

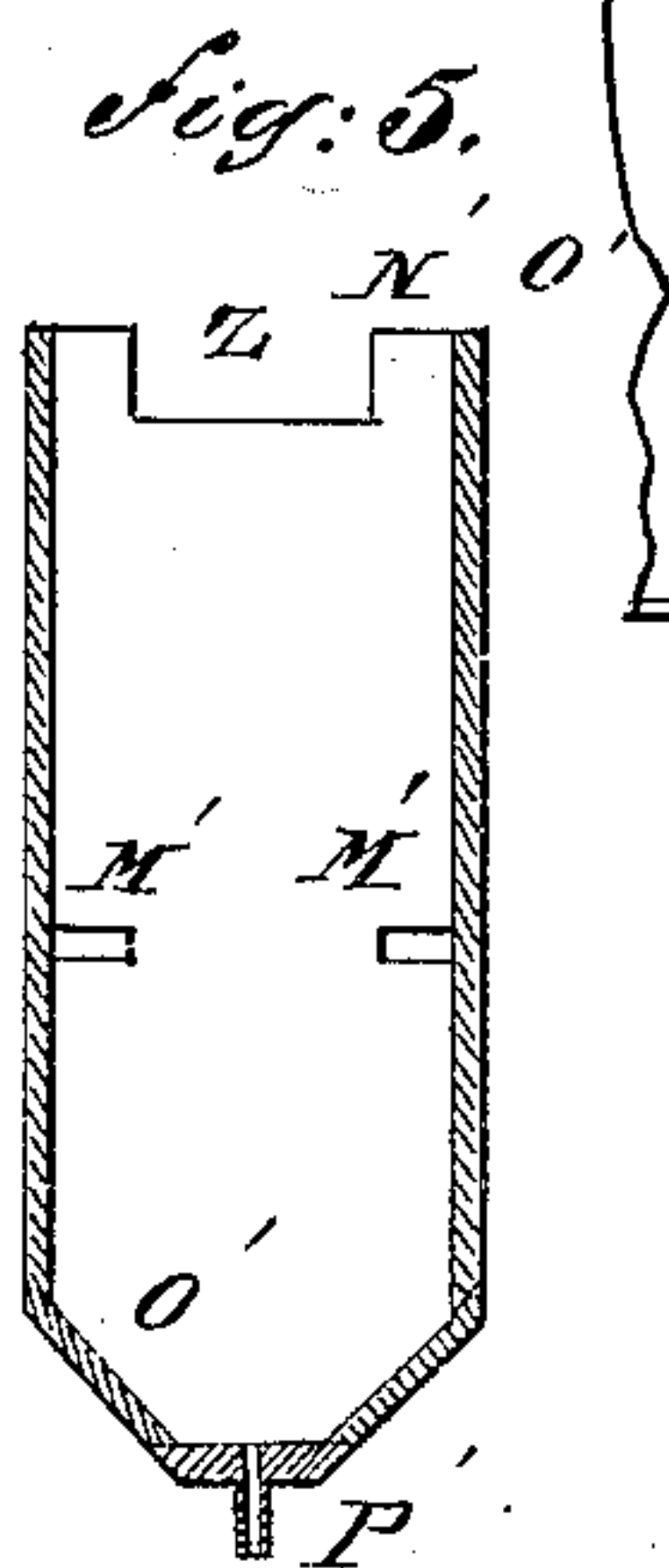
