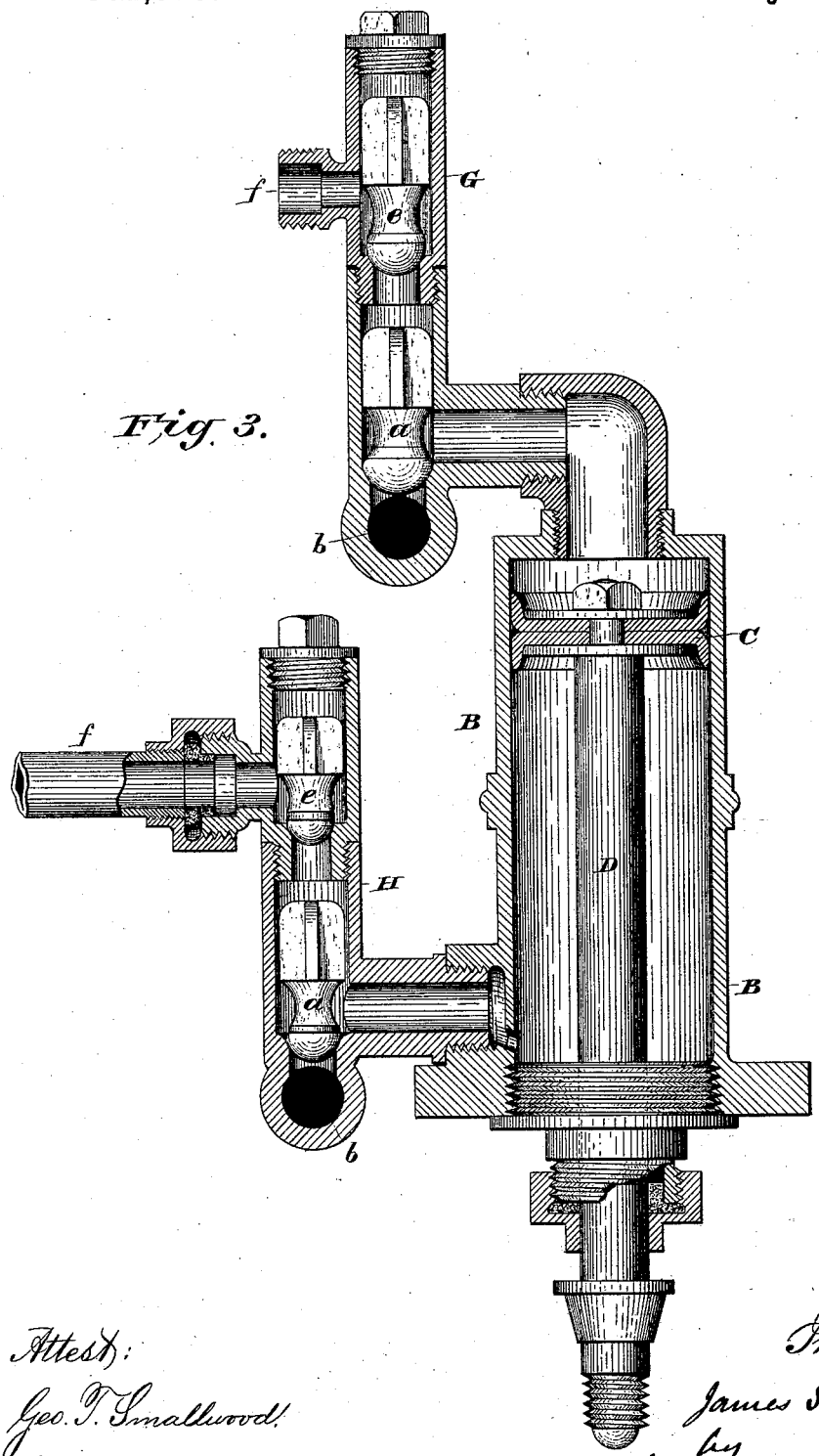
APPARATUS FOR THE MANUFACTURE OF AERATED AND MINERAL WATERS.

No. 301,919. Patented July 15, 1884.

Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

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APPARATUS FOR THE MANUFACTURE OF AERATED AND MINERAL WATERS.

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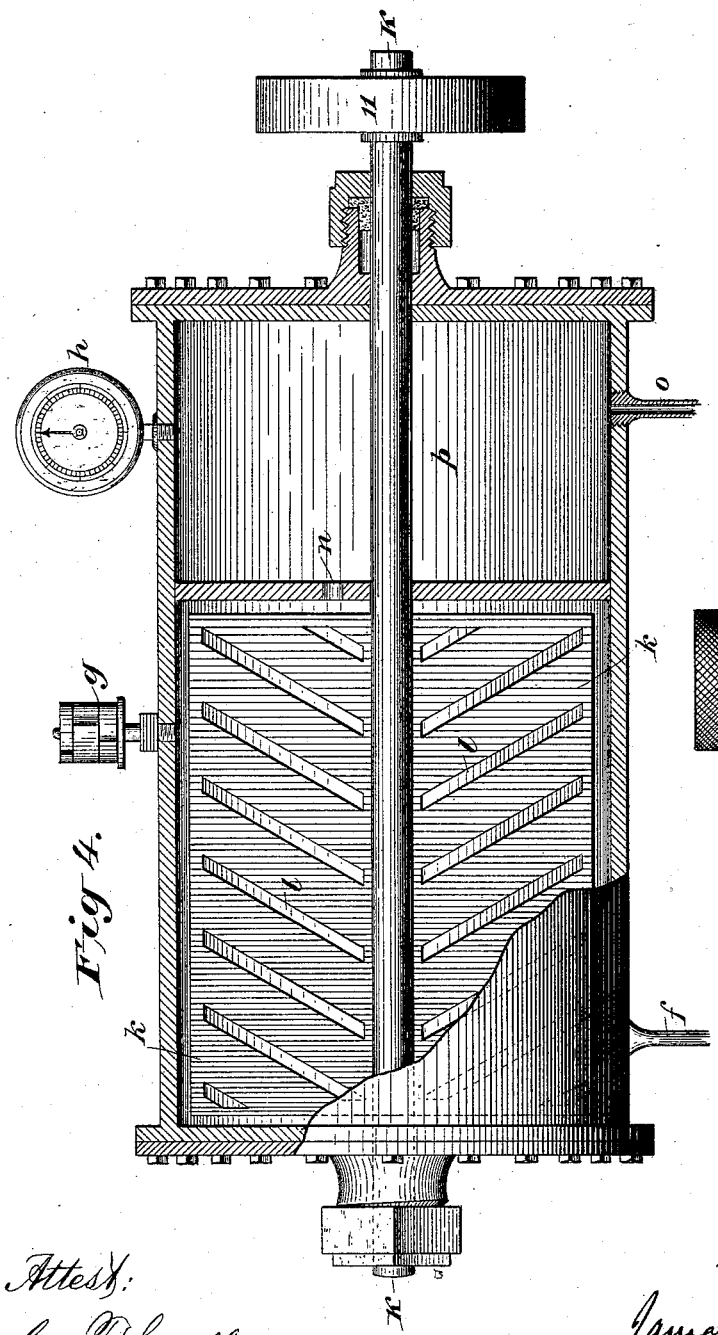

Fig 4.

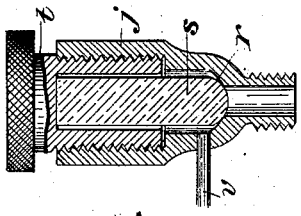

Fig 5.

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UNITED STATES PATENT OFFICE.

JAMES S. PEARSON, OF NEW YORK, N. Y.

APPARATUS FOR THE MANUFACTURE OF AERATED AND MINERAL WATERS.

SPECIFICATION forming part of Letters Patent No. 301,919, dated July 15, 1884.

Application filed June 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. PEARSON, a subject of the Queen of Great Britain, residing at New York city, in the State of New York, have invented certain new and useful Improvements in Apparatus for the Manufacture of Aerated and Mineral Waters, of which the following is a specification.

