

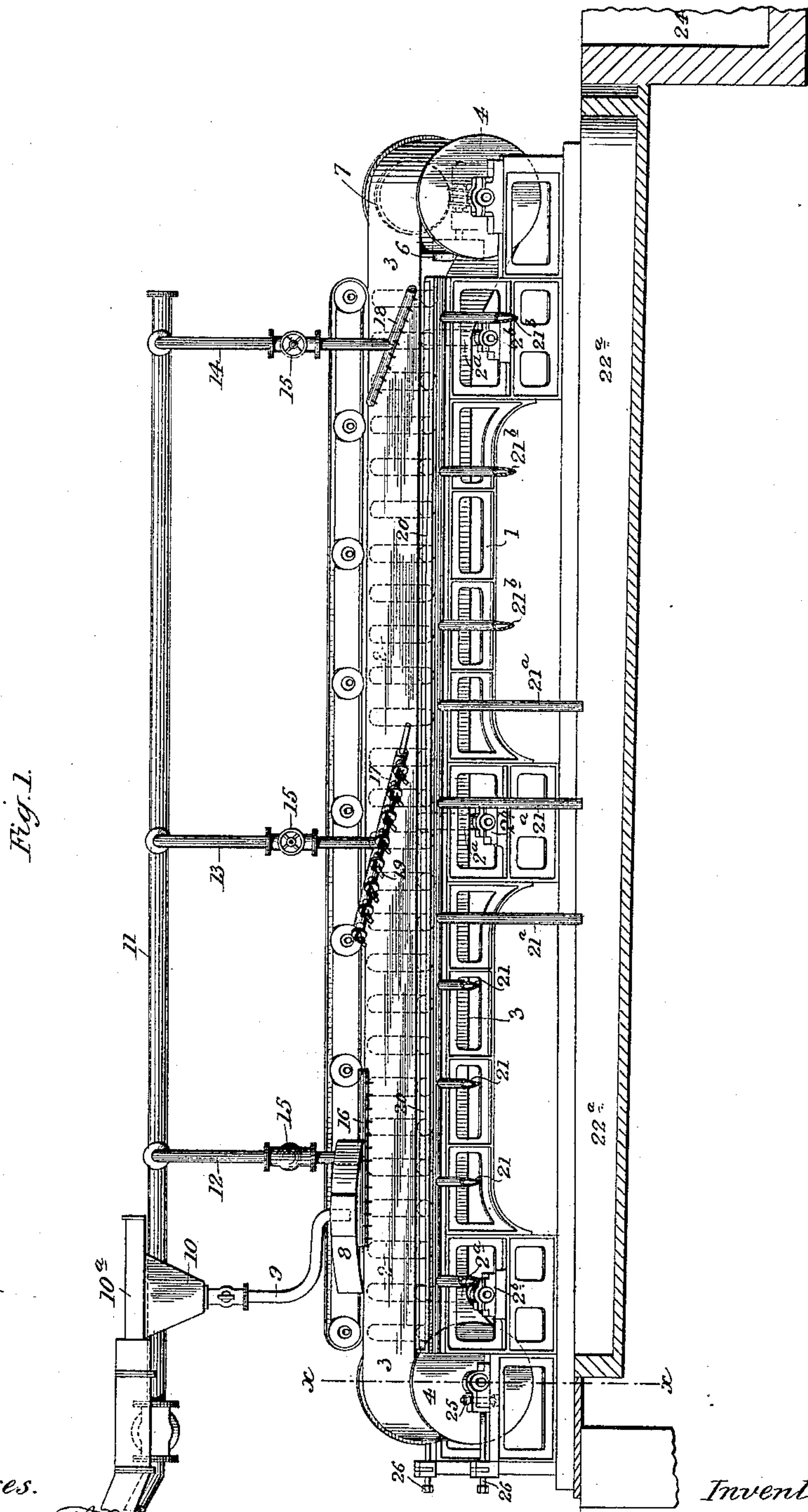
(No Model.)

3 Sheets—Sheet 1.

M. CASTELNAU.  
ORE CONCENTRATOR.

No. 446,963.

Patented Feb. 24, 1891.



*Witnesses.*

W. S. McArthur  
Georgia P. Kramer.

*Inventor*

Marcelini Castelnau

By Foster Freeman  
Attorneys,

(No Model.)