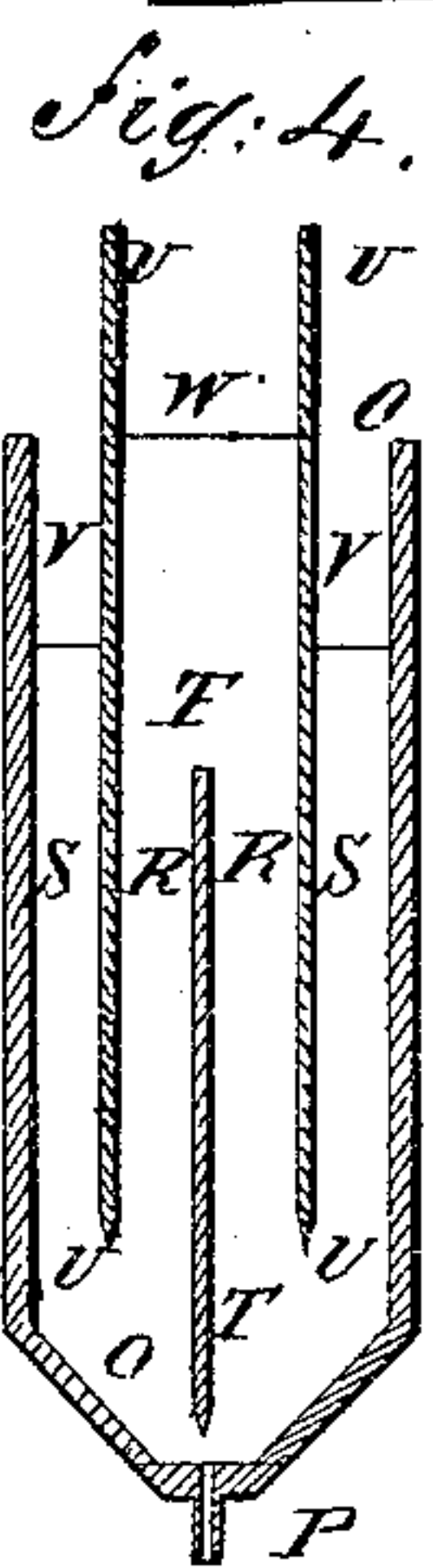
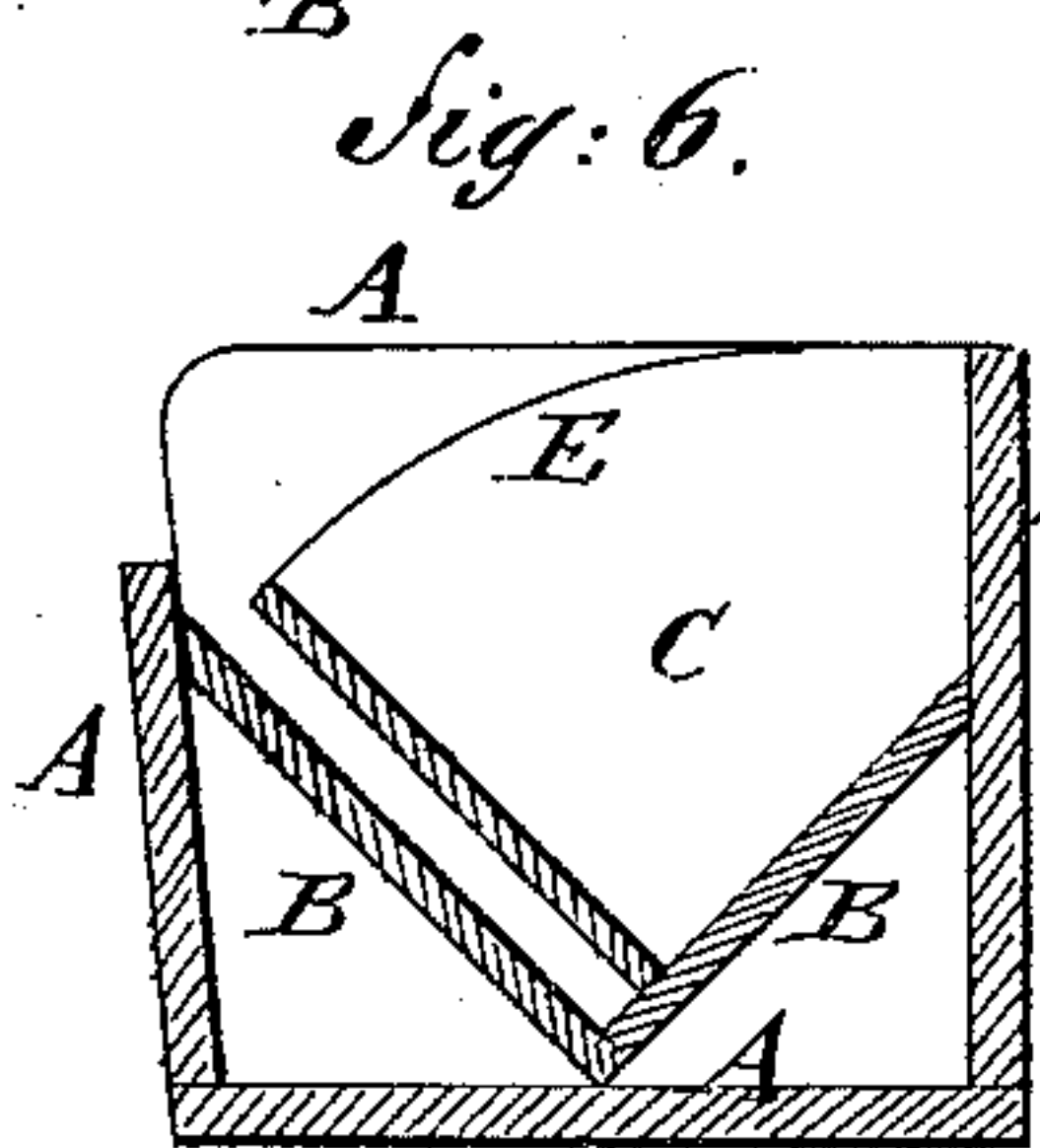
