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CONCENTRATING TABLE.

APPLICATION FILED AUG. 13, 1906.

900,285.

Patented Oct. 6, 1908.

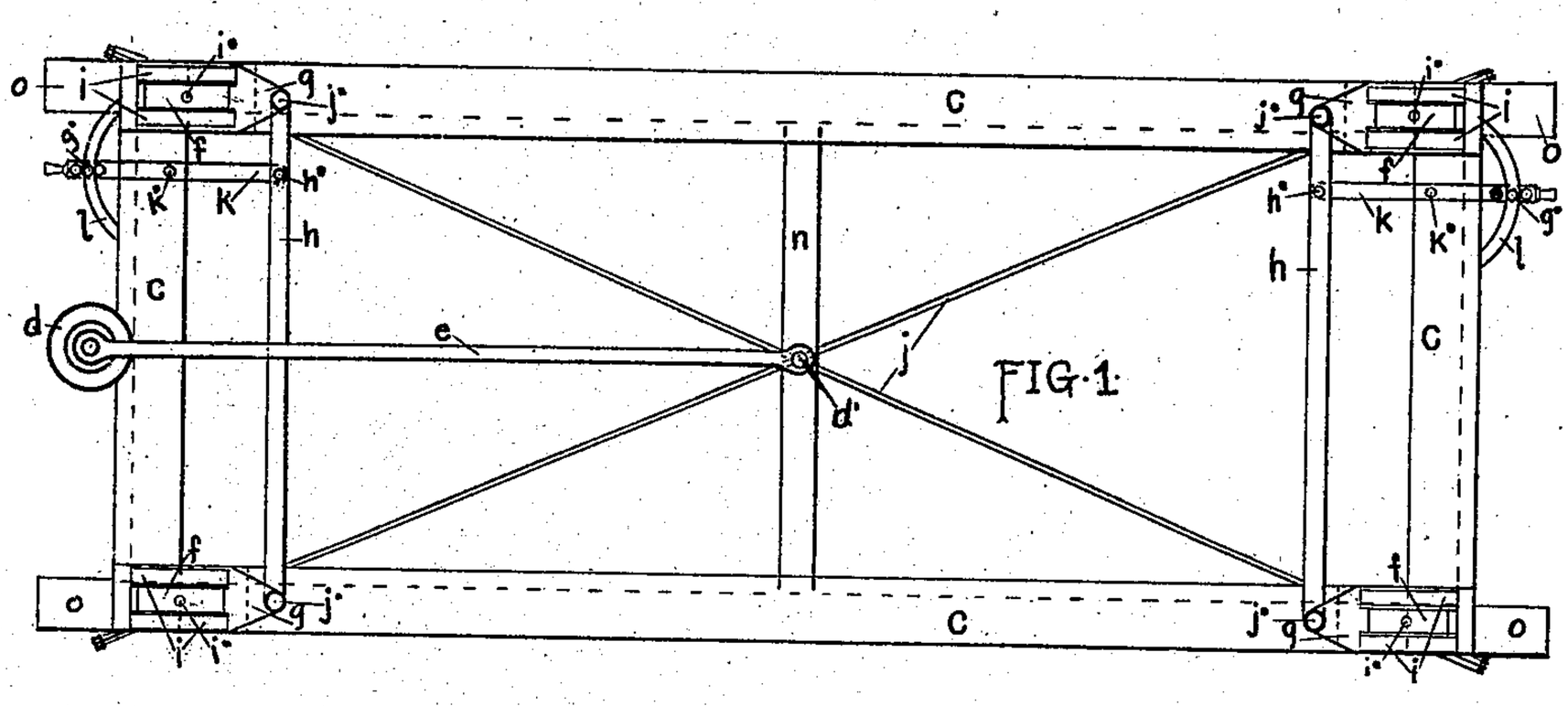

FIG. 1.

