

(No Model.)

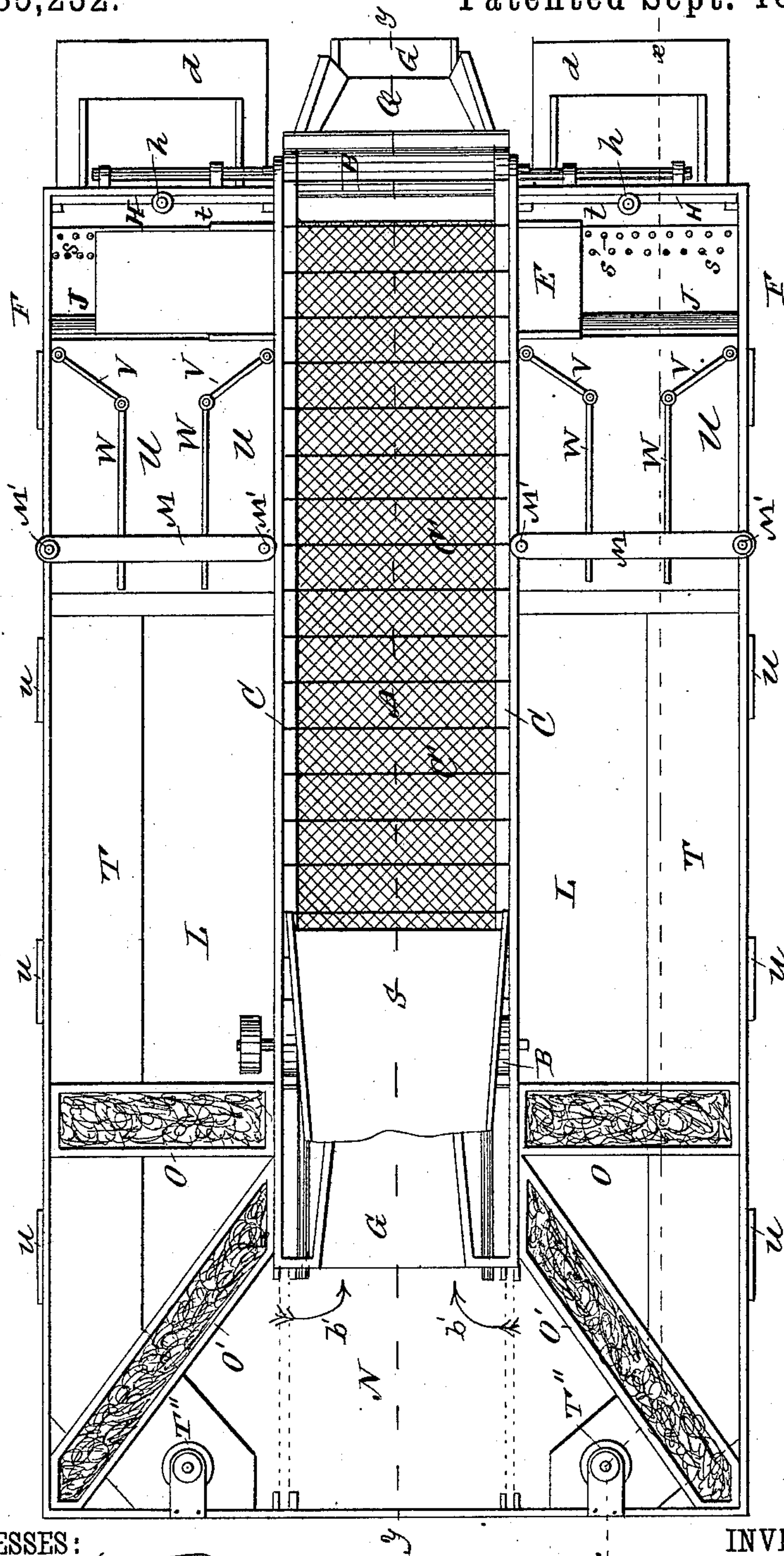
3 Sheets—Sheet 1.

A. D. CLARKE.
ORE CONCENTRATOR.

No. 285,232.