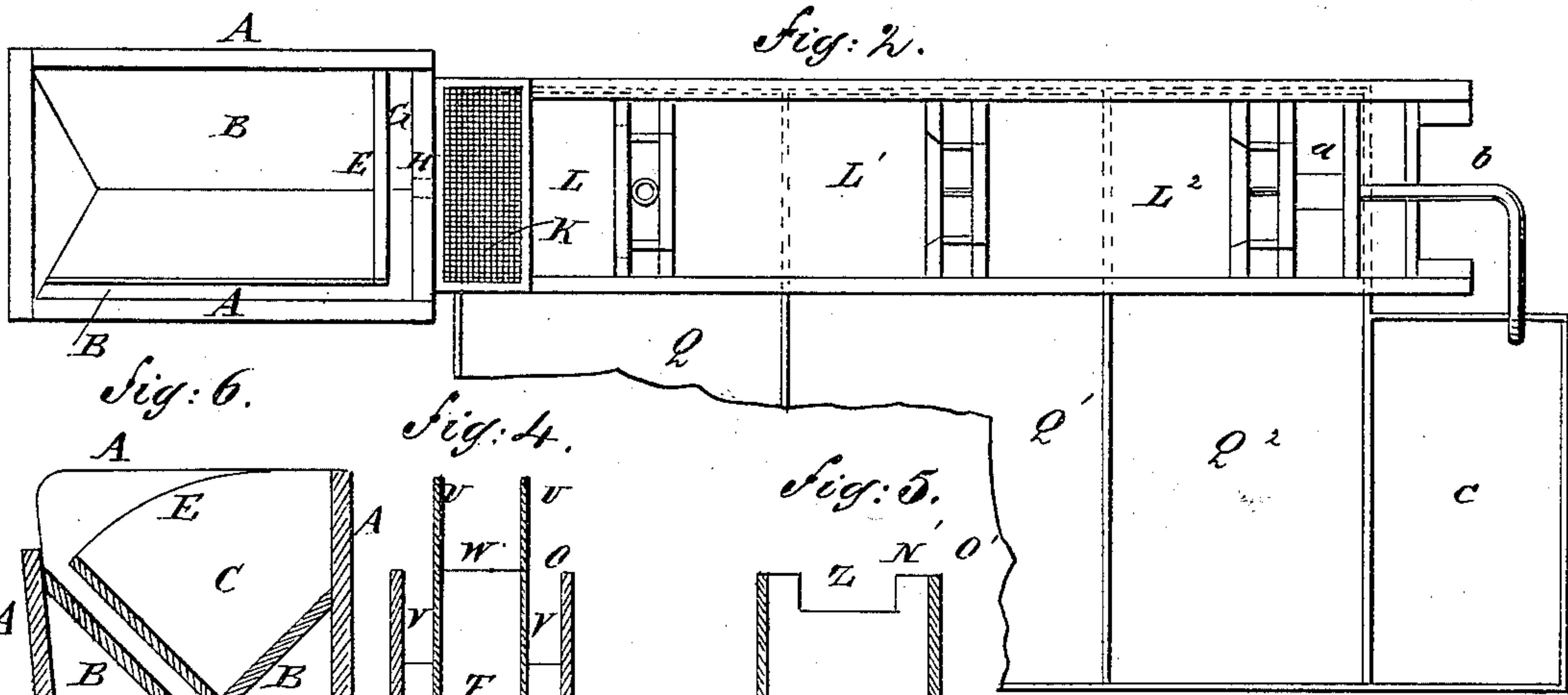
