

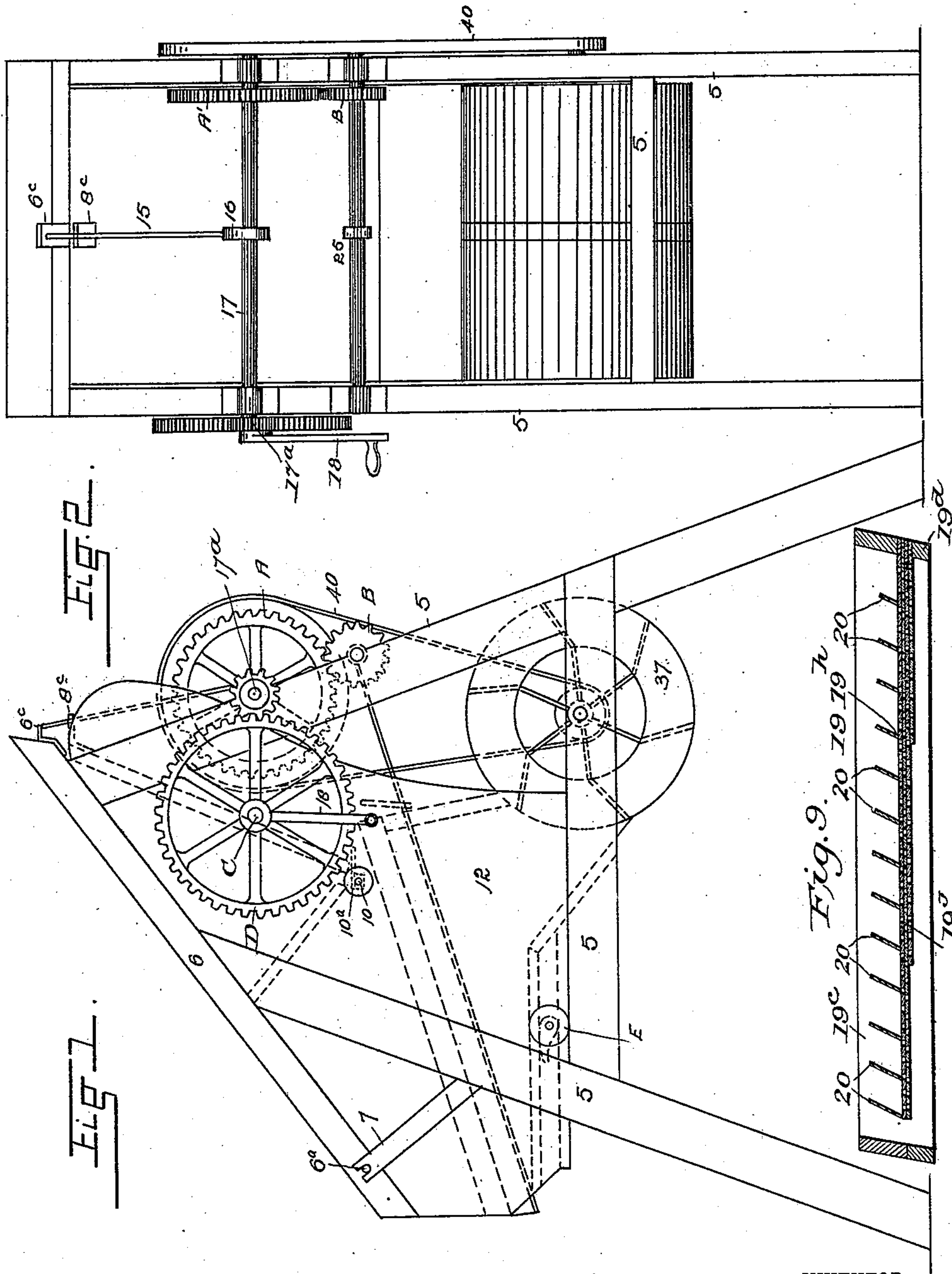
(No Model.)

