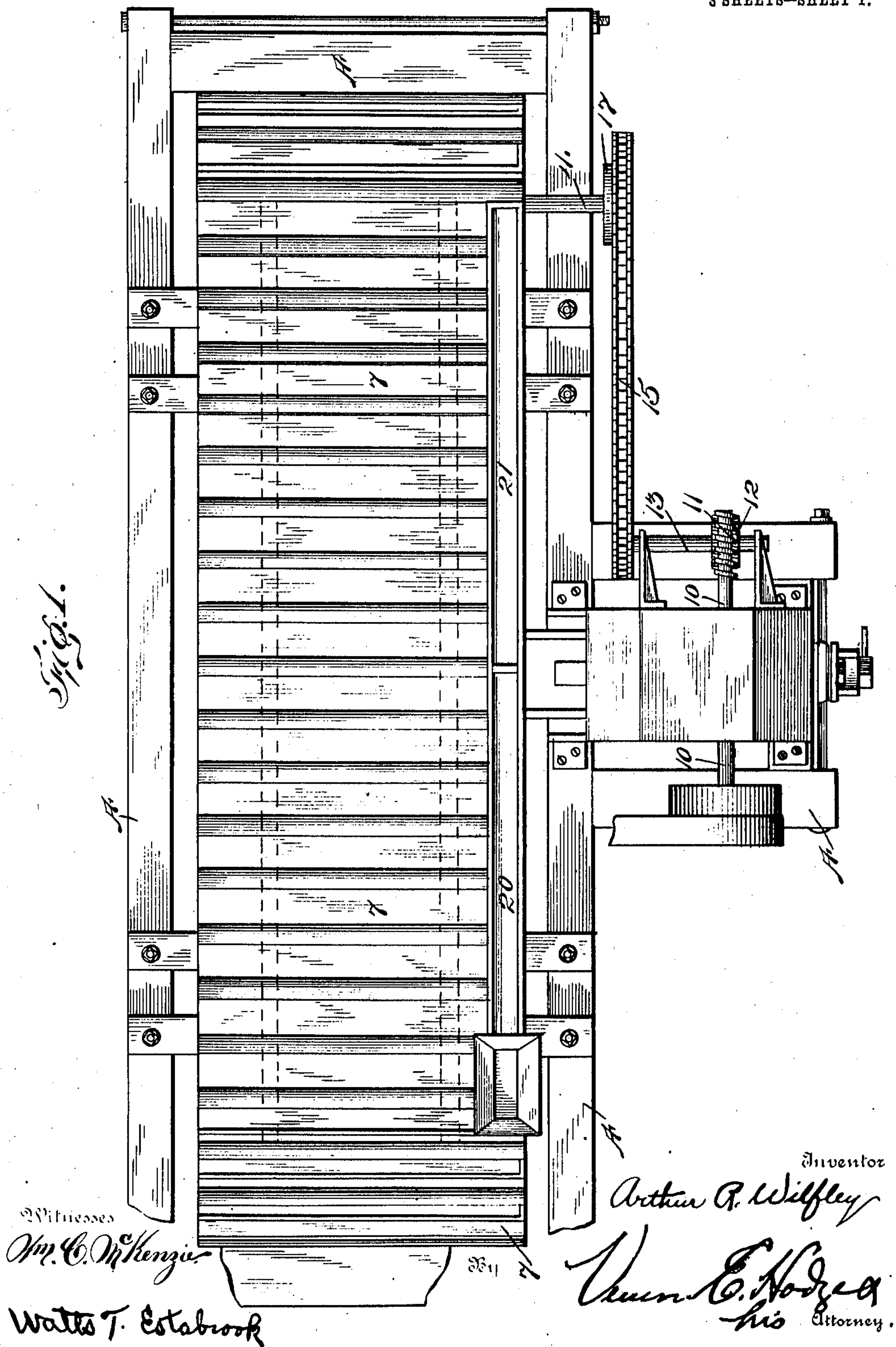


A. R. WILFLEY.
CONCENTRATING TABLE.
APPLICATION FILED MAY 15, 1903.