My invention relates to apparatus designed for the production of artificial mineral and aerated waters. It is my object to produce an efficient and simple apparatus of this kind, one in which there will be a thorough and uniform incorporation of the gas and liquid, which will work continuously, delivering without intermission the requisite quantity of aerated liquid to the bottlers, and which will have a greater and more varied capacity for work than has been the case heretofore in machines or apparatus of like type.

The nature of my improvements and the manner in which the same are or may be carried into effect can best be explained and understood by reference to the accompanying drawings, in which I have represented an apparatus embodying my invention in its preferred form.

Figure 1 is a front elevation of the apparatus. Fig. 2 is a side elevation of the same with the condensers and liquid-supply tanks removed. Fig. 3 is a vertical central section of the pump-cylinder and valve-boxes. Fig. 4 is a longitudinal central section of one of the condensers. Fig. 5 is a longitudinal central section of the equilibrium-valve hereinafter described.

The power for driving the pump of the aerating apparatus proper can be obtained from any convenient source. In the present instance it is obtained from a steam-engine mounted in or on the same frame, A, that carries the aerating apparatus. The engine is of ordinary vertical type, having steam-cylinder 1, piston and piston-rod 2, connecting-rod 3, crank-shaft 4, fly-wheel 5, eccentric and eccentric-rod 6, and slide-valve 7. On the crank-shaft is a pulley, 15, to drive any machine that may be desired, and also a toothed pinion, 8, which gears with a spur-wheel, 9, fixed upon the pump-shaft 10. Pinion 8 is mounted to slide on a key-bed on the engine-shaft 4, so that it may be thrown into and out of gear with the pump-shaft, and for this purpose a shifting-lever and connecting-devices should be combined with said pinion. The pinion 8 is smaller than the spur-wheel 9, so that the engine-shaft will make several revolutions to every one of the pump-shaft. In the arrangement shown in the drawings the rate of movement is as three to one, the object being to insure a powerful, uniform, positive movement of the pump. When the pump is not in action, and the pinion 8 is out of gear with the pump-shaft, the engine can be used to drive any other machinery in the establishment where the apparatus is set up.

The pump is composed of a cylinder, B, containing a piston, C, composed of two cupped leather washers held between two metallic heads or disks, as indicated in Fig. 3. The piston-rod D passes down through a stuffing box in the lower head of the cylinder, and is made fast to the bottom cross-head of a vertically-reciprocatory frame, E, supported in suitable guides, and having jointed to its top cross-head the connecting-rod F from the crank of pump-shaft 10. At each end of the pump-cylinder is a valve-box, G and H, the two being counterparts of one another. In each valve-box an inlet puppet-valve, *a*, controls the supply of gas and liquid drawn into the pump through the inlet-pipe *b*, which communicates on the one hand with gas-pipe *c*, leading from a gas-holder or other suitable source of gas-supply, and on the other hand with liquid-pipe *d*, leading from a source of liquid-supply, which in this instance is the tank I. There are two of these tanks I, one for the upper and one for the lower valve-box. The mingled gas and liquid drawn in through the inlet-valve *a*, the proportionate quantity of each being regulated and controlled by the taps or cocks *c' d'*, with which the gas and liquid supply pipes are respectively provided, are discharged through the outlet puppet-valve *e*, and pass through a pipe, *f*, into a condenser, J.

It will be noticed that each valve-box has its own system of supply and discharge pipes independent of and separate from that of the other valve-box, and that each can be regulated independently of the other. Thus from one end of the cylinder one condenser can be supplied with gas and liquid in given proportions and at a given pressure, while from the other end of the same pump-cylinder the other condenser can be supplied with gas and liquid of an entirely different character from

the other, in different proportion, and at a different pressure. In other words, the same pump will suffice under this arrangement to run at the same time two distinct sets of condensers for waters of entirely different characters.

