No. 742,510. PATENTED OCT. 27, 1903.

C. H. SNOW.

CONCENTRATOR.

APPLICATION FILED OCT. 16, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

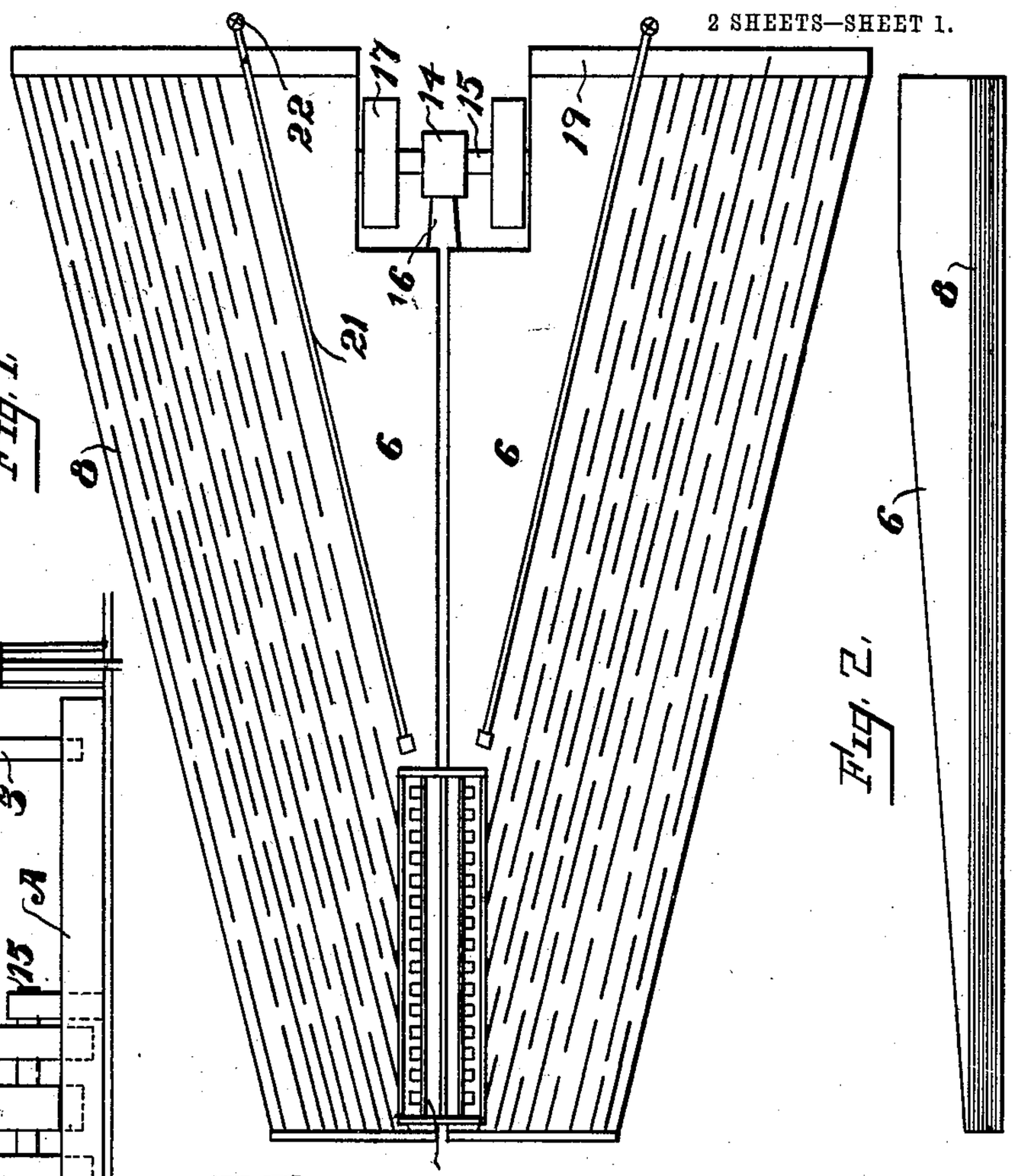

Fig. 1.