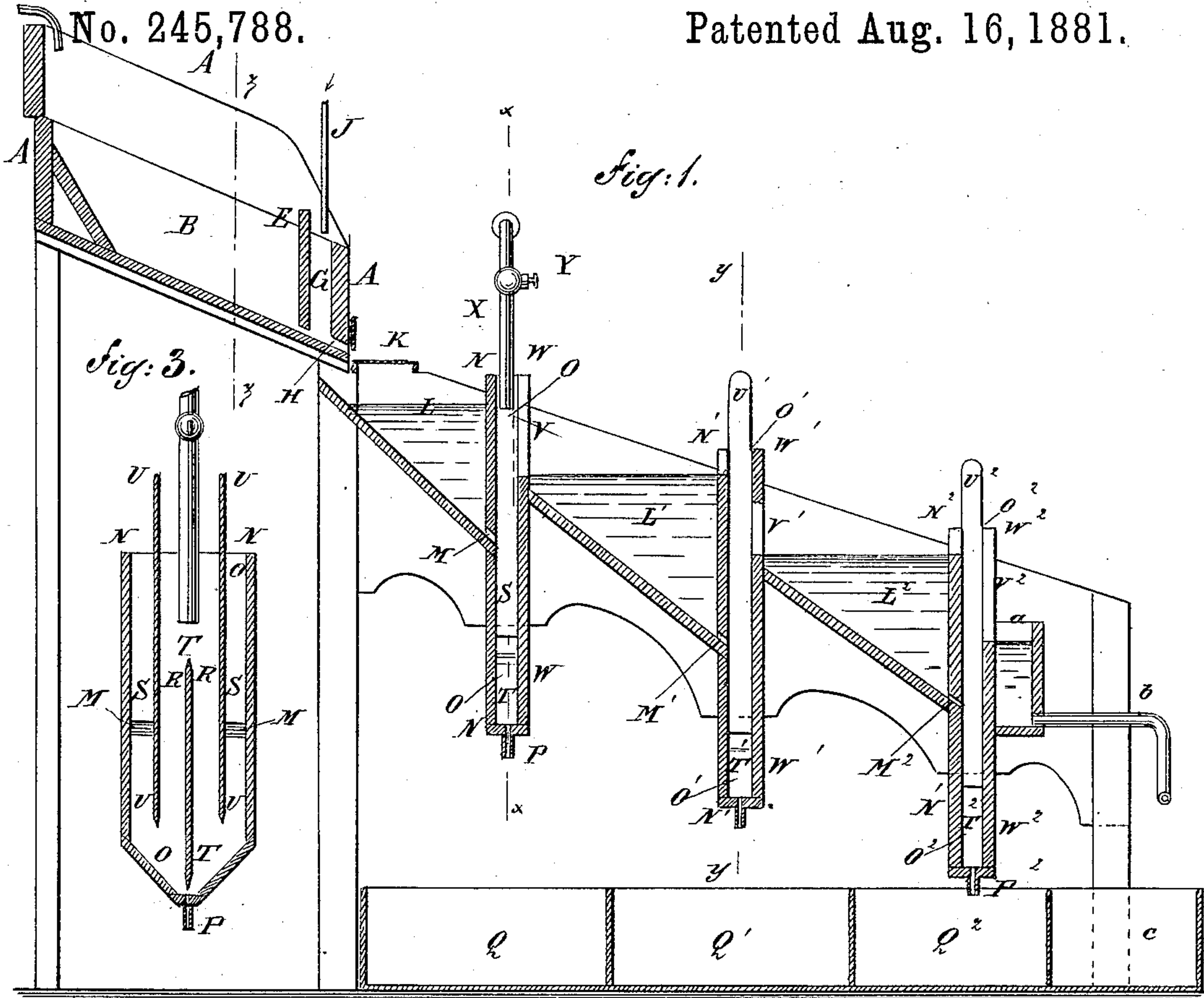
(No Model.)

