No. 616,243. Patented Dec. 20, 1898.

R. S. MAYER.

APPARATUS FOR PURIFYING WATER.

(Application filed Jan. 6, 1898.)

(No Model.)

Fig. 1.

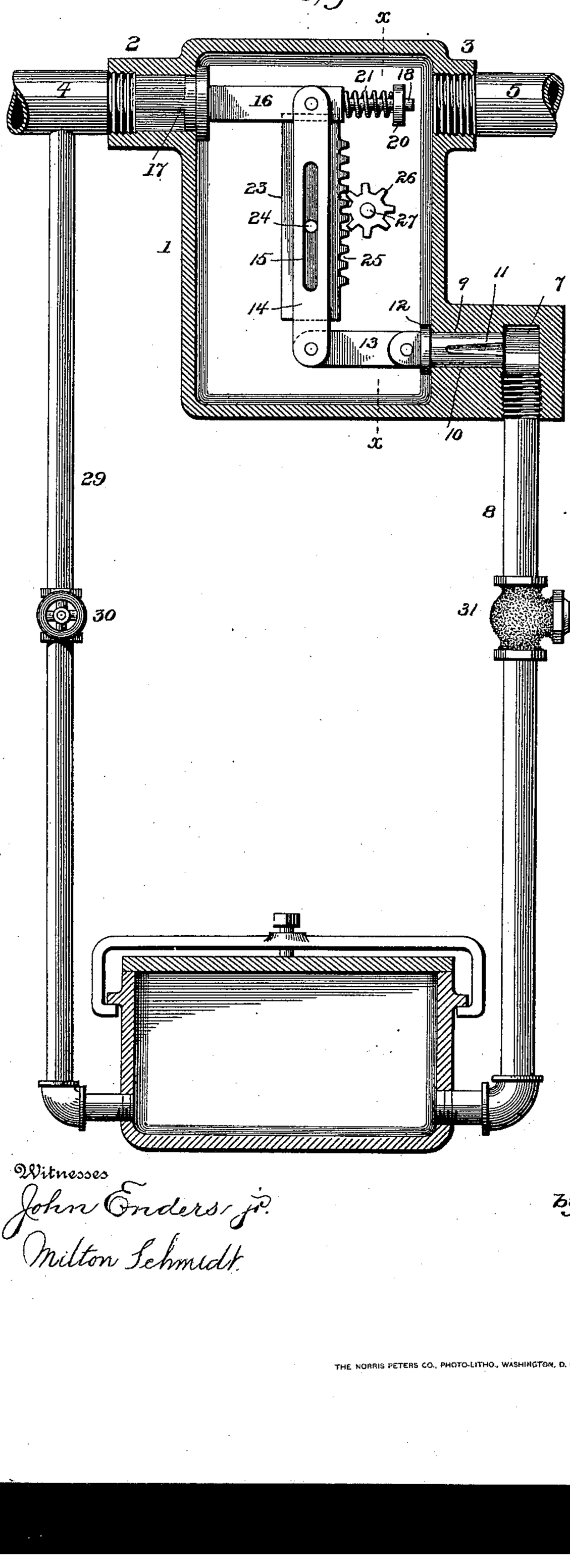
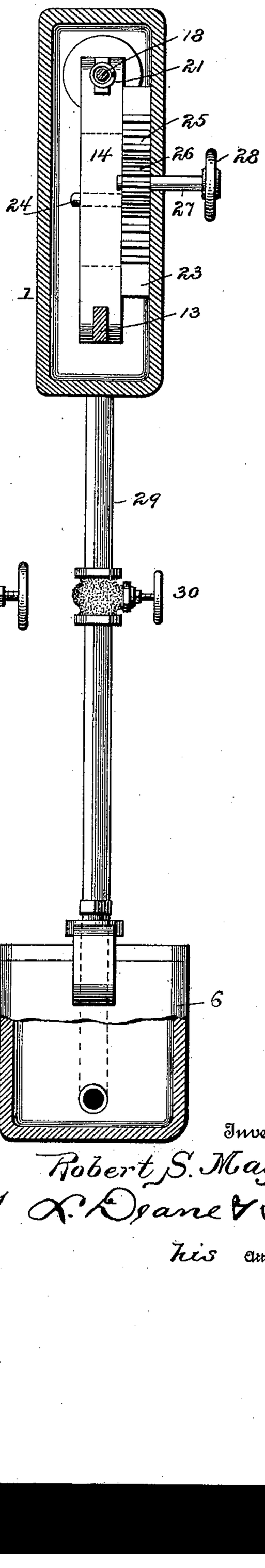


Fig. 2.



Witnesses
John Enders, jr.
Milton Schmidt.

Inventor
Robert S. Mayer.
by L. Deane & Son
his Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT SMITH MAYER, OF CINCINNATI, OHIO.

APPARATUS FOR PURIFYING WATER.

SPECIFICATION forming part of Letters Patent No. 616,243, dated December 20, 1898.

Application filed January 8, 1898. Serial No. 666,083. (No model.)

To all whom it may concern:

Be it known that I, ROBERT SMITH MAYER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Water-Purifying Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to water-purifying apparatus of that class or description in which the purification is effected by means of a chemical solution mixed with the water, and is intended as an improvement upon the invention for which Letters Patent No. 600,206 were granted to me under date of March 8, 1898.