Fig. 2.

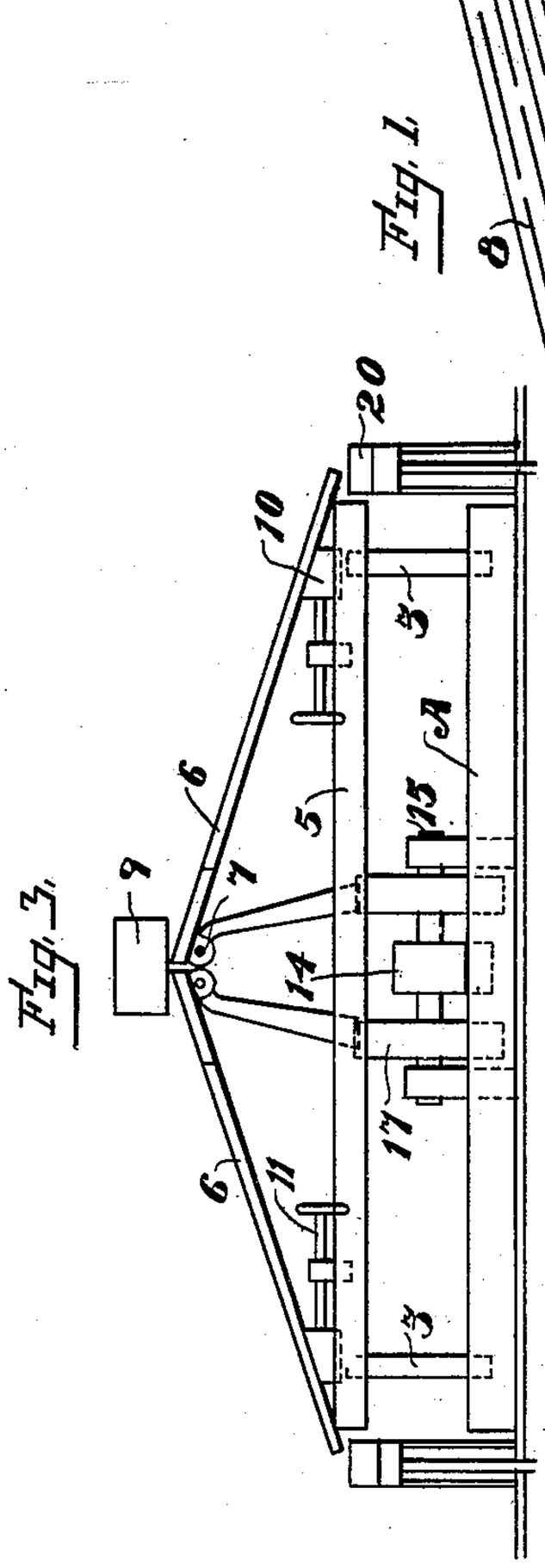

Fig. 3.

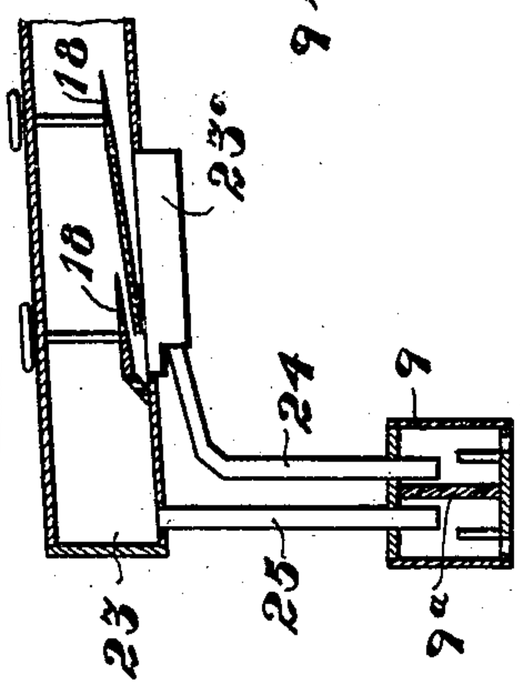

Fig. 4.