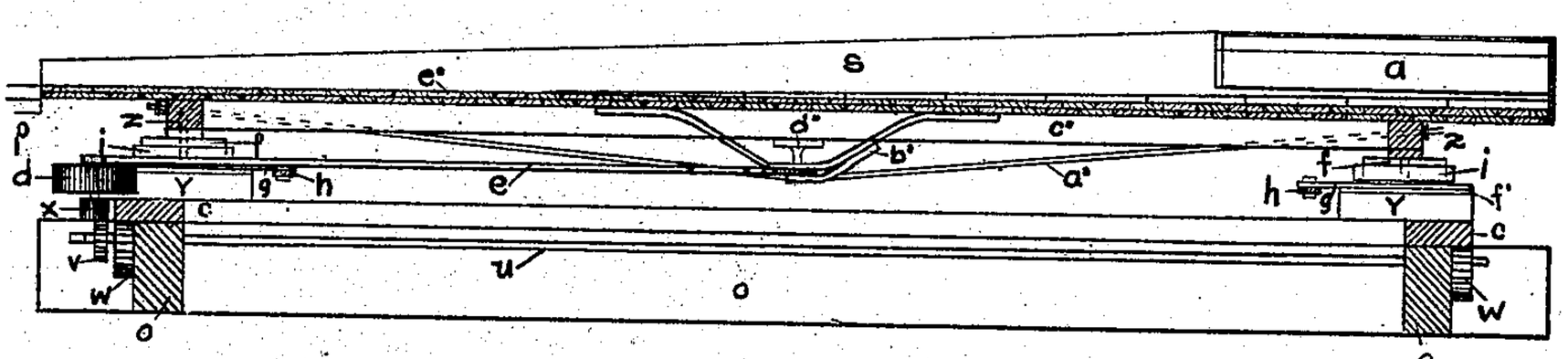

FIG. 2.

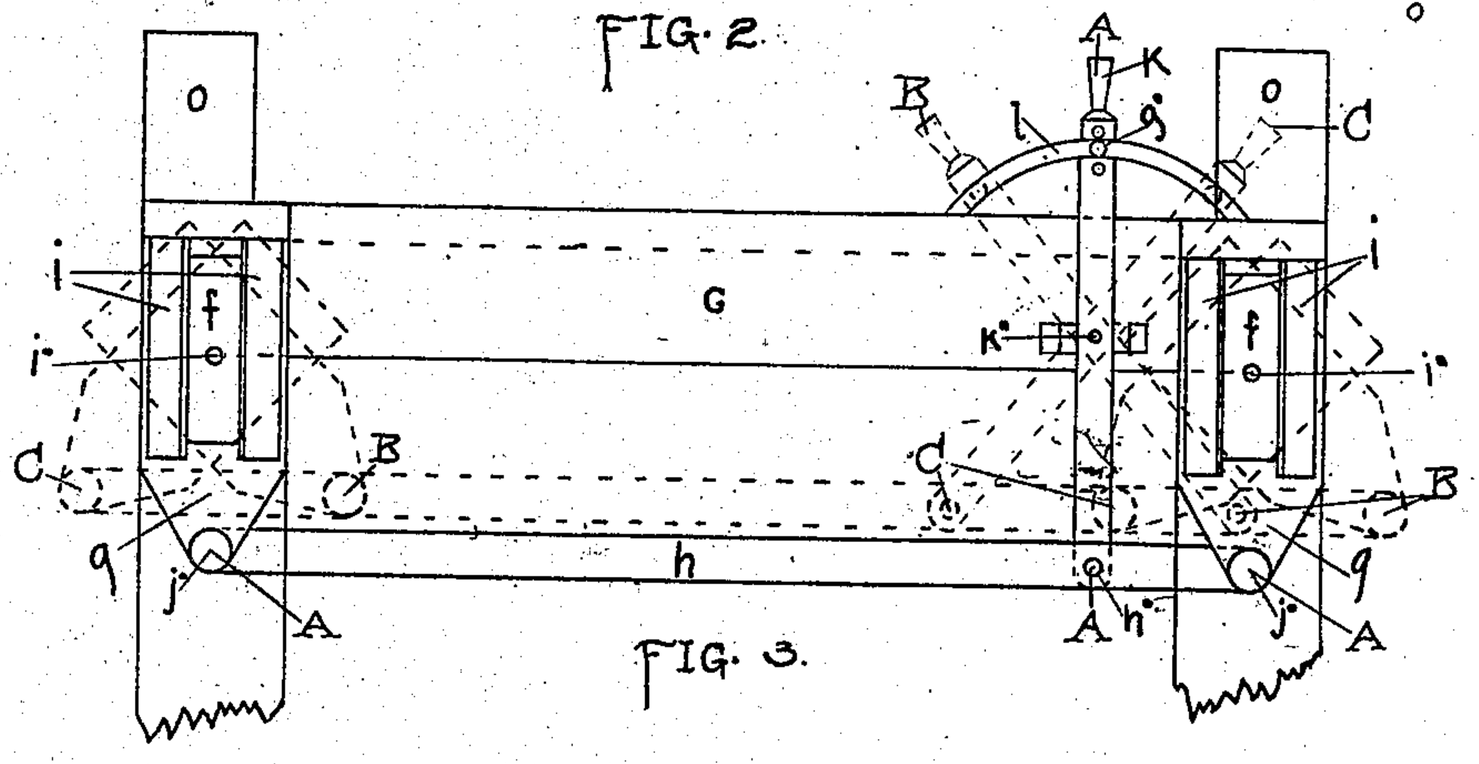

FIG. 3.