Patented Sept. 18, 1883.

Fig. 1.



WITNESSES:

Theo. G. Hoston.
C. Sedgwick

INVENTOR:

A. D. Clarke

BY

Munn & Co

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

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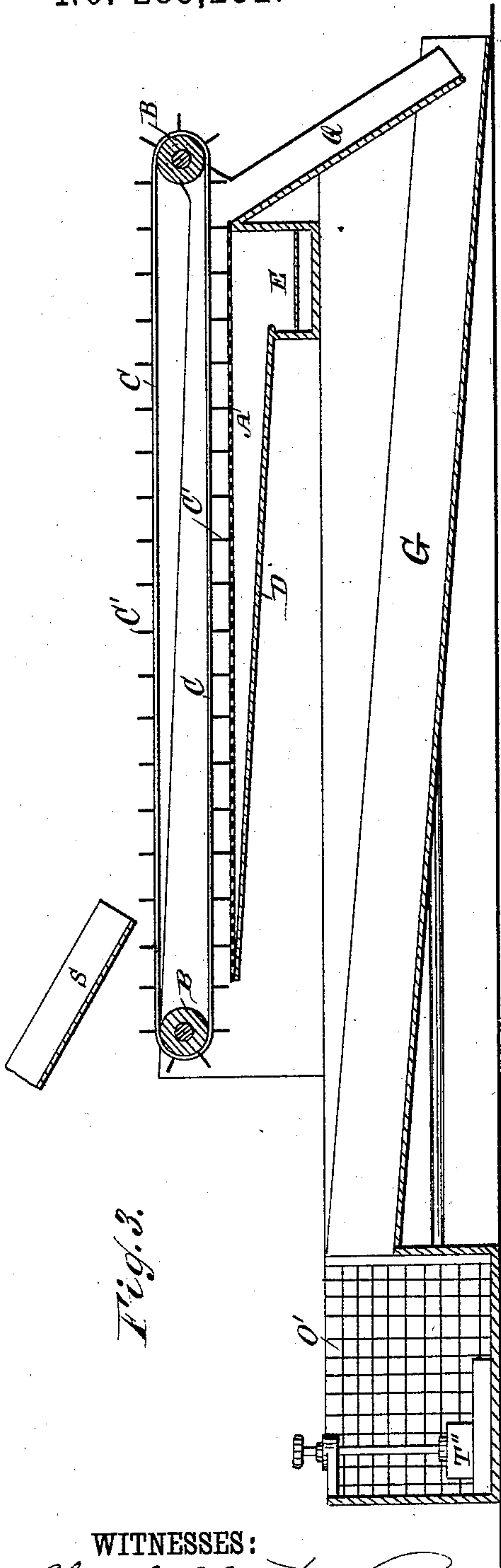


Fig. 3.