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Fig. 5.

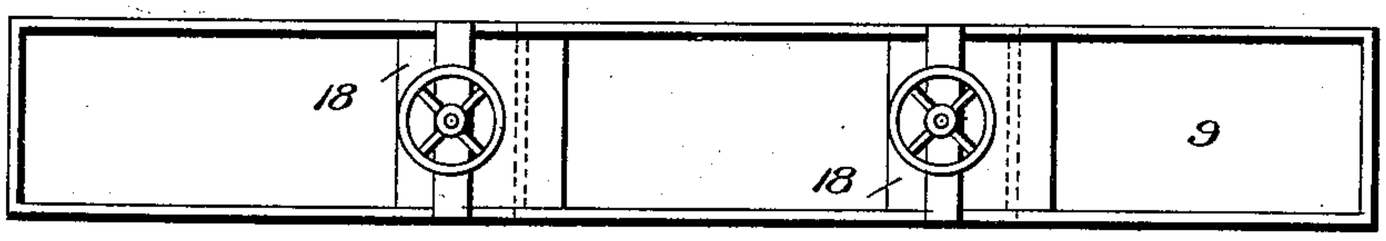


Fig. 6.

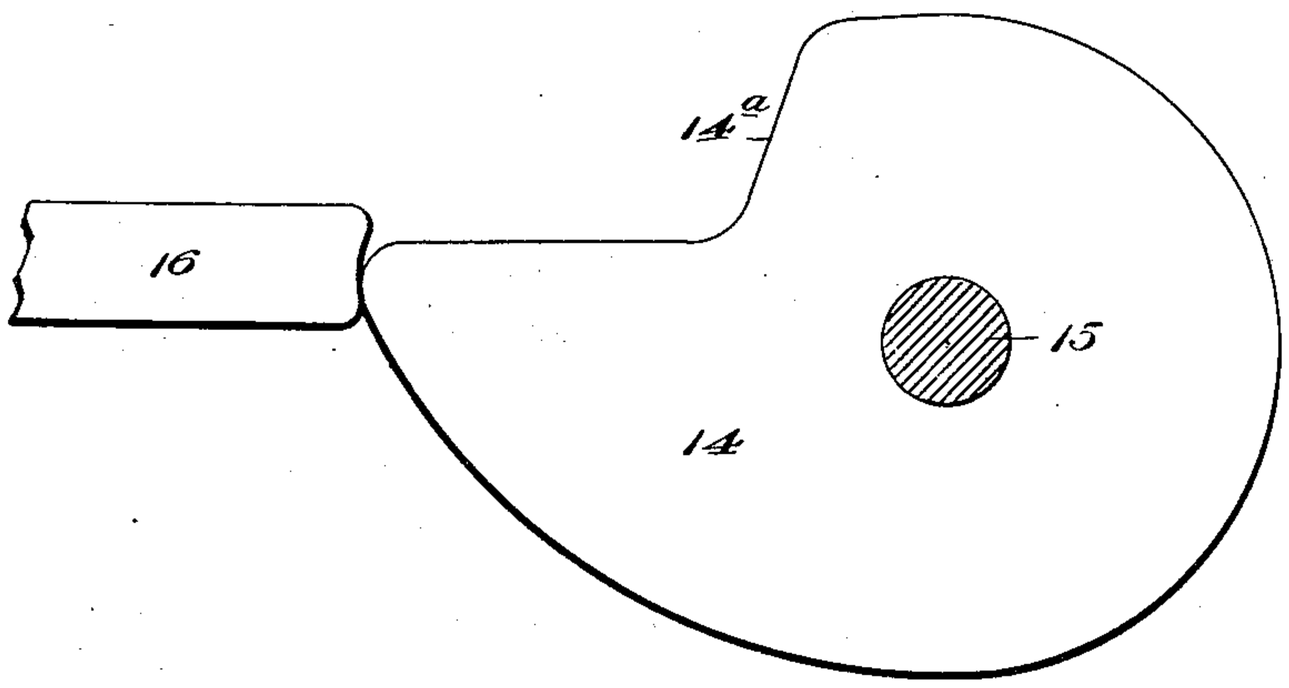
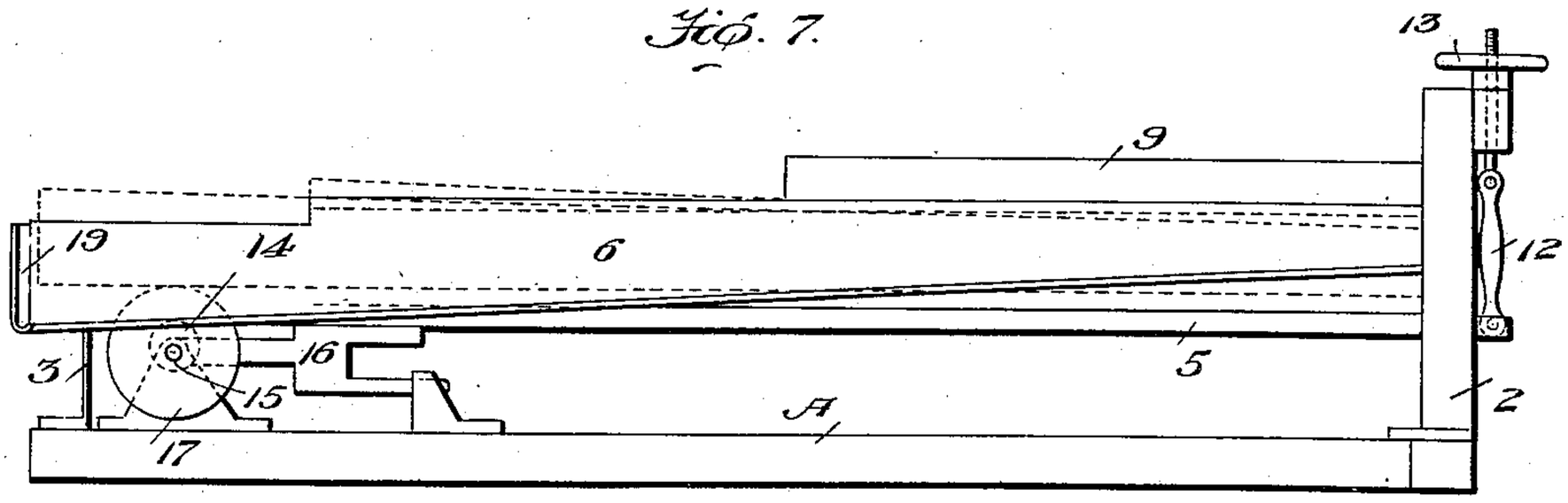


