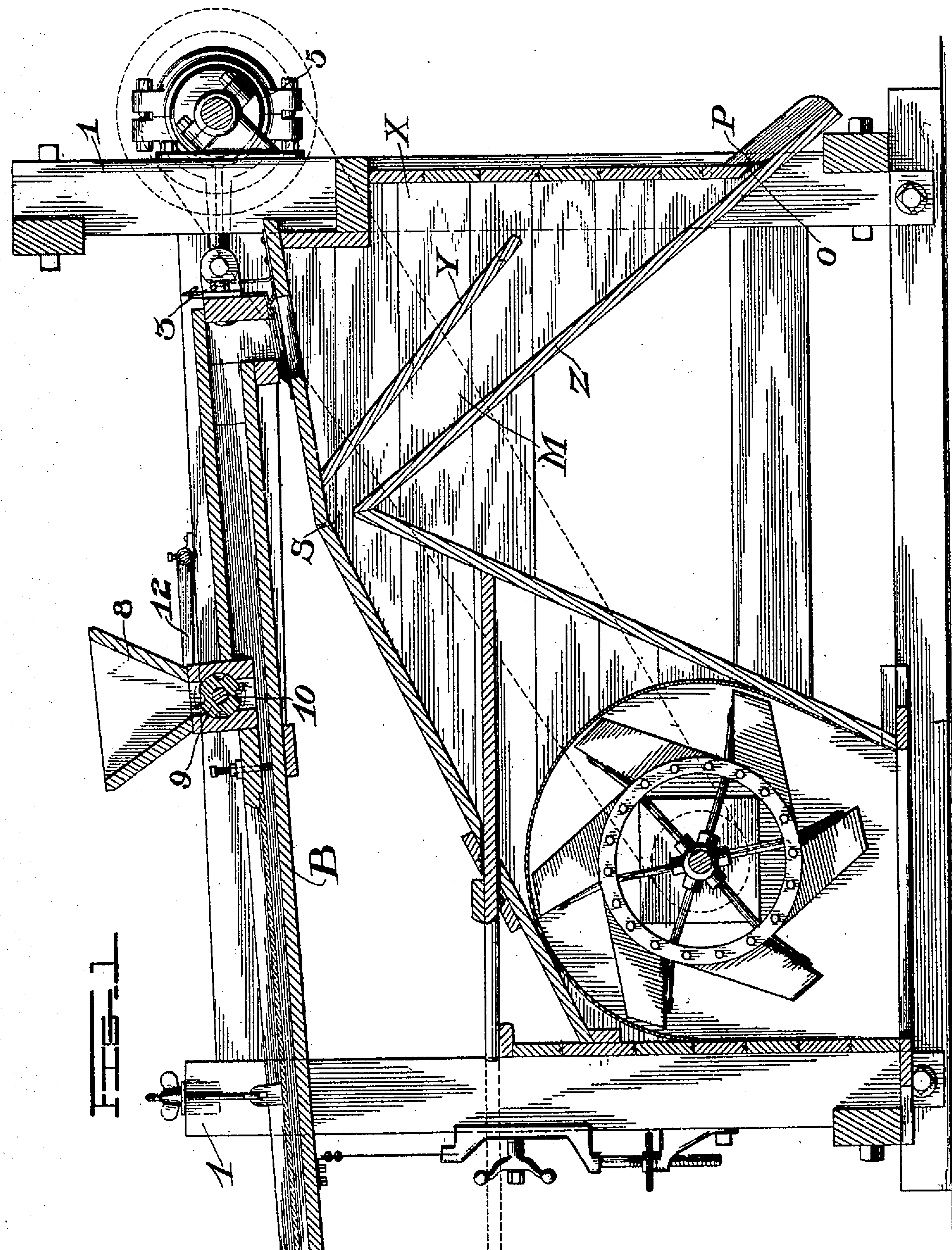
S. K. BEHREND.

ORE CONCENTRATOR.

APPLICATION FILED JULY 3, 1907.

916,257. Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.