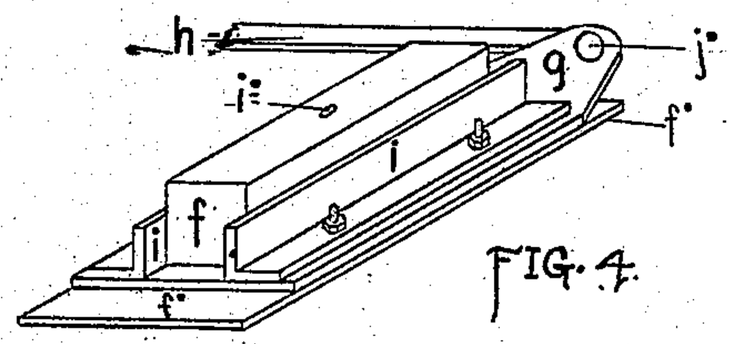

FIG. 4.

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CONCENTRATING-TABLE.

No. 900,285. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed August 13, 1906. Serial No. 330,396.

To all whom it may concern:

Be it known that we, ALBERT M. KEMP, MERTON W. LOOMIS, and JOSEPH E. FITZWATER, citizens of the United States of America, residing at Denver, in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Concentrating-Tables, and Particularly in the Actuating Mechanism for Concentrators; and we do declare the following to be a clear and accurate description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The accompanying drawings and the markings thereon form a part of these specifications.

Our invention relates to improvements in actuating mechanism for concentrators and it consists of the details and combinations hereinafter described and claimed; all of which will be fully understood by referring to the accompanying drawings, in which is illustrated the workings thereof.

The object of our invention is to provide an ore separating or concentrating table with simple and efficient mechanism which shall have in addition to the parts usually found in ore concentrating tables, certain parts which give to the machine the reciprocating motion generally used in ore concentrating tables and in addition thereto, certain side motions at each end of the table. These side motions may be in the same direction at each end of the table or they may be in opposite directions at opposite ends or a side motion in either direction may be used at one end of the table and a reciprocating longitudinal motion at the other end. These side motions are reciprocating and may be increased or diminished in extent and intensity as preferred. By the use of these motions through this mechanism the deck is caused to oscillate with a distinct stroke toward the top or feed side with a slow indistinct return stroke, or with a distinct stroke toward the bottom or discharge end of the deck, thus causing a more continuous and complete agitation of the water as it flows across the deck. This greater agitation of the water causes a more rapid and perfect separation of the silica and other gangue matter in the ores, from the mineral values, and the minerals of different specific gravity from each other.

This mechanism may be used upon any concentrating table with any form of deck. The power may be applied to the table in any manner desired.

In the drawings, Figure (1) is a plan view of the deck supporting frame and our improved apparatus upon which the deck is placed. Fig. (2) is a side elevation of the table or concentrator complete, portions being shown in longitudinal section. Fig. (3) is a detail plan of the power or tail end of the table or concentrator as seen in Fig. (1) on an enlarged scale and showing the different positions of the mechanism of this machine, when in operation or when moved. Fig. (4) is a perspective of the pivoted slides of Figs. (1) and (3).

Similar references indicate corresponding parts in each figure.

Referring to the drawings by letter, *a*, *s*, designates the deck or top of the concentrator, *e'*, the floor of the deck which rests upon and is supported by cross-bars *z* under each end of the deck. This cross bar rests at each corner of the deck upon an iron block *f*.

a' is a stay and support for frame of deck, connecting the cross bars *z*.

c' is the longitudinal side of the frame connecting the cross bars *z*.

d' is a bracket attached to the frame members *c'*. This bracket is joined by a connecting rod, *e*, to an eccentric on pulley *d*, which may be used to give the motion to the deck.

b' is a stay or support for bracket *d'*.