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APPARATUS FOR CONCENTRATING ORES.

No. 245,788.

Patented Aug. 16, 1881.



WITNESSES:

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ARTHUR G. CHARLETON, OF MARMORA, ONTARIO, CANADA.

APPARATUS FOR CONCENTRATING ORES.

SPECIFICATION forming part of Letters Patent No. 245,788, dated August 16, 1881.

Application filed July 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR G. CHARLETON, of Marmora, in the Province of Ontario and Dominion of Canada, have invented a new and Improved Apparatus for Concentrating Ores, of which the following is a specification.

In the accompanying drawings, Figure 1 is a sectional side elevation of my improvement. Fig. 2 is a plan view of the same. Fig. 3 is a sectional end elevation of the same, taken through the line *x x*, Fig. 1, and looking to the left. Fig. 4 is the same section as Fig. 3, but looking to the right. Fig. 5 is a sectional end elevation of the same, taken through the line *y y*, Fig. 1, and looking to the left. Fig. 6 is a sectional end elevation of the hopper, taken through the line *z z*, Fig. 1.

The object of this invention is to facilitate the operation of concentrating ores.

The invention consists in an apparatus for concentrating ores constructed with a series of settling-compartments having inclined bottoms, and a series of divisional compartments having central partitions and side partitions, inlet-passages to admit ore, outlet-passages for the escape of the water and lighter ore, and discharge-passage for the escape of the heavier ore; and, also, in the construction of the hopper for feeding the ore to the first settling-compartment, as will be hereinafter fully described.

In the drawings, A represents the hopper, through which the ore is fed into the apparatus, and which is set in an inclined position. The hopper A is made with a V-shaped false bottom, B, having a partition, E, which is placed parallel with and at a little distance from the lower end of the hopper A, forming a narrow channel, G, through which the ore passes out through the lower end of the hopper, through an opening, H, a pipe, or other passage. The passage of the ore from the hopper is facilitated by a jet or jets of water introduced into the compartment O through a pipe or pipes, I. The escape of the ore from the channel G is facilitated by a small stream of water introduced into the said channel G through a pipe, J. As the ore escapes through the passage H it is received upon a screen, K, by which any large particles that may be

in the ore are detained, and through which the fine particles pass into the first settling-compartment, L, of the concentrating apparatus. The compartment L is made with an inclined bottom, down which the ore slides. The ore and water from the compartment L pass through openings, pipes, or other passages, M, in the rear wall, N, of the first concentrating or divisional compartment, O, at the lower corners of the said compartment L. The compartment O is made with a hopper or V-shaped bottom, and a pipe or passage, P, at the lowest part of the said bottom, through which the heavy particles of ore that settle into the lower part of the said compartment O are allowed to escape into a receiving-tank, Q, placed beneath the apparatus. The divisional compartment O is subdivided into two central sections, R, and two side sections, S, by three partitions, T U U. The side partitions, U, extend from the top or above the top of the compartment O nearly to the bottom of the said compartment O, and the central partition, T, extends from the bottom of the said compartment O nearly to a level with the top of the said compartment O.