Witnesses

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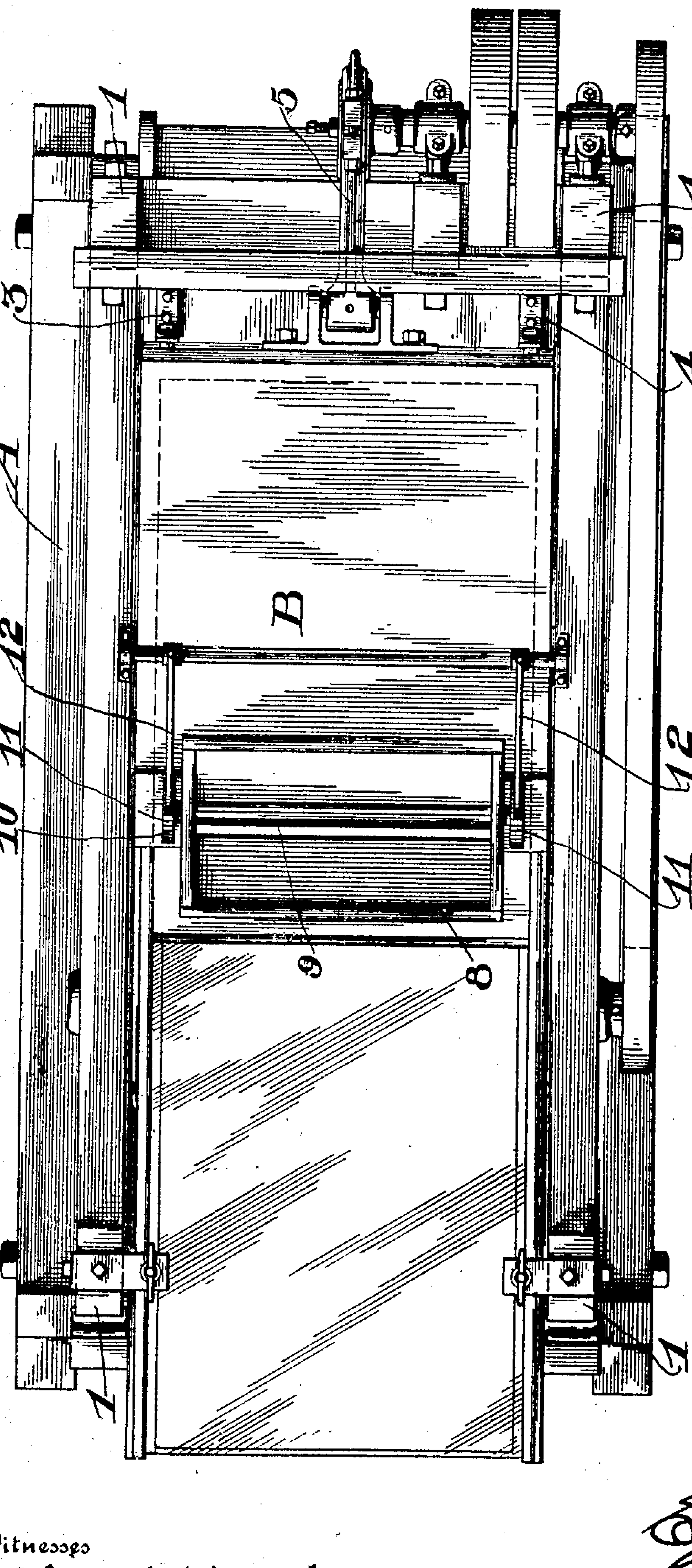