The object of the present invention is to provide improved means for regulating the stroke of the chemical-valve so that it will be opened more or less, as the case may be, by the same movement of the inlet or pressure valve.

The invention consists, essentially, in providing the inlet or pressure valve rod with a lever pivoted thereto and formed with an elongated slot and also pivoted to a link connected with the chemical-valve, a movable fulcrum-pin passing through said slot and secured to a slide provided at one end with a series of rack-teeth, with which engages a pinion the shaft of which passes through the casing of the apparatus, as hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a water-purifying apparatus constructed in accordance with my invention. Fig. 2 is a vertical section on the line $x\,x$, Fig. 1.

In the said drawings the reference-numeral 1 designates a water-tank of any suitable size and material, which serves as a mixing-tank for the water and chemicals, provided at opposite sides with an inlet-opening 2 and an outlet-opening 3, with which are respectively connected inlet and outlet pipes 4 and 5. Located below said tank is a chemical tank or receptacle 6 for containing a soluble chemical—such as alum crystals, for instance—connected with a valve-chamber 7 by means of a pipe 8. This chamber communicates with the water-tank by a passage 9, in which is seated an inwardly-opening cylindrical valve 10, formed with a series of tapering peripheral grooves 11, forming passages for the chemical solution, and provided with a head 12, which when closed abuts against the tank and securely closes the passage 9. Pivotally connected with said valve is a link 13, which in turn is connected with the bifurcated lower end of a vertical lever 14, formed with an elongated slot 15, the upper end of which lever is bifurcated and pivotally connected with the rod 16 of a piston or pressure wing-valve 17, fitting in the inlet-opening 2 of the tank. The opposite end of this rod is reduced, forming a cylindrical stem 18, which passes through a guide 20, secured to the casing. A coiled spring 21 encircles this stem, with the ends abutting against said guide and valve rod, the tendency of which is to press the rod outward and close the piston or pressure valve.

The numeral 23 designates a vertically-movable slide provided with a fulcrum-pin 24, which passes through and works in the slot 15 of the lever 14. One edge of this slide is formed with a number of rack-teeth 25, with which engages a pinion 26, the shaft 27 of which passes through the tank and is provided with a hand-wheel 28.

Connected with the chemical-tank is a circulating-pipe 29, connected with the inlet-pipe 4 and provided with a stop-cock 30. The pipe leading from the chemical-receptacle to the water-tank is also provided with a stop-cock 31. The outlet-pipe 5 is connected with a settling-tank. (Not shown.)

The operation is as follows: The chemical tank or receptacle is supplied with a suitable chemical, such as alum crystals, and water being turned on will flow from the inlet-pipe to the mixing-tank. The resistance of the piston or pressure valve will cause a portion of the water to be supplied to the chemical-tank through the circulating-pipe, which water will become impregnated or saturated with the chemical and will be fed to the water-tank through the chemical-valve and will mix therewith and be conducted to the filtering or settling vessel by the outlet-pipe. By means of the connections between the piston or pressure valve and the chemical-valve the latter

will be opened more or less, according to the volume of water passing through the apparatus, so that a larger supply of the solution will be fed when a larger volume of water passes through the apparatus than when a smaller volume is passing therethrough, as the farther the piston or pressure valve is moved away from the inlet-opening the greater will be the movement of the chemical-valve, so that a larger portion of the water-passages in the latter will be uncovered. The coiled spring bearing against the rod of said valve serves as a counterbalance to the water-pressure.

During the above operation as the piston or pressure valve moves away from the inlet-opening the lever connected with its rod will be actuated, turning on the fulcrum-pin 24 and opening the chemical-valve through the medium of the link connected therewith. It is obvious that if the said pin 24 be moved up or down the stroke of the chemical-valve will be increased or decreased, as the fulcrum-point is then changed by the same movement of the piston or pressure valve. This adjustment is effected by means of the rack-slide and pinion, so that the feed of the chemical solution may be regulated according to whether the water is very turbid or comparatively clear.

I do not limit myself to location of the chemical-receptacle nor to the direction or position of the various parts, as it is obvious that they may be changed without affecting the principle of the invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a water-purifying apparatus the combination with the water-tank, having inlet and outlet openings, the chemical-tank connected therewith, the chemical-valve, the link pivoted thereto, the lever formed with a slot pivoted to said link, the piston or pressure valve and its rod connected with said lever, of the slide having formed with rack-teeth the pinion engaging therewith, and the fulcrum-pin on said slide, engaging with the slot in the lever, substantially as described.

2. In a water-purifying apparatus the combination with the water-tank, having inlet and outlet openings, the chemical-tank connected therewith, the chemical-valve, the link pivoted thereto, the lever formed with a slot, pivoted to said link, the piston or pressure valve provided with a rod pivotally connected with said lever and having a reduced end, the guide and the coiled spring, of the slide provided with a fulcrum-pin engaging with said slot, the rack-teeth at one edge and the pinion engaging therewith, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBT. SMITH MAYER.

Witnesses:
FRED HARTLIEB,
W. G. PARKER.