Fig. 7.



Witnesses

"Illegible"

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Attorneys

No. 742,510. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

CHARLES HORACE SNOW, OF STOCKTON, CALIFORNIA.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 742,510, dated October 27, 1903.

Application filed October 16, 1902. Serial No. 127,507. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HORACE SNOW, a citizen of the United States, residing at Stockton, county of San Joaquin, State of California, have invented an Improvement in Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in concentrating-tables.

It consists in the parts and the construction and combination of parts, as hereinafter more fully explained, having reference to the accompanying drawings, in which—

Figure 1 is a plan of my apparatus. Fig. 2 is a side view of a table, showing relative depths of its two ends. Fig. 3 is an end elevation of the apparatus. Fig. 4 is a longitudinal vertical section of separator and distributing-box. Fig. 5 is a plan of same. Fig. 6 is a side view of cam. Fig. 7 is a side elevation of apparatus, the dotted lines indicating longitudinal adjustment.

It is the object of my invention to make a concentrating-table that will admit of working pulps of different degrees of fineness simultaneously and independently of each other upon oppositely-inclined tables, which are independently adjustable and have a common concussive movement.

As shown in the accompanying drawings, A is a bottom frame of any suitable construction and material forming a bed upon which the machine is supported. 2 is a support fixed to said frame and from which the narrower or feed end of the table is suspended. 3 represents springs fixed to the opposite end of the frame A and serving to support the wider or discharge end of the table.