Fig. 2

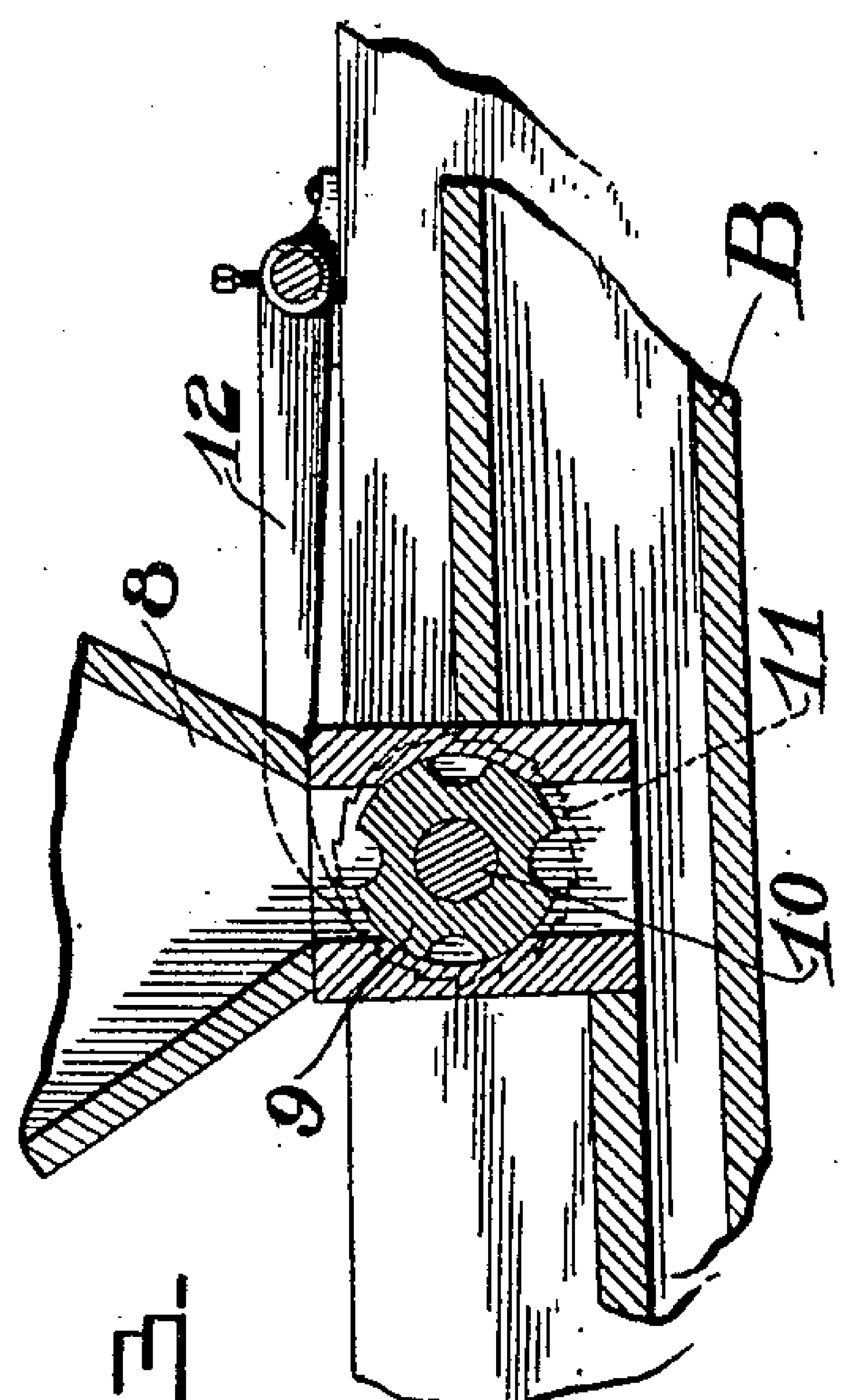

Fig. 3

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UNITED STATES PATENT OFFICE.

SAMUEL K. BEHREND, OF DENVER, COLORADO.

ORE-CONCENTRATOR.

No. 916,257. Specification of Letters Patent. Patented March 23, 1909.

Application filed July 3, 1907. Serial No. 382,037.

To all whom it may concern:

Be it known that I, SAMUEL K. BEHREND, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Ore-Concentrators, of which the following is a specification.

