

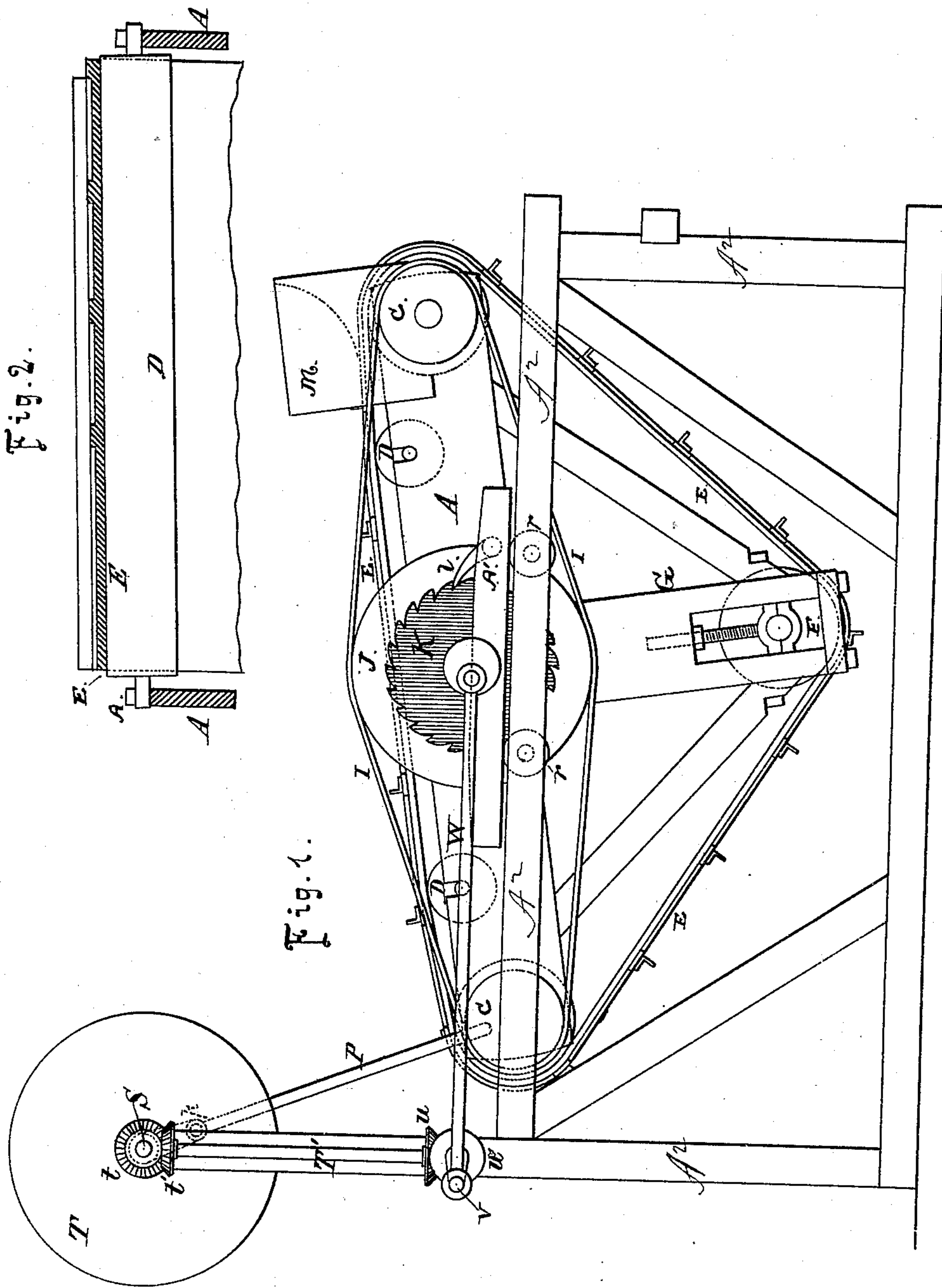
(No Model.)

2 Sheets—Sheet 1.

S. M. ATCHISON.
ORE CONCENTRATOR.

No. 268,351.

Patented Nov. 28, 1882.



Witnesses:

W. Voigt
W. H. Clark

Inventor:

S. M. Atchison

By his Attys, *Beane & Odell*

(No Model.)