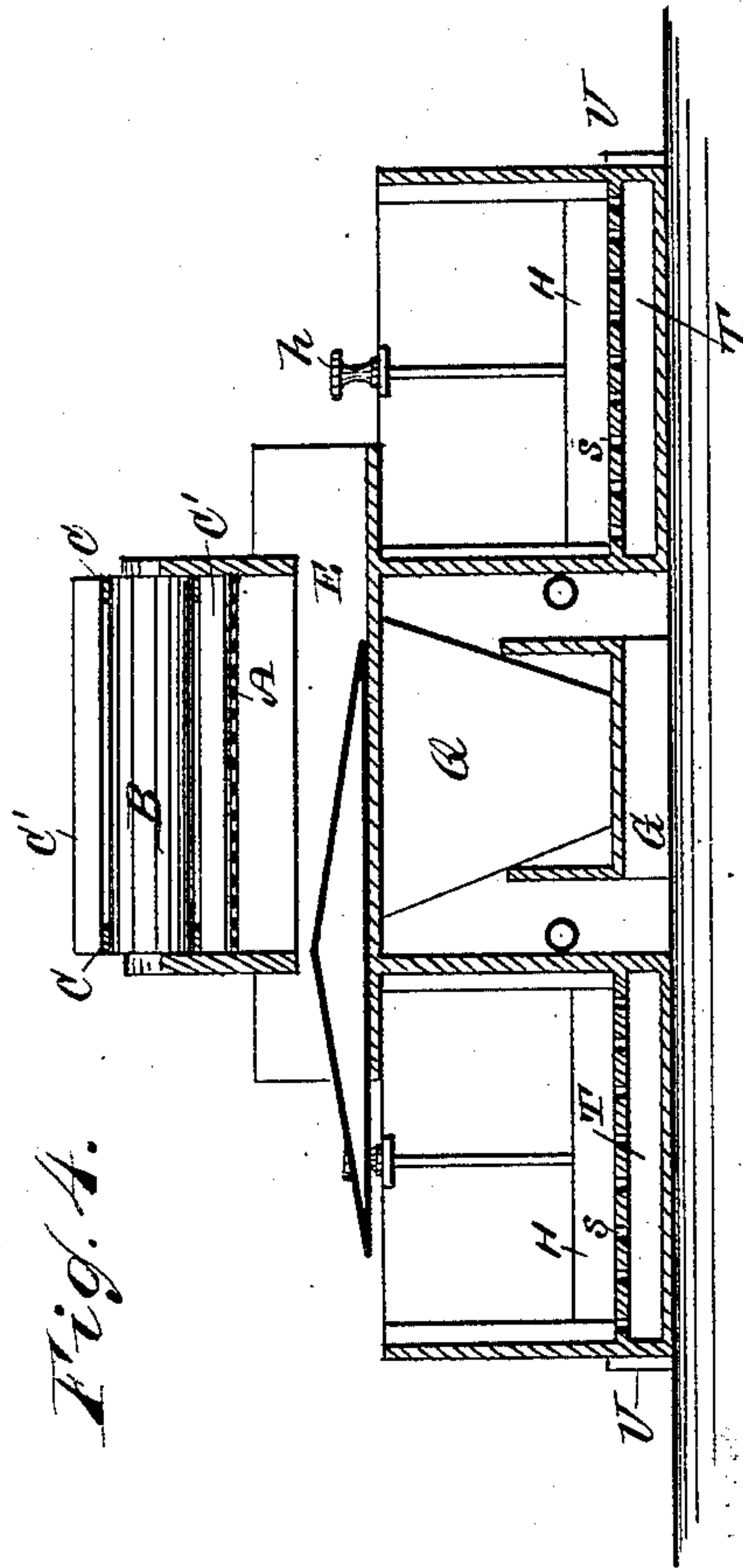


Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ALEXANDER D. CLARKE, OF NEW YORK, N. Y.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 285,232, dated September 18, 1883.

Application filed April 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER D. CLARKE, of the city, county, and State of New York, have invented a new and Improved Ore-Concentrator, of which the following is a full, clear, and exact description.

This invention has relation to improvements upon my ore-concentrator, the Letters Patent of which are numbered 276,775; and it has for its object to provide a new and improved device for concentrating ore in placer-mining, for washing out and separating the particles of gold, silver, &c., from the sand.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improved ore-concentrator, parts being broken away. Fig. 2 is a longitudinal sectional elevation of the same on the line *x x*, Fig. 1. Fig. 3 is a similar section taken on line *y y*, Fig. 1, and Fig. 4 is a cross-section taken on the line *z z* of Fig. 2.

The screen A, consisting of perforated plates, wire-netting, bars, or rods, is held over an inclined apron, D, the lower front end of which rests upon a transverse gutter, E, resting on or projecting over the adjoining sides of two boxes, F, at the sides of, parallel with, and below the screen A. Above each end of the screen A two drums or rollers, B, are journaled, over which endless belts or chains C pass, to which transverse blades or scrapers C' are attached at suitable intervals. The belt C is so located that the lower free ends of the downwardly-projecting blades C' can rest on and pass over the upper surface of the screen. Between the two boxes F a flume, G, is arranged, which is inclined from the rear toward the front end, and is below the apron D. The boxes F are provided in the bottoms of their front ends with longitudinal opening or slots *a*, which can be closed by vertical gates H, which can be operated by means of vertical screw-shafts *h*, or by any other suitable analogous devices. The bottom of each box F is inclined upward at an angle of about twenty degrees from the front toward the rear end. Behind each box F a box, L, of the same height