3 Sheets—Sheet 2.

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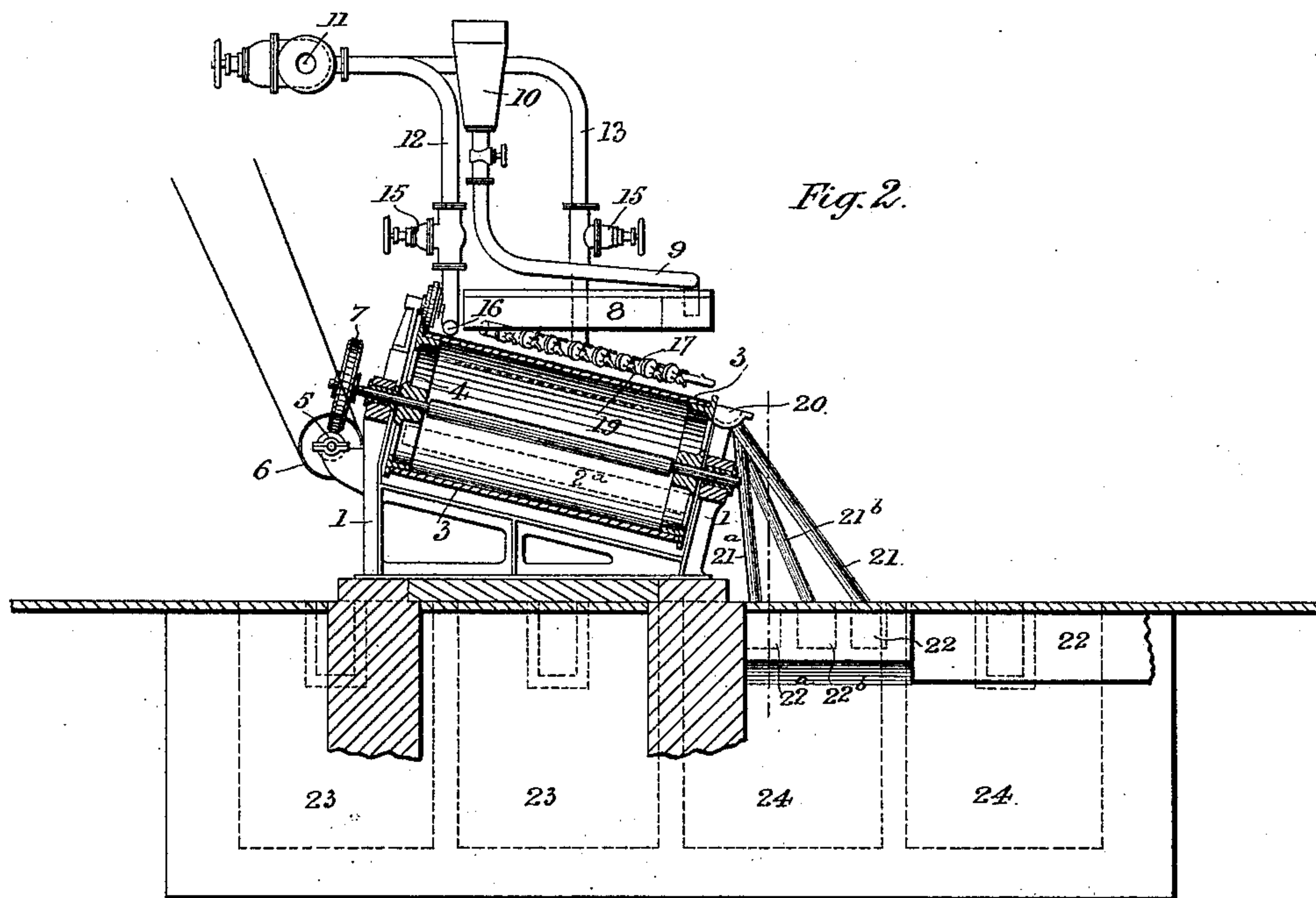


Fig. 4.