Each condenser J is like the other, so that a description of one will answer for both. It has by preference the form of a cylinder closed at the ends by heads bolted thereto, through stuffing-boxes on which heads pass the agitator-shaft K, which is driven by belt and pulley 11 from any suitable source of power—as, for instance, from pulley 12 on the pump-shaft. The condenser is provided with any ordinary or suitable safety-valve, *g*, a pressure-gage, *h*, and a water-gage, *i*. It is also provided with a device, *j*, which I term a "regulating-valve," and which will be hereinafter referred to. The agitator-shaft is provided with a suitable arrangement of fans or breakers. That which I prefer and which I have found most effective is plates *k*, fixed on the shaft and formed with diagonal slots *l*, those in the one plate slanting in a direction opposite to those in the other. By this means I cut the liquid and produce a thorough intermingling of it with the gas. To still further insure the thorough intermixture of the gas and liquid, and at the same time also to maintain the aerated liquid in a still and quiet state at the point where it is drawn off from the condenser to the bottling-machines, I extend the agitator-blades or breakers part way only of the length of the condenser, and divide this portion of the condenser from the other by a partition, *m*, in which are formed at a suitable height, preferably somewhat above the axis, one or more holes or openings *n*. The gas and liquid entering the condenser through pipe *f* are worked together and mixed in the agitator-chamber proper, where the liquid must accumulate until it can overflow through the partitions into the delivery-chamber *p* beyond, whence it is drawn off to the bottling-machines through the draw-off pipe *o*.

The regulating-valve *j*, hereinbefore referred to, is located on the discharge-chamber *p*. Its construction can be considerably varied; but I prefer to make it as shown in Fig. 5. Its shell is screwed into the condenser, so as to have communication with the interior of chamber *p;* and it is located at a height thereon which is about that of the normal level of the charged liquid in said chamber. In the interior of the shell is formed a conical valve-seating, *r*, against which bears a plug, *s*, of rubber or other suitable elastic material, which is pressed up against the seat by the hollow externally-screw-threaded stem *t*. This stem surrounds the rubber plug and screws into the valve shell or case, and by means of it the bearing of the rubber valve-plug against the seat can be adjusted and regulated so as to permit the rubber to yield and permit the escape of the contents of chamber *p* at any desired degree of internal pressure. A waste or return pipe, *v*, carries off the liquid that may escape through the valve. The valve is set to open when the pressure exceeds a predetermined limit, and to thus relieve the chamber of abnormal pressure.

It frequently happens that one or more of the bottling-machines supplied from the condenser slacken speed or stop bottling entirely. In this case the condenser becomes oversupplied or overcharged, and the delivery-chamber frequently contains an excess of gas as compared with liquid, or the reverse. The regulating-valve being set to yield to predetermined pressure, (which of course is less than that at which the ordinary safety-valve, *g*, is set to yield,) relieves the condenser of its oversupply, and, being placed at the normal level of the liquid in the chamber *p*, will, in thus relieving the condenser, discharge gas or liquid, according as there may be a superabundance or excess of one or the other.

I remark that each water-supply tank I has a float-valve, *w*, which will automatically open to admit fresh supply of water as soon as the water in the tank falls below a certain level. This, however, is a known arrangement and requires no further explanation.

Having described my improvements and the best way known to me of carrying the same into effect, I state in conclusion that I do not wish to be understood as restricting myself to the special details of construction herein shown and described in illustration of my invention, for the same can be considerably varied without departure therefrom; but

What I claim as new and of my invention is—

1. In an apparatus for the manufacture of aerated waters, the combination of the pump-cylinder and its piston, valve-boxes—one for each end of the pump-cylinder—provided each with a system of supply and discharge pipes independent of and separate from the other, and condensers, whereby each system draws its own supply of gas and liquid in regulable quantity, and discharges the same in mixed condition into the appropriate condenser, substantially as and for the purposes hereinbefore set forth.

2. The combination, with the condenser and agitator, of a perforated partition separating the delivery end of the condenser from that portion of the same which contains the agitating or mixing appliances, substantially as hereinbefore set forth.

3. The combination, with the condenser, of the regulating-valve applied to the delivery end or chamber of said condenser, under the arrangement and for operation substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand.

JAMES S. PEARSON.

Witnesses:
J. WALTER BLANDFORD,
A. H. NORRIS.