and width, is formed, and the rear ends of the boxes L are connected by a large transverse box, N, from the front of which the flume G extends to the front end of the entire apparatus. Cages O, made of rods, bars, slats, or other suitable material, are arranged and held transversely in the rear ends of the boxes L, and sage-brush, grass, bushes, or hay, through which the water can filter, is placed in the said cages. Like cages, O', filled in a like manner, extend diagonally from the rear ends of the boxes L to the corners of the transverse end box, N. A chute, Q, extends from the front end of the screen A down into the front end of the flume G.

T is a water-conduit which underlies the several chambers F, L, and N, the same being formed by the space bound by the bottom plate, T', of said chambers and a second plate, T'', and by the rear end of the concentrator and the forward end of an inclined partition-plate, presently described. The conduit extends the entire width and nearly the entire length of the concentrator. At its rear end it is provided in its top with an opening, which can be closed by a suitable valve, T'', which can be operated by a vertical screw-rod, or by any other suitable device. The front end of the conduit is formed by the inclined bottom J of the box F, which bottom is provided at its lower end—that is, at the floor of the box—with a slot, *t*, extending the entire width of the box F, the conduit T extending at its front end the entire width of the box F. Directly above the slot *t* the bottom J is provided with a series of apertures, *s*, through which water from the conduit T can pass up into the box F.

On the inclined bottom J a triangular or wedge-shaped box or frame, U, rests, which has its front end slightly beveled, and has its top horizontal, and the said box U can be moved into any desired position on the inclined bottom J—that is, at a greater or less distance from the lower end of the said inclined bottom—and accordingly the depth of the channel can be regulated, for if the box or frame U is moved in the upper end of the inclined bottom J the channel through which the water passes from the box F into the box L will be very shallow, and if the box U is

located nearer the lower end of the inclined bottom J the channel will be deeper. At the sides of the top of the box U, and at the front end of the same, two boards, V, are placed edgewise, and hinged to swing in a horizontal plane on the top of the box U. To the free ends of the said boards V boards W are hinged, which are also placed edgewise, and which extend toward the rear end of the box U. A spring-bar, M, is held in the upper edges of the side pieces of the box F by means of screws M' or other suitable devices, by means of which the said spring-bar can be pressed on the upper edges of the boards W to hold the same in the desired position.

The operation is as follows: The sand, gravel, &c., containing the gold is conducted on the screen A by the chute S a greater or less distance from the rear, accordingly as a greater or less quantity of sand or gravel is carried by the water through the chute S upon the screen A. The said chute may be moved or adjusted to have its lower end a greater or less distance over the screen. The endless chains C move in the direction of the arrow *a'*, and the scraper-blades C' carry the sand and the gravel over the screen to the chute Q. The tailings then slide down the said chute into the flume G, and are carried off by the water rushing through the said flume from the box N. The finer particles of sand, &c., will be washed by the water through the meshes or openings of the screen A upon the apron D, upon which they are carried into the transverse gutter E, and are then carried by the water into the boxes F F. The gate H of the box F is closed to prevent the water from rushing out of the said box. The heavy particles of gold, silver, sand, &c., collect on the bottom of the box F, and the lighter particles are carried upward by the current, which runs from the front part of the box F in the direction of the arrow *b'*, over the top of the box U and the upper edge of the inclined floor J into the box L, then through the cages O O' into the box N, and off through the chute G. By passing through the material in the cages O O', the water is filtered and the fine particles of gold, silver, &c., are retained in the filtering material. If a strong current is to be produced from the box F to the box L, the boards W W must be so adjusted as to form a very narrow channel between them. If a weaker current is desired, the boards W W are separated a greater distance, and thus the boards W can easily be adjusted for any desired current, as they are provided with hinges. By means of the said boards the current can be regulated as may be desired or as circumstances may require. The boards W can also be locked in position by means of the spring-bar M, which presses on the upper edges of the said boards. The depth of the current passing over the box or frame U can be regulated by the position of the said box, for, as stated, if the box U is adjusted nearer the lower end of the inclined