970,283.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

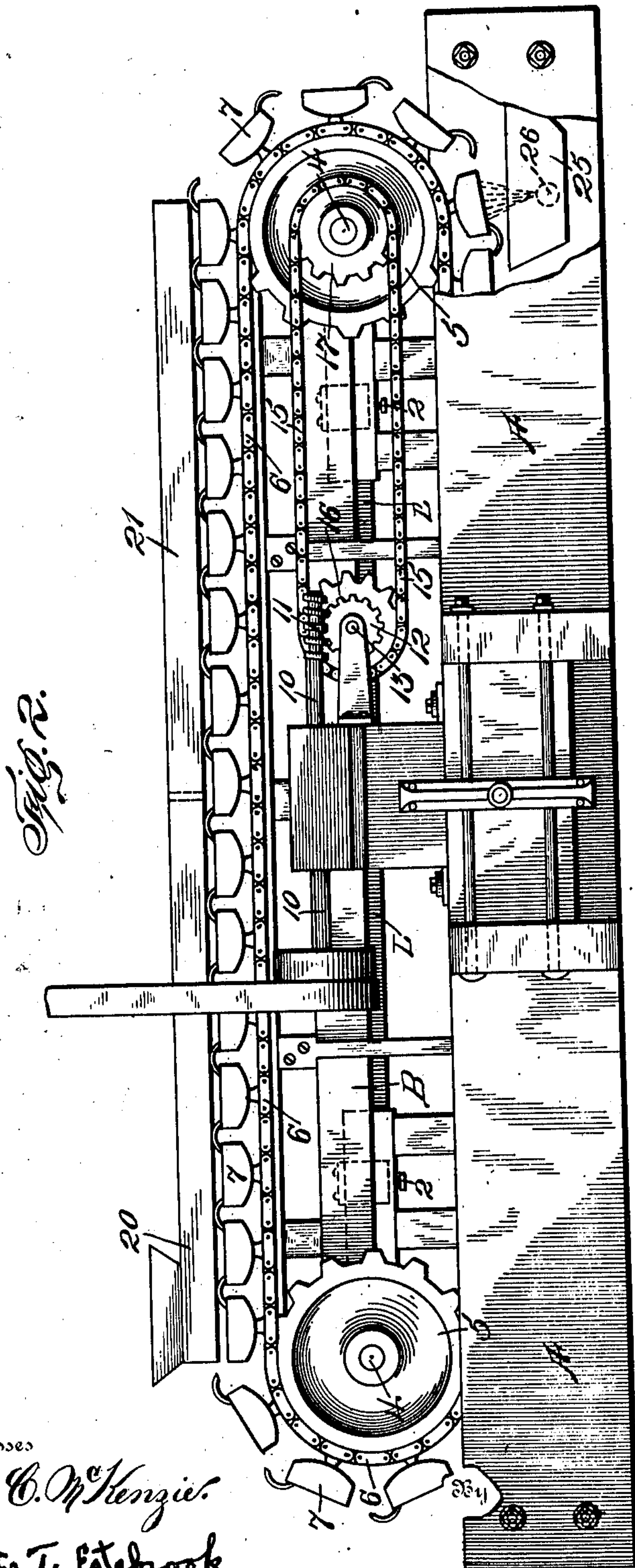


Fig. 2.