The discharge-openings V are slots formed in the upper part of the forward wall, W, between the side partitions, U, and the side edges of the said compartment O, as shown in Fig. 4. Water is introduced into the central divisions of the compartment O through a pipe, X, provided with a stop-cock, Y, and leading to a tank or other reservoir of water placed at such a height above the apparatus as will give a suitable head or fall of water.

In front of the divisional compartment O is placed a second settling-compartment, L', having passages M' at the lower corners of its inclined bottom leading into a second divisional or concentrating compartment, O', which is made in the same manner as the first divisional compartment, O, except that its rear wall has a wide recess, Z, formed in its middle part, as shown in Fig. 5, to allow the bulk of the water from the settling-compartment L' to overflow into the middle section of the said divisional compartment O'. Any desired number of settling-compartments L and divisional compartments O can be used. The drawings represent

the apparatus as having three of each. From the last divisional compartment, O^2 , the water flows into a box or compartment, a , from which it flows through a pipe, b , into a receiving-tank, c , placed beneath the apparatus.

In using the apparatus, as the ore enters the first divisional compartment, O , as hereinbefore described, it meets currents of water rising through the outside sections or subdivisions of the said divisional compartment, and the lighter particles of ore are carried by and with the water into the next settling-compartment, L^2 , through the slots V' , while the particles of ore that are too heavy to be carried up by the ascending currents drop to the bottom of the said compartment and pass out through the pipe P . This operation is repeated in each successive part of the apparatus, and the ore that may be left in the water is allowed to settle in the last receiving-tank, c . The force of the current of water can be regulated by varying the size of the passages M by a slide, valve, or other suitable means, and by moving the side partitions, U , vertically or laterally.

With this apparatus ore can be separated by means of an ascending column of water and specific gravity into as many classes or grades as may be desired.

The apparatus can be applied to ore separated by screens or other appliances into grains or particles of equal size but having different specific gravities, or to particles of different sizes but having the same specific gravity.

The apparatus can be made applicable to material of any size, character, or weight (within workable limits) by varying the velocity of the currents of water, which can be done either by increasing or diminishing the head of the water, or by varying the size of the passages through which the water and the material pass, or by changing the shape and position of all or any of the said passages.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus for concentrating ores, constructed, substantially as herein shown and described, with a series of settling-compartments, $L L' L^2$, having inclined bottoms, and a series of divisional compartments, $O O' O^2$, having central partition, T , side partitions, U , inlet-passages $M M' M^2$, outlet-passages $V V' V^2$, and discharge-passages $P P' P^2$, as set forth.

2. In an apparatus for concentrating ores, the combination, with a series of settling-compartments, $L L' L^2$, having inclined bottoms, of a series of interposed divisional compartments, $O O' O^2$, having inlet-passages $M M' M^2$, outlet-passages $V V' V^2$, and discharge-passages $P P' P^2$, substantially as herein shown and described, whereby ores can be concentrated or graded by the action of ascending currents of water and specific gravity, as set forth.

3. In an apparatus for concentrating ores, the divisional compartments O , constructed substantially as herein shown and described, with a central partition, T , side partitions, U , inlet-passages M , outlet-passages V , and discharge-passages P , whereby the entering ore is made to meet ascending columns of water, as set forth.

4. In an apparatus for concentrating ores, the hopper A , constructed with a V -shaped false bottom, B , and a partition, E , parallel with the forward end of the hopper, substantially as herein shown and described, whereby the ore can be fed uniformly to the first settling-compartment, as set forth.

ARTHUR GEORGE CHARLETON.

Witnesses:

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