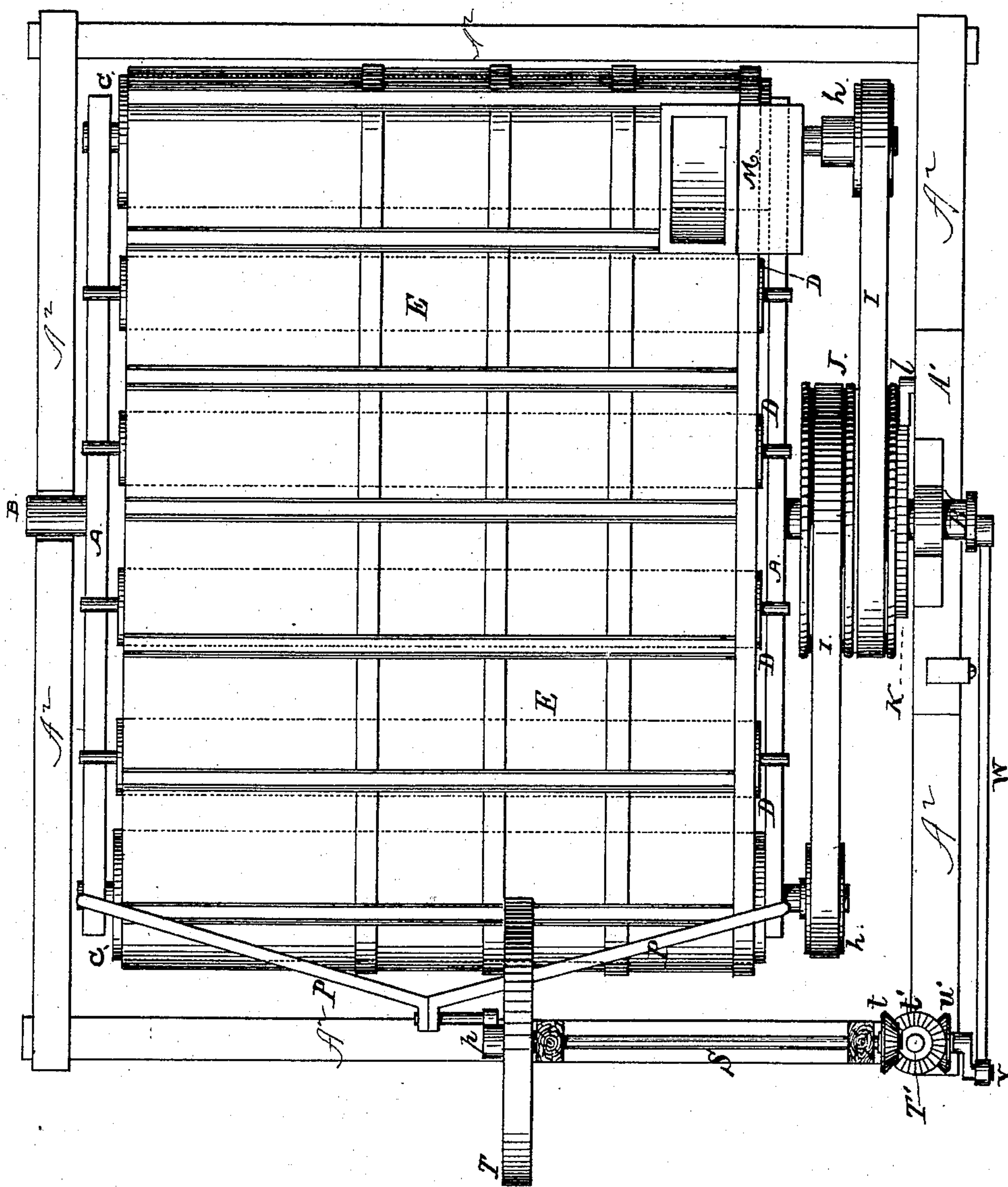
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Fig. 3.



Witnesses:

W. A. Clark
W. H. Voigt

Inventor:

S. M. Atchison

By his Attys, *Boone & Benson*

UNITED STATES PATENT OFFICE.

SILAS M. ATCHISON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO WILLARD F. ARNOLD, OF SAME PLACE.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 268,351, dated November 28, 1882.

Application filed May 25, 1881. (No model.)

To all whom it may concern:

Be it known that I, SILAS M. ATCHISON, of the city and county of San Francisco, in the State of California, have invented certain Improvements in Concentrators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to an improved concentrator for separating the heavy and valuable particles of ore pulp from the light and worthless portion.