f is an iron block upon which rests the cross bar *z* and frame members *c'*, and is the support of this part of the frame which supports the deck. The cross bar *z* is pivotally connected to *f* at *i'*. The reciprocating movements of the deck are by this pivot guided to move in the direction of the movement of blocks *f*, and the frame and deck are thus prevented from sliding down in the direction of its movement. The blocks *f* work in guides *i*, which are held in place by being bolted to steel plate *g*. Steel plate *g*, is pivoted on steel plate *f'*, and is free to move on said pivot. Steel plate *f'* is stationary and is bolted to wooden block *y*, which is, in turn bolted to frame *c*. Frame *c* rests upon frame *o*.

h is a cross bar which laterally connects

steel plates *g* at each end of the frame, and moves the two steel plates simultaneously. Lever *k* is fastened to cross bar *h*, at *h'*, and to the frame *c*, at *k'*, and is held in position by a set screw *g'*, on arc *l*.

A is the position of the lever *k*, cross bar *h*, and iron block *f*, when in motion parallel with deck.

Dotted lines B, show the position of lever *k*, cross bar *h*, and iron blocks *f*, when lever on power or tail end of table is moved to right or towards the lower or discharge side of the table.

Dotted lines C, show the position of lever *k*, cross bar *h*, and iron blocks *f*, when the lever on same end, is moved to left or towards the upper or receiving side of the table.

By moving lever *k*, from position A, to position B, cross bar *h*, is moved in opposite direction, from the handle of the lever. Cross bar *h*, moves steel plate *g*, guides *i* and blocks *f*, so that blocks *f* may be moved to any angle desired from that at position A, to that at position B, or any angle to that of forty five degrees from position A.

Blocks *f*, in position B, move in guides *i* in a direction oblique to line of movement in position A. In position C, blocks *f* move at an angle oblique to line of movement in position A, and up to an angle of ninety degrees from position B. This movement of blocks *f* carries deck *a*, *s* in the same direction that the blocks *f* move. When blocks *f* are in position A, the deck is given a longitudinal horizontal movement. When blocks *f* are in position B, the deck is given a side movement towards the lower or discharge side of the table. When in position C, it is given a side movement towards the upper or receiving side of the table.

When the table is operated in position A, the deck is given a longitudinal motion and the minerals and gangue matter are moved towards the power end of the table or the tail end of the deck. When the machine is operated in position B, the minerals and gangue matter are given an accentuated motion towards the discharge or lower side. By this movement the gangue matter, silica or other substance, is speedily separated from the mineral values and passed over the table to the discharge side, while the mineral values are moved on towards the end of the deck. The motion when operated from position B, accelerates the separation of the gangue matter from the mineral values over the motion which it has when operated from position A.

When the table is operated from position C, the heavier matters, especially the minerals, are given an accentuated motion towards the upper or receiving side of the deck, and the lighter particles, or gangue matter, driven to the lower side of the deck.

By moving lever *k* from position A, or B, to position C, cross bar *h*, steel plates *g*, guides *i*, and blocks *f*, are so moved that blocks *f* move in a direction at right angles to the direction in which they move at position B.

Blocks *f*, moving in position A, move the deck lengthwise with the table and give it a horizontal longitudinal motion. Blocks *f*, moving in position B, or in any position from position A, to position B, give the deck a side motion which is increased as the position of the blocks *f* reaches position B. Blocks *f*, moving in position C, or in any position from position A, to position C, give the deck an opposite motion from that which it has when moving in position B, or when approaching this position from position A. The movement from positions B, and C, are united with the longitudinal motion of the deck; thus the deck is given a longitudinal and side motion at the same time.

By the use of these improvements the deck is given nine distinct combinations of motions as follows: 1. Each end of deck with blocks *f* moving in position A. 2. Each end of deck with blocks *f* moving in position B. 3. Each end of deck with blocks *f* moving in position C. 4. Blocks *f* at head end in position A, and at tail end in position B. 5. Blocks *f* at head end in position A, and at tail end in position C. 6. Blocks *f* at head end in position B, and at tail end in position A. 7. Blocks *f* at head end in position C, and at tail end in position A. 8. Blocks *f* at head end in position B, and at tail end in position C. 9. Blocks *f* at head end in position C, and at tail end in position B. The intensity of the motion in these positions and the length of the stroke are diminished as the lever *k* and the position of the blocks *f* are changed from positions A, B, or C, towards either of the other positions.

The frame C may be tilted as desired by eccentrics W, W, mounted near opposite ends of a rod *n*, journaled near one side of the frame *o;* the eccentrics being held in any desired position by a ratchet *v*, and a pawl (not shown), as will be readily understood from Fig. 2.