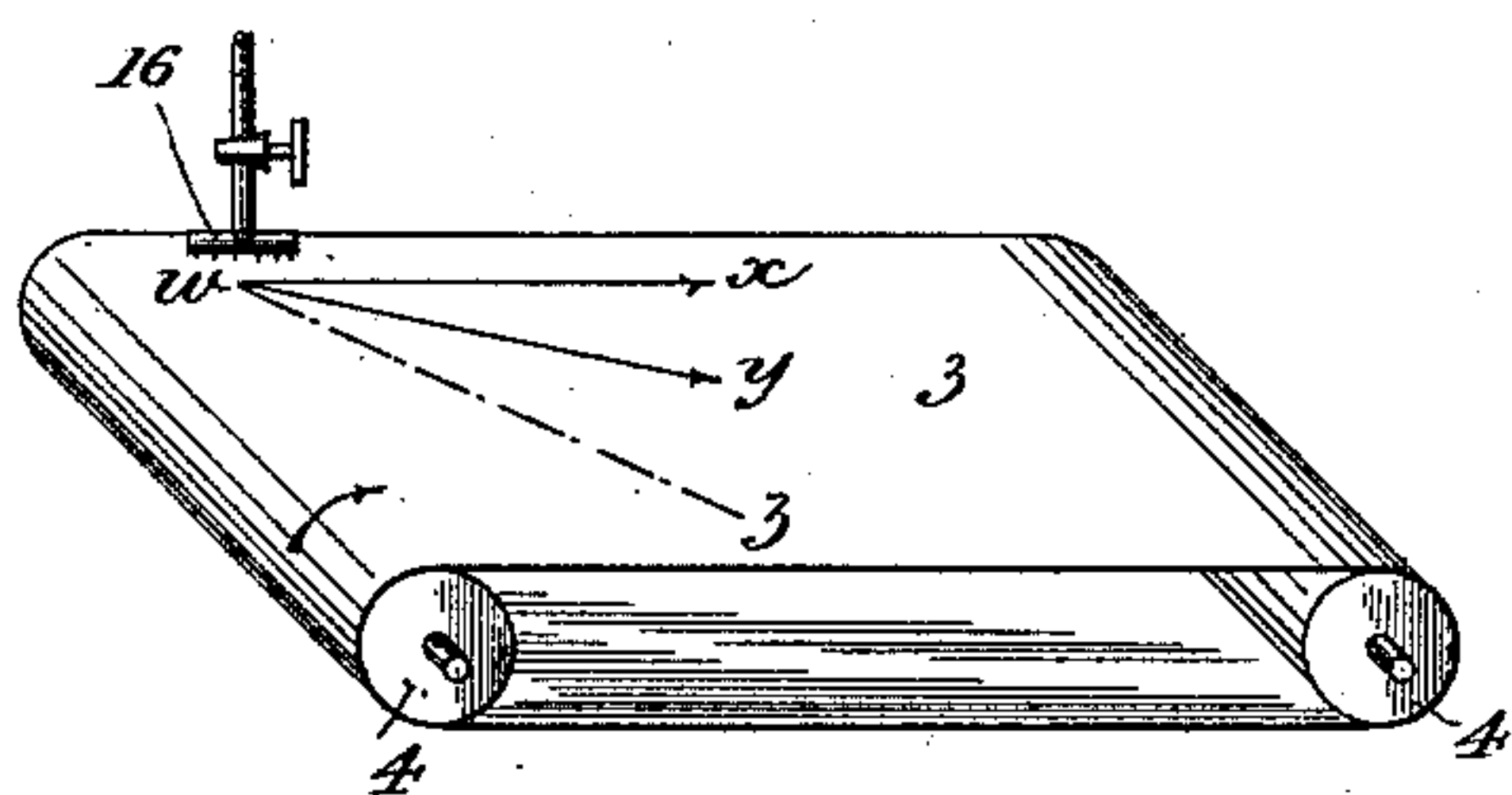