2 Sheets—Sheet 1.

H. C. DOWN.
DRY CONCENTRATOR.

No. 550,219.

Patented Nov. 19, 1895.



WITNESSES:

J. J. Deane
Chas. E. Dawson

INVENTOR

H. C. DOWN.

BY

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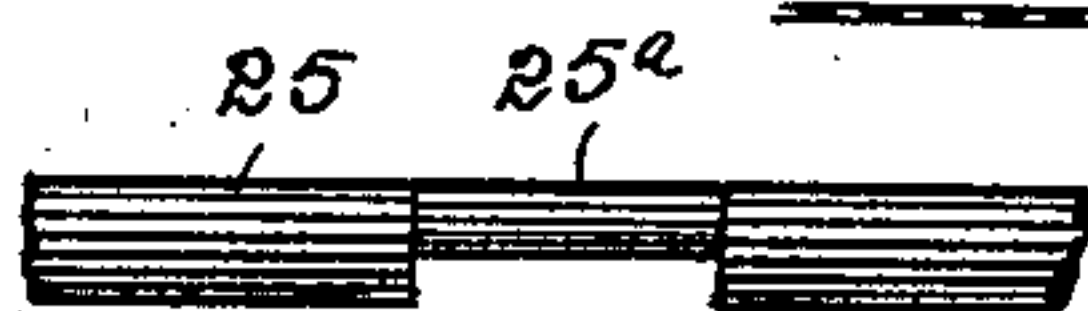
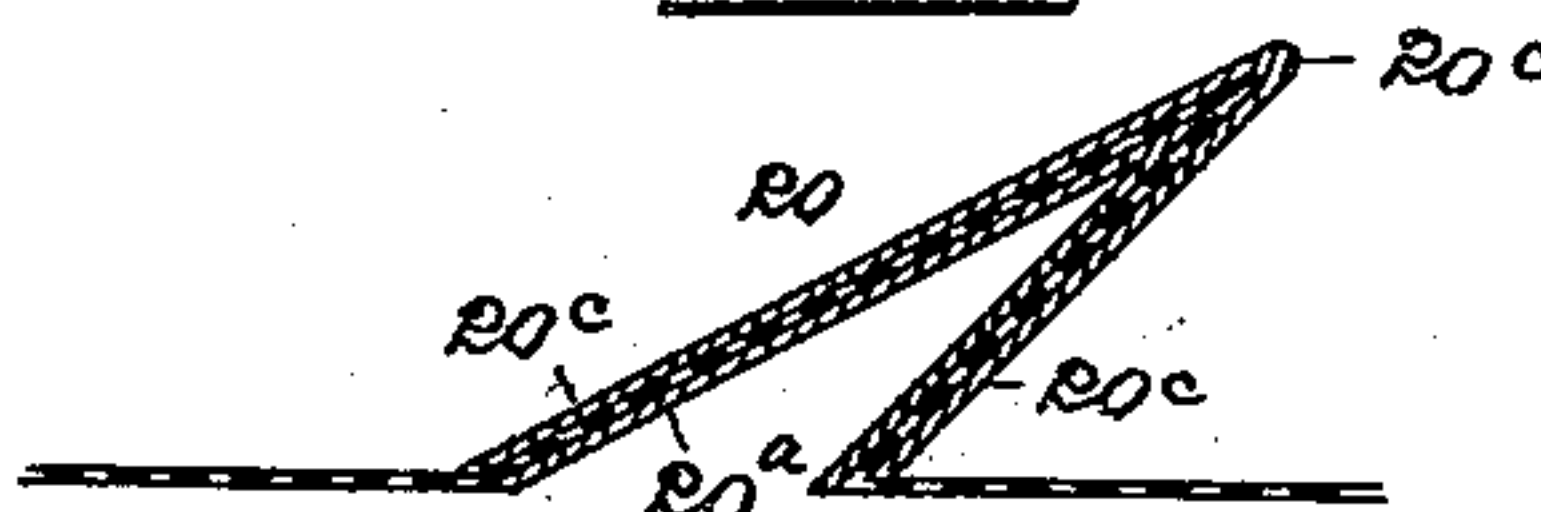