floor J, the stream will be deep, and if it is adjusted at the upper end the stream will be shallow. After operating for a time, a considerable quantity of sand, containing gold, &c., collects in the bottom of the box F, and the same is to be removed and washed out through the opening *a*, and is to be conducted over amalgamated plates *d*, of which a greater or less number can be arranged in front of the box. The gold, silver, and other matter are retained by the amalgamated plates as the sand flows over the same. The sand, &c., is packed so closely in the bottom of the box F that it can only be loosened with difficulty. For this reason I have provided the conduit T. After the gate H has been raised, the valve T' is opened to admit water into the rear end of the conduit, which water flows through the same, and then passes upward through the slot *t* and the apertures *s s* and loosens the sand that has accumulated in the bottom of the box F, and washes the same through the opening *a* and over the amalgamated plates. The water is admitted into the conduit T at the rear end of the box, as the water in that part of the apparatus has been filtered and is quite clear. The conduit T is provided with a series of side openings, *u u*, in the outer side, through which openings the mud and silt accumulating on the bottom of the conduit can be easily removed.

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

1. In an ore-concentrator, the combination, with a settling-box having an inclined bottom, of a wedge-shaped adjustable box or frame on the said inclined bottom, substantially as herein shown and described, and for the purpose of adjusting the depth of the stream of water that flows from the settling-box, as set forth.

2. In an ore-concentrator, the combination, with a settling-box having an inclined bottom, and openings in the lower part of the said bottom, of devices for conducting water upward through the said openings into the settling-box, substantially as herein shown and described, and for the purpose set forth.

3. In an ore-concentrator, the combination, with a settling-box having an inclined bottom, and perforations or apertures in the lower part of the said inclined bottom, of the conduit T, for conducting the water into the settling-box through the openings in the inclined bottom, substantially as herein shown and described, and for the purpose set forth.

4. In an ore-concentrator, the combination, with the settling-box F, having the inclined bottom J and slot H and apertures *s*, of the conduit T, provided at its rear end with a valve, T', and a suitable water-supply, substantially as herein shown and described, and for the purpose set forth.

5. In an ore-concentrator, the combination, with the boxes L N, of the settling-box F, having the inclined bottom J, and openings in the lower end, the gate H, and the conduit T, pro-

vided at its rear end with a gate, T'', substantially as herein shown and described, and for the purpose set forth.

5 6. In an ore-concentrator, the combination, with the settling-box having the inclined bottom J, of the box or frame U and the boards V W, placed edgewise on the top of the box U, for the purpose of regulating the current of the water flowing from the settling-box, 10 substantially as herein shown and described, and for the purpose set forth.

7. In an ore-concentrator, the combination, with the settling-box F, having an inclined bottom, J, of the box or frame U, the boards 15 V W, placed edgewise on the top of the said box and hinged to each other, the boards V being hinged at their ends to the front part of the top of the box U, substantially as herein shown and described, and for the purpose set 20 forth.

8. In an ore-concentrator, the combination, with the settling-box F, having an inclined bottom, J, of the box or frame U, the boards V W, placed edgewise on the top of the said 25 box and hinged to each other, the boards V being hinged at their ends to the front part of

the top of the box U, and devices for holding the boards W in the desired position, substantially as herein shown and described, and for the purpose set forth.

9. In an ore-concentrator, the combination, 30 with the settling-box F, having an inclined bottom, J, of the box or frame U, the boards V W, placed edgewise on the top of the said box and hinged to each other, the boards V 35 being hinged at their ends to the front part of the top of the box U, the spring-bar M, and the screws M', substantially as herein shown and described, and for the purpose set forth.

10. In an ore-concentrator, the combination, 40 with a settling-box, of the boards V W, placed edgewise and hinged to each other, and adapted to be adjusted a greater or less distance from each other for the purpose of regulating the depth of the stream of water flowing from the 45 settling-box, substantially as herein shown and described, and for the purpose set forth.

ALEXANDER D. CLARKE.

Witnesses:

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C. SEDGWICK.