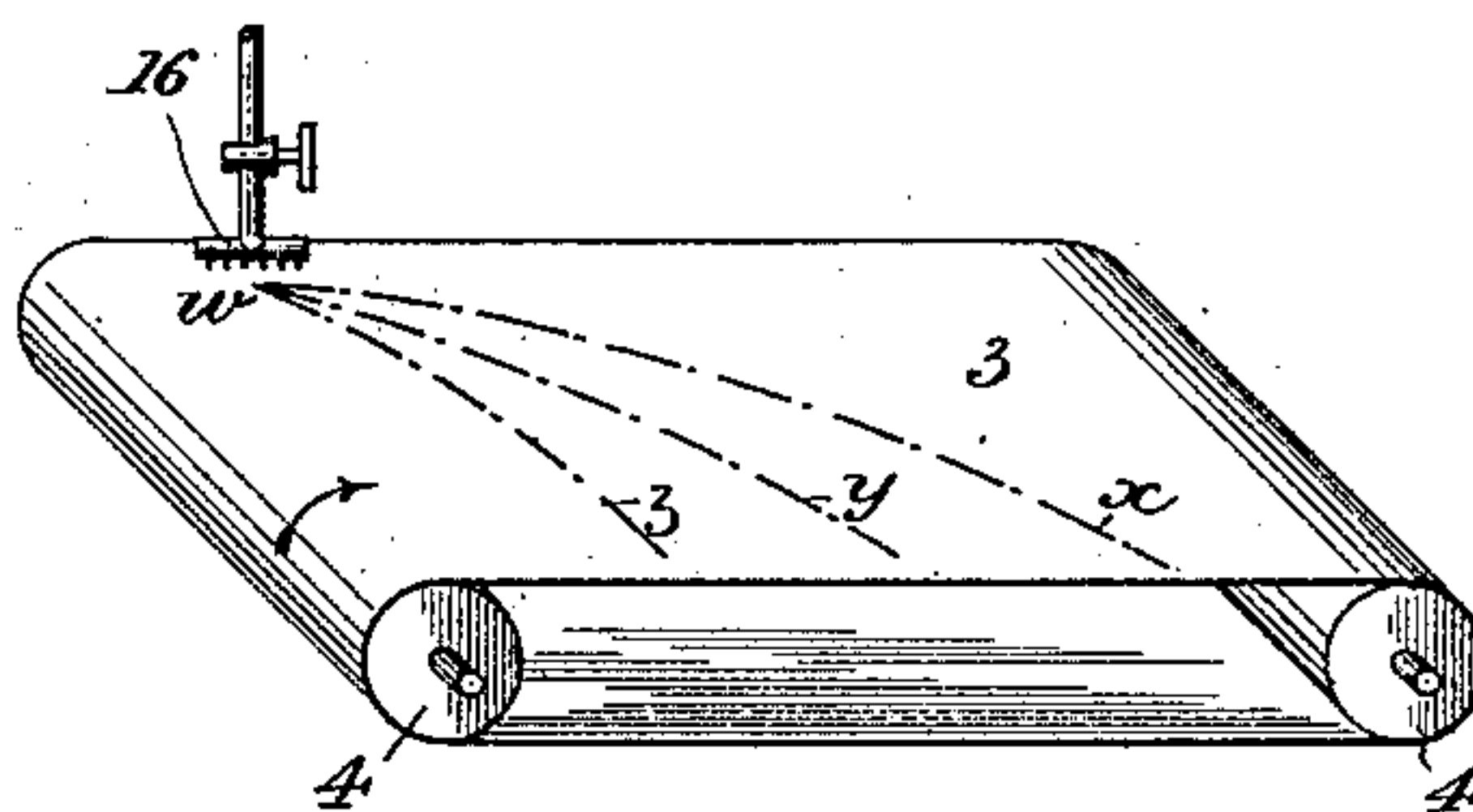