The position most favorable for the concentration of the particular kind of ore under treatment is readily ascertained by actual experiment. The simple and effective means of adjustment herein furnished provides a table which will more effectually concentrate almost any kind of ore, or separate the different ore values, than other types of machines.

The capacity of a concentrator using our mechanism is equal to and often greatly in excess of that of other kinds of machines.

Slight changes may be resorted to in the several parts described and in their arrangement without departing from the intent and

scope of our invention. We therefore do not wish to limit ourselves to the exact construction set forth herein.

Having thus described our invention what we claim as new, and desire to secure by Letters Patent of the United States, is,—

1. In an ore concentrator, in combination, a table-frame, a plurality of guides pivotally mounted thereon and movable in a plane parallel thereto, blocks movably mounted in said guides and carrying a deck having an ore-concentrating surface, means for connecting said guides in pairs, adjustable levers attached to said frame and each of said connecting means, means for holding said levers in any desired position, and means for reciprocating said deck.

2. In an ore-concentrator, in combination, a deck having an ore-concentrating surface, a table-frame, a plurality of guide-carrying plates pivoted to said frame and angularly adjustable in a plane parallel thereto, means for simultaneously adjusting said plates, blocks pivoted to said deck and movable in said guides, and adjustable means for reciprocating said deck and blocks.

3. In an ore-concentrator, in combination, a table-frame, plates resting thereon and provided with guides, means for angularly adjusting a plurality of said plates and guides simultaneously in a plane parallel to the plane of said frame, blocks mounted to reciprocate in said guides and a deck having an ore-concentrating surface, pivotally secured to each of said blocks and movable therewith.

4. In an ore-concentrator, in combination, a table-frame, plates pivoted thereto and provided with guides, a deck having an ore-concentrating surface, blocks adjustably secured to said deck and movable in said guides, means for reciprocating said deck, and independently adjustable connecting means for said plates at each end of the table to angularly adjust said guides in a plane parallel to the plane of the frame, and cause the blocks at the same end of the table to move simultaneously in the same direction.

5. In an ore-concentrator, in combination, a deck having an ore-concentrating surface and means for reciprocating said deck, a table-frame, plates pivoted to said frame and provided with guides, said plates and guides being angularly adjustable in a plane parallel to the plane of the frame, blocks movable in said guides and pivotally attached to said deck, a cross-bar connecting plates at the same end of the table, a lever having one end attached to said cross-bar and an intermediate point thereof pivoted to said table-frame, and a clamp for holding said lever in any desired position.

6. In an ore-concentrator, in combination, a table-frame, and a deck mounted to reciprocate on said frame, said mounting means comprising guide-carrying plates pivoted to said frame, blocks movable in said guides and pivoted to said deck, cross-bars connecting said plates and adjusting levers connected to said cross-bars to adjust said guides in a plane parallel to the plane of the frame.

7. In an ore-concentrator, in combination, a table-frame, a deck having an ore-concentrating surface, plates movably mounted on said frame and having guides, blocks movably attached to said deck and adapted to slide in said guides, means for retaining said guides in parallel relation and means for simultaneously adjusting the angle of pairs of said guides in a plane parallel to the plane of the table-frame.

8. In an ore-concentrator, in combination, a table-frame, a deck having an ore-concentrating surface, a plurality of adjustable guides at each end of said frame, means for maintaining in parallel relation the guides at the same end of the frame and endependent means at each end of the frame for angularly adjusting the sets of parallel guides in a plane parallel to the plane of said frame.

9. In an ore-concentrator, in combination, a frame, a deck having an ore-concentrating surface, a pair of connected parallel guides adjustably mounted at each end of said frame, a pair of blocks adjustably attached to each end of said deck and slidably mounted in said guides, means for reciprocating said deck, and independent means for angularly adjusting the guides at each end of the table in a plane parallel to the plane of the frame, to move the opposite ends of the deck in non-parallel lines.

10. In an ore-concentrator, in combination, a tilting frame, a deck having an ore-concentrating surface, means for reciprocating said deck, and independently adjustable mountings at each end of said frame, each mounting comprising a pair of plates pivotally attached to said frame and having guides adjustable in a plane parallel to the plane of the frame, a pair of blocks pivoted to said deck and slidable in said guides, a cross-bar connecting said plates, a lever pivoted to said cross-bar and to the table frame, an arc mounted on the frame concentric with said last-named pivot, and means for clamping said lever at any desired point on said arc.

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