5 is a frame of any suitable material and is adapted to support the tables 6. These tables are here shown as two in number transversely inclined and having their inner and higher contiguous edges hinged to central supports 7 at the ends. The lateral edges of the tables are divergent from the feed end toward the discharge end and are substantially horizontal. Parallel with the outer edges of these tables are made sectional staggered longitudinal channels or riffles 8, and above the narrow end of the apparatus is a distributing-box 9, into which the pulp is first brought and by means of which it is properly distributed and delivered upon the tables, as will be hereinafter described. These tables being centrally hinged, as shown, have their outer edges supported upon transversely-slidable blocks or wedges 10, and these are adjustable by means of screws 11. This construction, it will be seen, allows the outer edge of either table to be raised or lowered independent of the other and any desired transverse inclination given to the tables, depending upon the character of the pulp which is being worked upon them. The narrow end of the table-carrying frame is suspended by a link, as at 12, from a support carried by the standard 2, and by means of a suitable screw or equivalent adjusting device 13 this end of the table may be raised or depressed, so that in addition to the transverse adjustment effected by the wedges 10 a longitudinal adjustment or tilt may be effected by the device just named. In this manner the surfaces of the tables may be independently adjusted to to any character of pulp which is being delivered upon them. The discharge end and widest portions of the table are cut away to admit the operating mechanism. The latter consists of a cam 14, mounted upon a shaft, as 15, and a concussion-block, as 16, fixed to the bottom of the frame 5 of the table, so that as the cam is revolved with its shaft the block and table will be retracted, and when the highest point of the cam has passed the block the latter will swing forward and will strike upon the lower portion of the cam. (Shown at 14^a.) Suitable guiding or balance wheels 17 are mounted upon the cam-shaft, through which power may be transmitted. The vertical springs 3 and the suspending-link 12 allow the free movement of the tables as actuated by the cam.

In order to distribute the pulp upon the tables, the distributing-box 9 receives the pulp from the battery through a separator 23, disposed above box 9. Within the separator are diverting-gates 18, with means for turning them so that the heavier portion of the pulp will pass directly into the portion 23^a and be delivered through a pipe 24 into one side of the distributing-box 9. The lighter segregated portion being diverted by the gate 18, passes on through a pipe 25 into the second portion

of the box, the latter being divided longitudinally by a partition 9^a and having a perforated bottom, as shown in Fig. 1. The lighter material is delivered upon the second and oppositely-inclined table. The character of the pulp thus delivered upon the two tables determines the angle of transverse inclination which shall be given to each table. The pulp flowing outwardly and transversely from the distributing-boxes reaches the riffles or channels, which are formed along the sides of the tables diagonally to the direction of reciprocation of the apparatus, and the heavier and valuable sulfurets are retained in these riffles, while the concussive movement of the tables gradually transfers them toward the discharge end, where the sulfurets will be received into boxes 19, which are fixed across the ends of the tables at this point. Along the sides of the tables, either supported from the tables or from the floor, are the pulp-boxes 20, into which the lighter and waste material overflows and by which it can be conveyed to any desired discharge-point. Water-pipes disposed as shown at 21, with suitable controlling cocks or valves, as at 22, serve to supply the requisite amount of clear water to flow over the tables during the operation. The divergence of the tables, in conjunction with their transverse inclination and the parallelism of the riffles or channels 8 with their outer horizontal edges, brings these channels nearer to the center at one end than they are at the other. Consequently the more nearly level the upper edges are the channels will decline more from the narrower toward the wider end. This longitudinal inclination may be regulated by the suspending-link 12 and moving device 13, previously described, and this adjustment is common to both tables, while the transverse adjustment is independent, as previously described.