Fig. 5.



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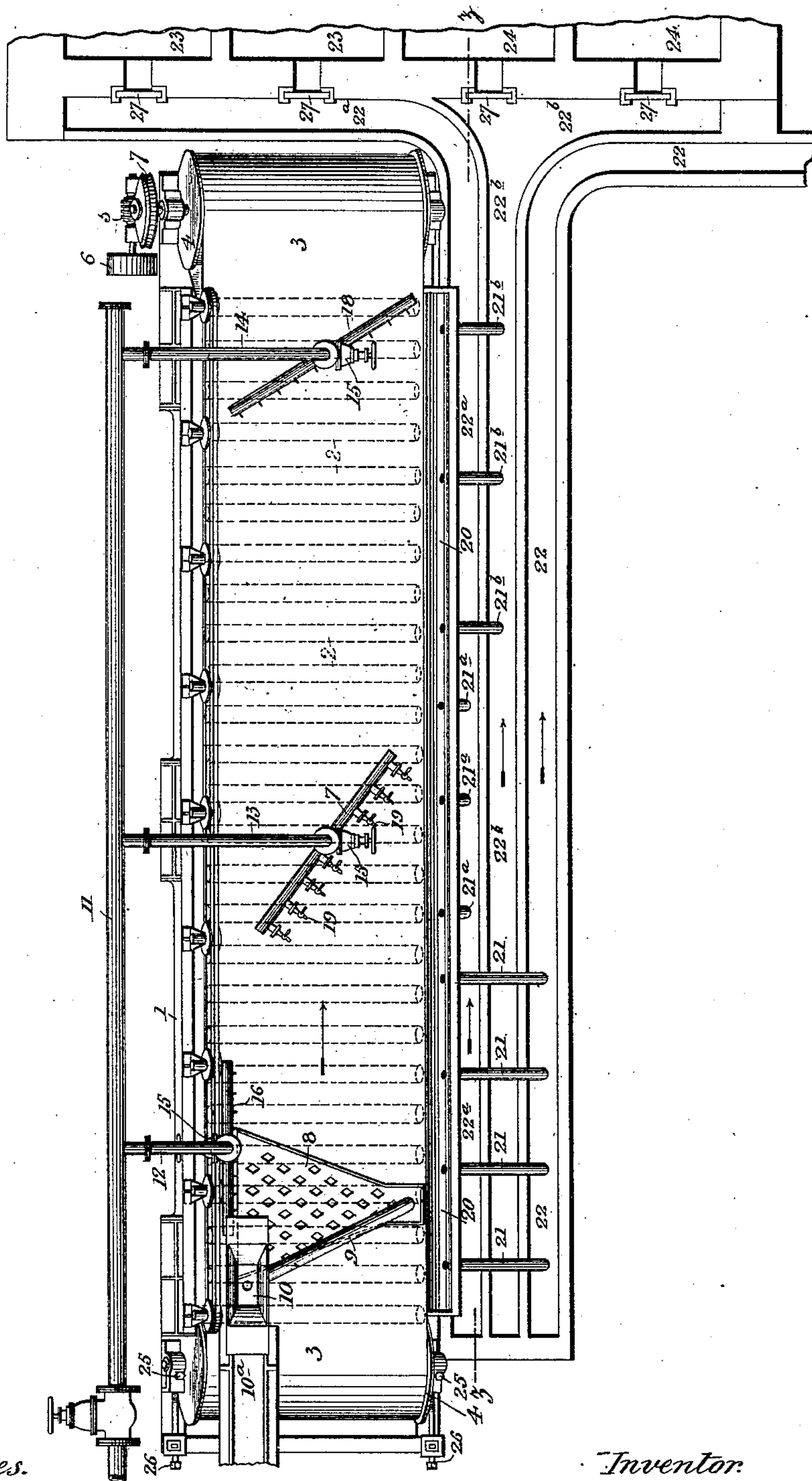
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Fig. 3.



Witnesses.

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# UNITED STATES PATENT OFFICE.

MARCELIN CASTELNAU, OF PARIS, FRANCE.

## ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 446,963, dated February 24, 1891.

Application filed April 10, 1890. Serial No. 347,373. (No model.) Patented in France August 6, 1889, No. 200,016, and in Belgium August 14, 1889, No. 87,377.

*To all whom it may concern:*

Be it known that I, MARCELIN CASTELNAU, a citizen of the French Republic, residing at Paris, in said Republic, have invented a certain new and useful Improvement in Ore-Concentrators, (for which I have obtained Letters Patent in France under date of August 6, 1889, No. 200,016, and in Belgium under date of August 14, 1889, No. 87,377,) of which the following is a specification.

My invention relates to certain new and useful improvements in a class of concentrators or machines used for treating ores or other materials the component parts of which are of different specific gravities, the object of such machines being to separate the minerals from the earthy waste.

To clearly explain the nature of my invention, reference is made to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved machine with a part of the collecting-troughs in section, taken on line  $z z$ , Fig. 3. Fig. 2 is a sectional end view of same on the line  $x x$  of Fig. 1. Fig. 3 is a plan view of the machine, showing the collecting-troughs; and Figs. 4 and 5 are diagrammatic views illustrating the action of the machine.