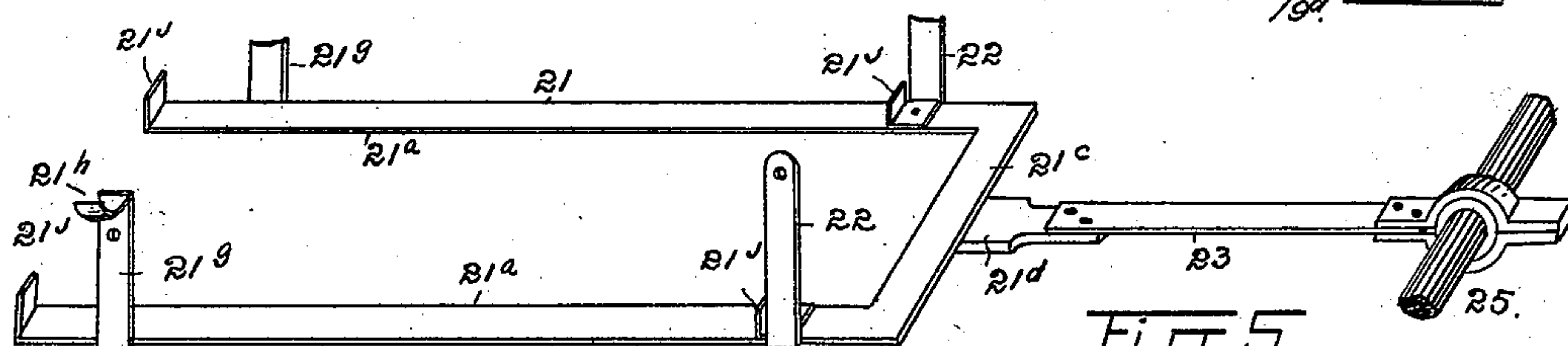
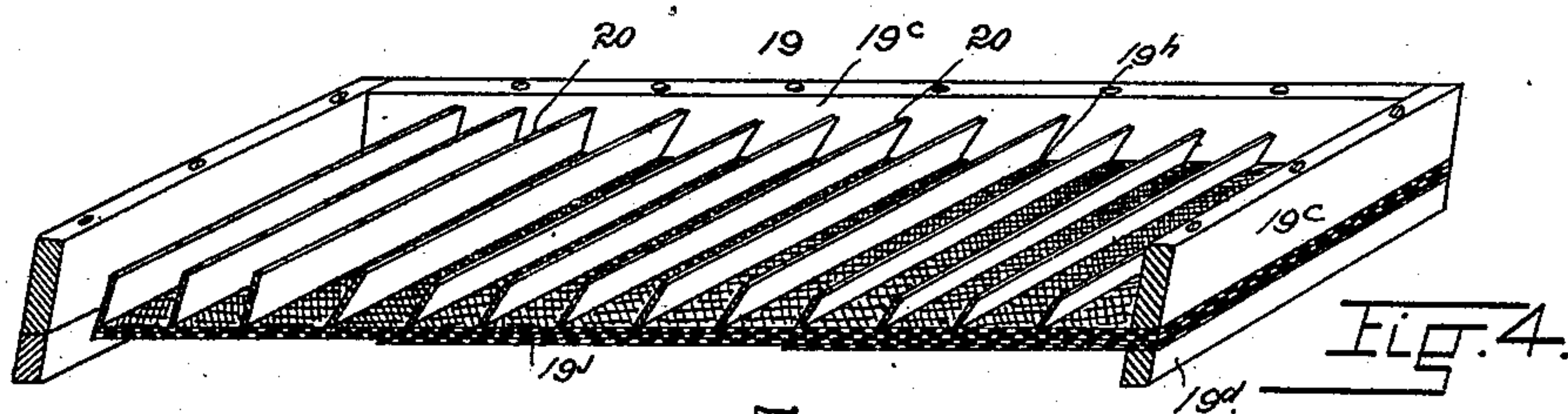
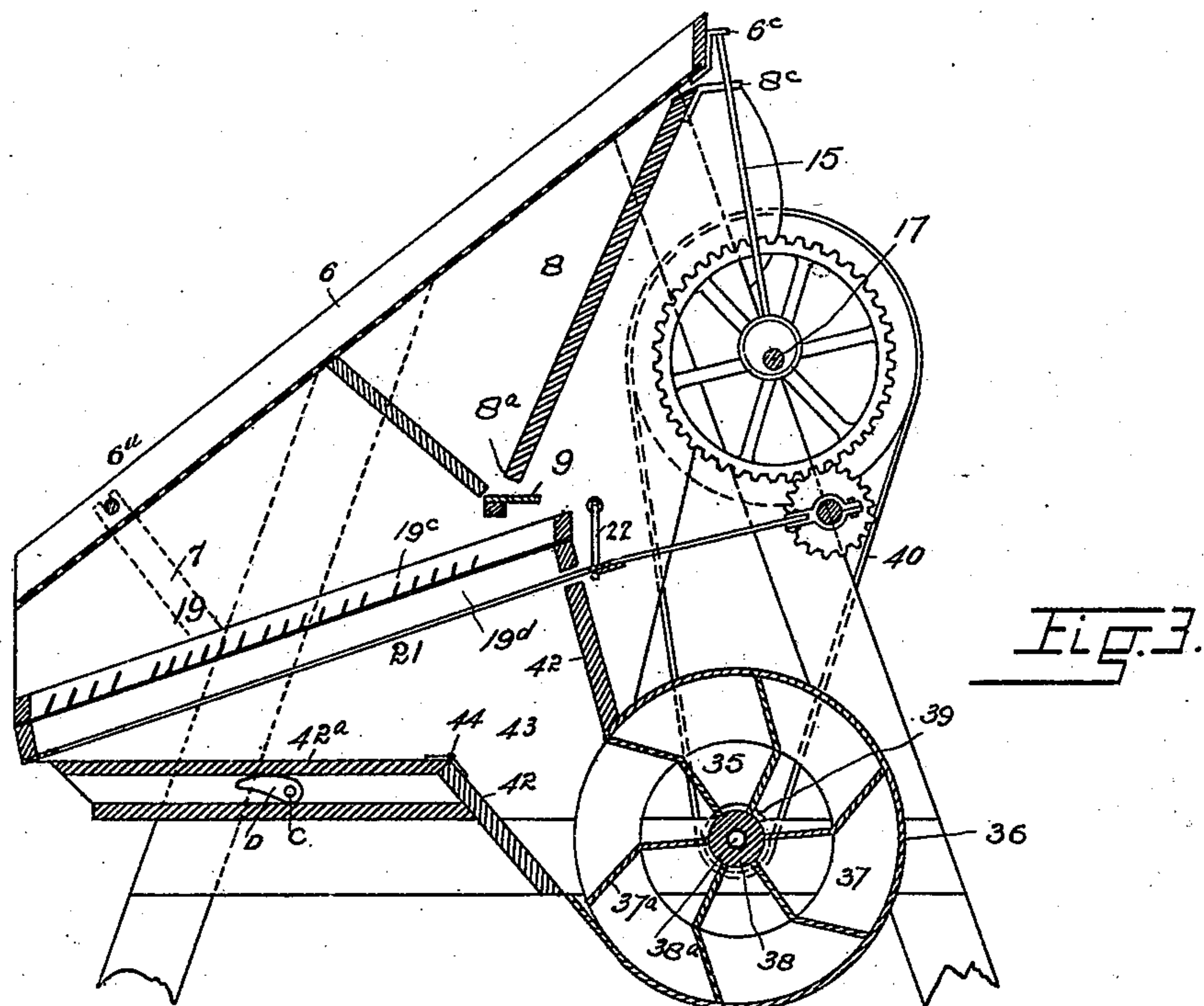
(No Model.)