My invention relates to an improvement in ore concentrators, and more particularly to that variety of concentrators known as dry separators, the purpose of this invention being to provide as near perfect separation as possible by the so-called dry process, which separation is accomplished by the discharge of the material in measured quantities at or near the center of the table, immediately below which point of discharge the main separation takes place by the material coming in contact with a rapidly flowing exhaust air-current, while the table itself is undergoing a rapid agitation, so that the particles of greatest specific gravity, namely the values are continued onward to the lower end of the table, which preferably inclines a greater or less degree, while the lighter or waste products,—gangue, etc., known as "tailings"—work their way upward with the air-current, and are drawn through the suction chambers beneath the table and disposed of.

With the foregoing objects in view, this invention comprises novel features and details of construction, and arrangement of parts, which I will proceed to describe more fully hereinafter, and point out in the claim.

In the accompanying drawings:—Figure 1 is a vertical longitudinal section of my improved ore concentrator. Fig. 2 is a plan view. Fig. 3 is a detail.

A, represents the base, and 1, 1, are uprights erected thereon.

B, indicates the concentrator table. This is preferably supported by reasonably stiff springs 3 and 4 at the upper end where it is attached to the reciprocator 5, and it is supported at its lower end by means of a vibrator which rests in adjustable holders for raising and lowering and regulating the inclination of the table. A hopper 8 is located at or near the center of the table and in the bottom of this hopper a grooved roller or butterfly valve 9, is mounted on the shaft 10 whereby measured quantities of the ore are dropped upon the surface of the table as each groove empties its contents thereupon. The outer ends of the shaft 10 are provided with ratchet-toothed wheels 11, 11, the gravity pawls 12, 12, pivoted to the main upper timbers of the frame-work of the machine, imparting a step by step motion to the grooved roller or butterfly valve as the table is reciprocated so that the feed upon the table is intermittent, and in predetermined quantities.

The surface of the table may or may not be covered with riffles arranged as described in my concurrently pending application for Letters Patent, filed December 18, 1901; Serial No. 348,469, in which the table is provided with longitudinal slots and received in the slots are riffles, which are provided with openings through their upper surface through which the tailings are sucked by a suction fan.

A contracted passage S is formed for the purpose of causing the tailings-laden air-current to attain greater velocity and thus impart to each individual particle of the tailings a greater momentum, thereby compelling the tailings to travel in an almost direct path to the outlet O.

O, is a narrow slit extending entirely across the machine and is normally covered by the strip of light canvas or other suitable material as shown at P, which permits the tailings to pass under it, but at the same time prevents air being drawn into the machine through O.

Y, is an incline to prevent any material from lodging, which might be dropped in compartment X, by the air-current. It will be noticed that the space between the lower edge of incline Y and the surface Z, is much greater than the distance across passage S, thus giving the air-current much less velocity as it enters the wedge-shaped passage M, in its journey to the fan, thereby causing the air-current to effectually drop the solid particles it has heretofore been carrying with it. Meanwhile, through the shaking motion, the values being of greater specific gravity work their way down on the surface of the table, to the lower end where they are discharged. In this way measured quantities of ore are separately treated as it were, and by the time another quantity is discharged from the valve in the bottom of the hopper, the way is cleared for more perfect separation than could otherwise perhaps take place, and in this way a perfect separation is constantly taking place, so that a very large percentage of values is saved in a single operation through the machine.

More or less slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of the exact construction herein set forth.

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

In an ore concentrator the combination with a table, and means for reciprocating said table, of a hopper located at or near the middle of the table, a recessed roller in the bottom of said hopper, a shaft on which the roller is mounted, a ratchet wheel on the shaft, pawls engaging the ratchet wheel whereby the roller is intermittently rotated, a frame-work beneath the table in which the tailings are discharged through an opening at the upper end of the table, said frame-work having a constricted passage and two inclines leading from said passage, the space between the inclines being greater at the outer ends and one of the said inclines being longer than the other, and a suction fan beyond the constricted passage for creating suction of air.

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

SAMUEL K. BEHREND.

Witnesses:

JOHN T. HOLBROOK.

GEO. H. SAUER.