By subdividing and segregating the pulp and working it upon the two-part table I am enabled to work more and heavier pulp and to avoid the use of an excess of wash-water on account of the interval between the ends of the riffles. The pulp is also prevented from banking by reason of the transverse inclination and the reverse longitudinal inclination of the table in conjunction with disposition of the sectional staggered riffles running diagonally to the direction of bump. Since the upper edge of the table is normally lower at the feed end, the tendency of the pulp on leaving the discharge end is to gravitate toward that end of the table; but the heavier portions catching in the riffles, which are approximately in horizontal planes, are gradually worked toward the discharge or wider end of the machine through the successive concussions of the cam. The constant bumping tends to progress the sulfurets in the line of bump and diagonally to the line of the riffles. This progressive movement is intermittent and more or less zigzag in its course, since with each impulse of the cam the sulfurets are lifted from the riffles, and on the return movement of the tables the sulfurets settle back part of the distance previously lifted. Owing to the staggered intervals in the riffles, the moving sulfurets are further broken up by passing gradually from a lower to a higher riffle. This is what is meant when it is said that the pulp is prevented from banking against the riffles, as in other types of machines employing riffles parallel or at right angles to the line of reciprocation of the table. Before being discharged the sulfurets are subjected to the wash from pipes 21, so that when finally delivered into troughs 19 they are clean and dry. The gangue and wash-water pass over the sides of the tables into troughs 20.

By disposing the concussive mechanism beneath and within the table I economize space, bring the concussive point more nearly to the center of the machine, and the shape of the cam allows a quicker concussive movement than would be possible if the concussion-block was allowed to strike an independent stop instead of a part of the cam itself.

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

1. A concentrating-table diverging from the head end and consisting of a plurality of independent tables, having their inner edges contiguous and hinged in substantially the central longitudinal line of the machine, and declining outwardly therefrom, their outer edges diverging from the head end toward the other end and having riffles parallel with said edges and diagonal to the line of blow given the table, means for supporting said tables, and means for independently adjusting their transverse inclination.

2. A concentrating apparatus consisting of a pair of tables having their inner edges contiguous and hinged in substantially the longitudinal central line of the machine, said tables declining outwardly therefrom, having their outer edges divergent, so that the tables increase in width from one end toward the other, riffles parallel with the outer edges and diagonal to the line of concussion given the table, means for suspending the tables and means for regulating the inclination from one end to the other, and a mechanism by which longitudinal concussive action of the table is effected.

3. A concentrating apparatus consisting of a pair of tables diverging from one end toward the other having their inner contiguous edges hinged along substantially the longitudinal central line of the machine, means including sliding wedges and adjusting-screws under the lower edges of the tables by which the transverse inclination of the tables may be independently regulated, means by which the tables are suspended and the longitudinal inclination regulated, and mechanism by which a longitudinal concussive motion of the tables is produced.

4. A concentrating apparatus consisting of a pair of tables made wider at one end than the other having their inner edges hinged contiguous to each other and hinged along substantially the longitudinal central line of the machine, said tables having their outer edges declining transversely therefrom, riffles parallel with the outer edges of the tables, and comprising sectional staggered channels extending longitudinally of the table and diagonal to the line of the blow given said table, a distributing supply-box from which pulp is delivered upon the tables to flow over the riffles and mechanism by which a longitudinal concussive movement of the tables is effected whereby the heavier material is transferred along the riffles while the pulp is delivered transversely over the edges.

5. A concentrating apparatus consisting of a pair of divergent tables having their inner edges hinged contiguous to each other, and their outer edges declining therefrom, longitudinal riffles parallel with the outer edges of the tables, means for independently adjusting the transverse angles of the tables, mechanism by which the longitudinal inclination of the tables is simultaneously adjusted, mechanism by which a longitudinal concussive movement of the tables is effected, a pulp-distributing box, means contained therein, whereby pulp of different gravity is delivered upon the respective tables to be independently treated.

6. A concentrating apparatus consisting of inclined divergent and independently-adjustable tables having riffles parallel with their outer edges, means for adjusting the transverse and longitudinal inclination of the tables, a mechanism located within and beneath the tables whereby concussive longitudinal movement is effected, a distributing-box having gates whereby the heavier and lighter material are separated within the box, and discharge-openings to deliver the different grades upon the oppositely-inclined tables.

In witness whereof I have hereunto set my hand.

CHARLES HORACE SNOW.

Witnesses:
C. M. PAINE,
J. COLEMAN.