2 Sheets—Sheet 2.

H. C. DOWN.
DRY CONCENTRATOR.

No. 550,219.

Patented Nov. 19, 1895.



WITNESSES:

T. J. Holland
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Ил. 8.

INVENTOR

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UNITED STATES PATENT OFFICE.

HENRY C. DOWN, OF DENVER, COLORADO.

DRY CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 550,219, dated November 19, 1895.

Application filed July 3, 1894. Serial No. 516,408. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. DOWN, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Dry Concentrators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in dry concentrators or placer-machines and has for its object the saving of the free-gold from all kinds of placer material.

The machine may be operated by hand or any other power. The power, of course, must be regulated according to the size and capacity of the machine, which consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a rear view of the same. Fig. 3 is a vertical section taken through the center of the machine. Fig. 4 is a sectional perspective view of the riffled box in which the gold is saved and will be termed the "stratifier" in this specification. Fig. 5 is a perspective view of the vibrating frame upon which the stratifier rests. This frame is shown in connection with the actuating pitman and crank-shaft. Fig. 6 is a detail view of one of the riffles of the stratifier. Fig. 7 is a perspective view in detail of the valve controlling the feed from the hopper. Fig. 8 is a fragmentary view of the crank-shaft for operating the vibrating frame. Fig. 9 illustrates the riffles of the stratifying-box, also the different thicknesses of which the bottom of the box is composed.

Similar reference-characters indicate corresponding parts or elements in the views.

Let the numeral 5 designate the framework of the machine, composed of the upwardly-extending bars and the connecting cross-bars, forming a suitable support for the mechanism.

To the front of the framework is movably attached a sand-screen 6, which is hinged on pivots 6^a, engaging sockets formed in arms 7, located near the lower extremity of the screen and made fast to the framework. The material to be treated is thrown upon this screen, which rejects the coarser portion of the gangue, while the finer sand, together with the particles of value, passes through the screen into the hopper 8, which has an opening 8^a in the bottom controlled by a valve-plate 9, made fast to a spindle 10, journaled in the sides of the casing 12, attached to the framework 5.

To one extremity of the spindle 10, and located outside of the casing 12, is made fast a hand-wheel 10^a, whereby the valve may be controlled from the outside of the casing and the feed regulated according to the condition of the material under treatment.

The material fed from the hopper passes to the stratifier 19, the bottom of which is composed of wire-cloth 19^b, say of one hundred mesh. This screen is held between the two parts 19^c and 19^d of the box. The former projects above the screen and the latter below. Both parts of the stratifying-box are preferably composed of wood. The screen bottom is held between their adjacent or meeting edges, the two parts being held together by screws inserted from the top. This box carries a series of transverse riffles 20, set into the upper part 19^c of the box and at an angle preferably of about forty-five degrees to the plane of the box. These riffles are preferably composed of sheet-metal plates 20^a, set into slots formed in the sides of the upper part 19^c of the box. These plates are double and bent to form a sharp angle at the top, their lower edges being separated. They are covered by the wire-cloth bottom, which is carried upward over the plates (see Fig. 6) and supported thereby. This screen covering is in turn provided with a sheet-metal covering or cap 20^e, which holds the wire-cloth securely in place. By this construction I obviate the necessity of connecting the wire-cloth to the riffles by means of solder, which, since it contains acid, injures the wire-cloth and renders the screen much less durable than when no acids or destructive chemicals are employed. By passing the wire-cloth up over the riffles and then applying the metal cap 20^e the connection between

the wire-cloth bottom and the riffles is made perfectly tight, preventing the escape of any mineral around the riffles.