Witnesses

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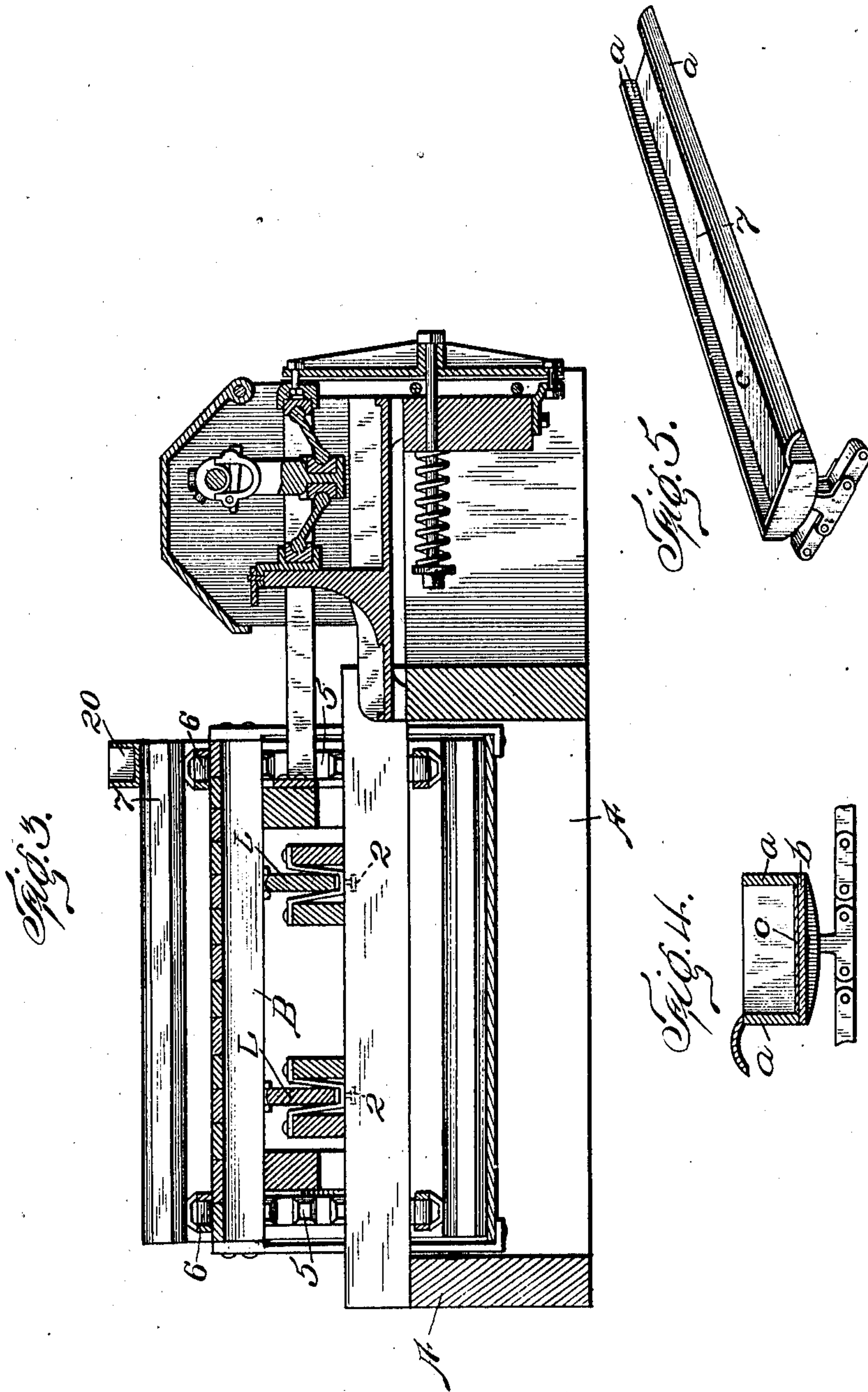
James E. Hodges
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Patented Sept. 13, 1910.

3 SHEETS—SHEET 3.



Witnesses

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By

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UNITED STATES PATENT OFFICE.

ARTHUR R. WILFLEY, OF DENVER, COLORADO, ASSIGNOR TO THE MINE AND SMELTER SUPPLY COMPANY, OF DENVER, COLORADO, A CORPORATION.

CONCENTRATING-TABLE.

970,283.

Specification of Letters Patent.

Patented Sept. 13, 1910.

Application filed May 15, 1903. Serial No. 157,287.

To all whom it may concern:

Be it known that I, ARTHUR R. WILFLEY, a citizen of the United States, and a resident of Denver, in the county of Denver and State of Colorado, have invented a new and useful Improvement in Concentrating-Tables, of which the following is a specification.

My invention relates to an improvement in concentrating tables, and it is of the general type commonly known as a "vanner," in which the concentration takes place on a moving belt or surface; and the primary object of my present invention is to treat tailings from tables of the class known as the "Wilfley" or tables which move the pulp along their surface by inertia. With this class of table the material of greatest specific gravity, and also material moved the most rapidly by their own inertia are given the advantage. This results in catching practically all of the coarse mineral, most of the fine, and some coarse gangue, that is to say, the gangue which it does catch is all coarse because it travels the fastest by inertia. A certain amount of very fine mineral having specific gravity to settle, but not the shape or size to move forward is finally disturbed and lost in the tailings. Now, the present type of belt machine works in the opposite direction, and fine material having a specific gravity to settle, but not the shape or size to progress by inertia, will settle upon the surface of the canvas or other material, while the larger, lighter particles will be progressed over it. With the Wilfley type of table to prevent such grains from accumulating on the table, the table must be run with a strong motion to suspend them so that the table will not become loaded with such minerals, but with the present belt machine, I propose to run it at just such speed as will allow such a particle to rest quietly upon the canvas, while the lighter material is being progressed over it. The travel of the main belt is from the end where the pulp is fed on, toward where the wash water is introduced, the wash water being employed to remove the last particles of fine gangue which will not move by inertia.