The machine consists of a suitable frame-work 1, which carries rollers 2, which serve to support an endless traveling belt 3, of rubber or of sheet-steel or other suitable material, which passes over drums 4 4 at each end of the machine. These drums are carried in bearings in the frame-work, the latter being so arranged that the drums are at an angle to the floor-line, as are also the supporting-rollers 2 2, the result being that the traveling belt is maintained at this angle in the direction of its width, though it is parallel to the floor in the direction of its length. The angle of the belt may be varied slightly to suit any particular class of mineral by adjusting the bearings of the forward drum 4 in any convenient way, as by means of the adjusting-screws 25 25, by which the bearings are carried, one being raised and the other lowered, as desired. Both drums may be adjusted in the same way, if desired. The bearings are also adjustable endwise by means of the screws 26 26, so that

the belt may be tightened or loosened. The belt may be driven by any suitable means, as by the worm 5, operated from a pulley 6, said worm driving a pinion 7 on the shaft of one of the drums 4, as shown in Fig. 2. A distributor 8 is placed over the belt at the forward end, and into this the ore or other material is fed through a pipe 9 from a hopper 10, which is supplied from a chute 10<sup>a</sup>. The belt as it travels under the machine is supported on rollers 2<sup>a</sup>, carried in bearings 2<sup>b</sup> on either side of the frame-work.

A water-main 11 is provided at some point above the machine, and from this are branch pipes 12, 13, and 14, each having regulating-valves 15 and terminating in T-shaped branches 16, 17, and 18, the former 16 arranged to supply fine jets of water, as shown, being placed at the side of and parallel with the belt, but just above it. The latter 17 and 18 are placed centrally of the belt and also above it. All of the branches are capable of being turned to different angles, so that the flow of water may be straight across the belt or at an angle to same. The pipe 17 directs the main body of water onto the belt and is provided with taps 19, by which the flow may be regulated. The pipe 18 has fine jets similar to the pipe 16. A gutter or channel 20 is carried by the frame-work along the lower edge of the belt to collect the material from the latter. At the forward end of the machine pipes 21 communicate with this gutter 20 and with a trough 22, placed on or in the floor in front of the machine. About midway of the belt are similar pipes 21<sup>a</sup>, communicating with a trough 22<sup>a</sup>, and at the rear end of the belt are pipes 21<sup>b</sup>, communicating with a trough 22<sup>b</sup>. The trough 22 receives the waste earthy material, as hereinafter explained, and passes to any convenient point. The trough 22<sup>a</sup> receives the next material from the belt, consisting of the poorer quality of ore and metal, which is deposited in the tanks 23, and the trough 22<sup>b</sup> receives the rich float metal, which is deposited in the tanks 24. Two of these tanks are shown for each trough; but one only is used at a time, the other being closed by a sluice-valve or similar arrangement 27, so that it may be opened when the other is full and



ready to be cleared out, so as to preserve the continuous action of the machine.

The operation of the machine is best illustrated by means of the diagrams, Figs. 4 and 5. The mineral falls from the distributor 8 onto the belt 3, which is traveling in the direction of the arrow, and falls, say, upon the spot marked  $w$  in Fig. 4, where it is met by the current of water from the pipe 16. It is therefore subjected to the following movements: first, in the direction  $x$ , due to the speed of the belt, and, second, in the direction  $y$ , due to the current of water coming from the pipe 16. These two movements result in a movement toward the lower edge of the sloping belt in the direction of  $z$ . If, therefore, there is received on the belt material composed of grains of equal size, but of different specific gravity, they will arrange themselves on the belt in three different parabolic arcs  $x y z$ , as shown in Fig. 5. These arcs are more or less open, according to the density of the material forming the arc  $x$ , said material consisting of the rich float metal which is received into the trough 22<sup>b</sup>. The branch water-pipe 14, Figs. 1 and 3, enables a current of water to be turned upon the belt at this point, so as to wash off this material

and prevent it passing over the end of the belt. The material on the arc  $y$  is of poorer quality and is received into the trough 22<sup>a</sup>, while the material on the arc  $z$  is waste earthy refuse, which is received into the trough 22. As will be seen, the machine is adapted to treat mixed ores containing different metals of different specific gravities.

I do not confine myself to the exact arrangement of machine or apparatus shown, as the details may be modified in many ways; but

What I claim is—

In an ore-concentrator, the combination, with the frame and laterally-inclined endless belt, of means for driving the belt, means for supplying ore thereto, and the water-main arranged above the belt and provided with adjustable T-shaped branches and valves for regulating the supply of water to each branch, substantially as described.

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

MARCELIN CASTELNAU.

Witnesses:

E. LHOMME,

R. J. PRESTON.