It consists of an endless belt of india-rubber, canvas, or other material, mounted on a rocking frame and inclined transversely to its travel, so that the pulp which is fed upon its upper edge will flow down the incline in a direction at right angles to the travel of the belt. The belt is provided with riffle-bars which arrest the heavy particles, while the lighter portion passes down the incline and over its lower edge.

Referring to the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a cross-section. Fig. 3 is a plan view.

In a suitable frame, A^2 , is mounted a table or platform, A . This platform is supported on short shafts or trunnions $B B'$, the trunnion B having its bearing in the frame A^2 , while the trunnion B' has its bearing in the movable frame A' , which rests on rollers $r r$. This mounting of the table permits of a rocking motion being imparted to it, and also of a reciprocating movement of one side. This table is inclined toward one side, and it has a roller, C , at each end and several small intermediate rollers, $D D$. Around this frame I will pass an endless belt, E , and carry it down under an adjustable or tightening roller, F , which is supported below the middle of the frame by a hanger or arm, G , so that the belt can be tightened by adjusting the roller by means of a screw, as shown. The upper side of the belt will then be flat and inclined from one side of the frame to the other. Across the surface of this belt I arrange shallow riffles in either or both directions. To this table I will impart a rocking or tossing motion by a partial rotation of the frame on its trunnions in alternate

directions. At the same time I impart to the belt a traveling motion in one direction. This is done by the following means: I apply rag-pulleys h on the ends of the two end rollers, from each of which a belt or chain, I , passes around a large wheel, J , on the trunnion of the frame. On the side of this large wheel is a ratchet-wheel, K , with which a pawl, L , which is pivoted to a reciprocating bearing, A' , engages, so that when the frame oscillates in one direction the pawl will partially rotate the large wheel, and thus cause the endless belt to travel in the opposite direction intermittently. The reciprocating or rocking motion is imparted to the frame by means of connecting-rods $P P$, the upper united ends of which are applied on the wrist-pin of a crank, p , fixed on one end of a horizontal shaft, S . This shaft S has keyed on it a belt-pulley, T , and also a bevel spur-wheel, t , which latter engages with a corresponding wheel, t' , on a vertical shaft, T' . The bevel-wheels $u u'$ at the foot of shaft T' give rotation to a short shaft bearing on one end a crank, v , which acts through the medium of a pitman-rod, w , to impart a rectilinear reciprocating motion to the bearing A' , which is mounted on rollers $r r$. (Shown in Fig. 1.) It will be seen that the apron-carrying frame A not only receives a vertical vibrating motion, but it also receives at one side a horizontal vibrating motion, thereby effecting a most complete agitation of the pulpy material fed upon the apron and a separation of the metallic atoms from it.

The pulp will be fed upon the upper corner of the belt at the point where it passes up over the end roller, D , from a box, M , and it will then flow down the incline surface of the belt, being stirred and agitated by the rocking motion, so that the sulphurets and heavy particles will settle to the bottom and be caught by the riffles, while the lighter portion passes down and over a spout at the lower edge of the table or belt. At the same time the traveling motion of the belt will carry the retained heavy particles around underneath the table and down under the lower roller, where it will pass through a tank of water, which will wash off and remove the heavy particles.

I am aware that an endless belt with transverse riffles and a ratchet and pawl for operating the same is not new.

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

1. The combination of a supporting-frame, a frame pivoted thereto, an endless apron having riffles arranged transversely across its surface, a ratchet and pawl for imparting an intermittent traveling movement to said apron, and a feed-box mounted on the pivoted frame, substantially as described.

2. The combination of a supporting-frame, a frame pivoted thereto, means for rocking the pivoted frame, and an endless traveling apron which is inclined transversely to the direction of its travel, substantially as described.

3. The combination of a supporting-frame, a frame pivoted thereto, an endless apron having riffles arranged across its surface, a ratchet and pawl for imparting an intermittent travel-

ing movement to said apron, a movable carriage or support on which one end of the shaft B has its bearings, and mechanism for imparting a reciprocatory motion to said carriage, substantially as described.

4. The combination of the supporting-frame, the apron-carrying frame pivoted thereto, the driving-shaft, the crank thereon, the rods connecting the apron-carrying frame with said crank, an intermediate crank and crank-shaft, a rod connecting one trunnion of the apron-carrying frame with said intermediate crank, and mechanism connecting said intermediate crank with the driving-shaft, substantially as described.

In witness whereof I have hereunto set my hand.

SILAS M. ATCHISON.

Attest:

WM. F. CLARK,

EDWARD E. OSBORN.