In addition to the foregoing, my invention contemplates a moving surface with a secondary movement whose tendency is to

progress the material being treated in another direction.

My invention further consists in certain novel features of construction and combinations of parts which will be hereinafter described and pointed out in the claim.

In the accompanying drawings, Figure 1 is a plan view, Fig. 2 is a view in side elevation, Fig. 3 is a transverse vertical section, and Figs. 4 and 5 are detail views of the troughs.

In the particular exemplification of my invention illustrated, A represents the base or framework of the concentrator, and B, is the table frame, preferably supported on the base by means of rockers L, L, beneath which latter are set screws 2, 2 adapted to raise or lower the rockers, to tilt or level the table. This table frame in actual construction is intended to be about seven feet wide by twelve feet in length, and is built up of suitable stringers and cross ties, on top of which is screwed a deck of narrow boards to afford a smooth surface. Shafts 4, 4, are journaled in the opposite ends of the table frame and sprocket wheels 5, 5 are secured thereto. Sprocket chains or link belts 6, 6, are carried over these sprocket wheels and these chains carry a series of troughs 7, 7 which are disposed side by side and transversely of the table and which, together with the chains, constitute an endless belt, which moves slowly over the deck carried by the sprocket wheels at each end. These troughs are preferably about ten inches wide and seven feet in length and are each made of two strips of wood *a, a*, say an inch by an inch and a half in cross section and seven feet in length, with slats of wood *b, b*, a quarter of an inch thick by three inches wide and ten inches long, nailed across them, and the bottom of each trough is lined preferably with canvas *c*. The moving belt thus constructed and constituted rests upon this deck or surface and is dragged along on it without any rollers at the ends, the sprocket wheels performing the function of the rollers. The underside of the belt is supported on two stringers which are fastened to the shaking table frame so that even this portion is not supported on rollers and the entire belt is carried by the chains. In the construction shown a differential toggle movement is set

on the base at one side and connected to the center of the table, or at the side of the table frame having the closed ends of the troughs and opposite the open ends. Thus the reciprocating motion of the table is cross-wise the shaking frame and endwise of the troughs, the progression of the material being from the closed end of the trough toward the open end and the peculiarity of the movement being that the outward stroke is first slow and then accelerated and the return stroke is first quick and then retarded thus aiding this outward progressive movement of the material.

On one end of the main drive shaft 10, the worm 11 is located, which worm engages a worm gear 12 on the counter shaft 13 which extends at right angles to the main drive shaft 10, and parallel with the belt shafts on the table or shaking frame. This counter shaft 13 and one of the shafts which carries the belt are connected by a chain belt 15, which extends over sprocket wheels 16 and 17, keyed to the counter shaft and belt shaft, respectively, which imparts slow and constant movement to the main belt, the chain drive allowing the table a reciprocating motion while the counter shaft remains stationary.

Returning to the troughs, it may be added that they are set practically level, or with slight inclination toward the open end. The pulp is fed along the side for about half the length of the table in the pulp box 20, the balance of the distance being supplied with a box 21 for wash water. The troughs being closed at this side of the table, the water necessarily flows toward the other side and hence the progression of movement being in the same direction, the gangue is carried that way. Thus it will be seen that large pieces of gangue, as large as one's fist

might be progressed over the side of the table, while extremely fine particles of mineral would be carried along by the moving surface of canvas or what not. And this is in contradistinction to other machines in which the gangue is removed by a current of water or by some mechanical device for scraping it off of the top, whereas in my invention the gangue is progressed, by its inertia over the top so that a very slight current to the water is necessary.

As a simple means for insuring the removal of the concentrates from the troughs, a concentrate box 25 is located beneath the discharge end of the table and a spray pipe 26 just above this box discharges water into the inverted troughs as they pass above it, thus washing out all of the mineral, which drops into and is caught by the concentrate box.

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

In combination, a slimes concentrating belt composed of transversely disposed trough sections open at one end, means for moving the belt in the direction of its length, means for imparting reciprocation to the belt initially slow and increasing to fast in the direction toward the open ends of the troughs, and initially fast and decreasing to slow in the reverse direction, means for feeding slimes to the heads of the troughs, and means for feeding dressing water to said troughs.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ARTHUR R. WILFLEY.

Witnesses:

E. B. BADGER,
M. A. DINSMORE.