The entire box 19 rests upon a metal frame 5 21, supported by hangers 22, pivoted at their upper extremities on the sides of the casing. This frame is composed of side rails 21^a, connected by the transverse strip 21^c, to which is attached a heavy leather tab 21^d. The actuating-pitman 23 is attached to this tab at one 10 extremity and connected with a short crank 25^a, formed on the shaft 25, at the opposite extremity. As this shaft is rotated, a reciprocal movement, composed of short strokes 15 back and forth, is communicated to the frame. The leather tab is sufficiently flexible to allow the pitman the necessary movement.

The stratifying-box rests upon the side rails 20 of the frame between the stops 21^j and is provided with short pins, which enter apertures formed in the spring-arms 21^g, attached to the side rails of the frame near their lower extremities. These spring-arms embrace the stratifier and maintain the same in place on 25 the frame. Each spring-arm is provided with a hand-piece 21^h, which may be grasped when it is desired to release the box, which is accomplished by pulling the arms outward until the pins in the box are disengaged from the 30 apertures in the arms.

In the lower part of the machine is located the blast-chamber 35, inclosed by a casing 36, and carrying suitable air-forcing mechanism. As shown in the drawings, this mechanism is 35 composed of a fan 37, having blades 37^a attached to a hub 38, mounted on a shaft 38^a. To the outer extremity of the shaft is attached a pulley 39, connected by means of a belt 40 with a pulley fast on a shaft 17, provided with a pinion 17^a. This shaft 17 carries an eccentric 16, the disk of which is made fast on the shaft, while the strap of the eccentric is connected with a pitman 15, whose upper extremity passes through an aperture formed 45 in a guide-plate 8^c, attached to the hopper and engages a plate 6^c, attached to the screen 6. The shaft 17 also carries a fast gear A, which meshes with a pinion B, fast on the shaft 25, whereby motion is imparted to said 50 shaft.

The machine is operated from an auxiliary shaft C, to which is attached a crank 18. This shaft C carries a gear D, which meshes with the pinion 17^a on the shaft 17.

55 Leading from the blast-chamber and inclosed by a casing 42 is a passage 43, through which the air-current generated in the blast-chamber passes to the under surface of the wire-cloth bottom of the stratifier 19. In addition to the wire-cloth I preferably employ 60 one or more sheets of cotton cloth 19^j, attached to the stratifier below the wire-cloth in case the blast is too strong for the material, and would otherwise have a tendency to carry the 65 the light or fine mineral over the riffles. The air-current passes through the meshes of the wire and cotton cloth and has a tendency to

raise the gangue, which is lighter than the mineral, whereby the latter is allowed to settle upon the wire-cloth in front of the riffles. 70

A part 42^a of the casing inclosing the passage 43 is hinged, as shown at 44, while its opposite extremity engages the frame 21 from below. Journaled in the casing below the 75 hinged part 42^a is a spindle C, carrying a cam D, adapted to engage the under surface of the part 42^a. This spindle projects outside of the casing and carries a hand-wheel E, whereby the cam may be adjusted and the hinged part 80 raised or lowered at pleasure. As this hinged part engages the lower extremity of the frame 21, the inclination of the stratifier is regulated by the adjustment of said part, while the air-passage 43 is kept continually closed, 85 leaving no escape for the air from the blast-chamber except through the wire-cloth bottom of the stratifier.

From the foregoing description the operation of the machine will be readily understood. By turning the shaft 17 motion is 90 communicated to the screen 6, the stratifier 19, and the blast mechanism by virtue of the construction and arrangement of parts heretofore described.

It will be observed from an inspection of 95 the drawings that the riffles 20 of the stratifying-box increase in height from the upper to the lower extremity of the box, also that the upper part of the box is provided with three thicknesses of the cotton cloth below the wire-cloth, the central portion with two thick- 100 nesses of said cloth and the lower portion with but one thickness thereof. These extra thicknesses of cloth are for the purpose of reducing the normal strength of the air-current 105 which engages the box from below, whereby the material in the upper part of the box or stratifier is subjected to less agitation from that source, that in the central portion of the box to more agitation, and that in the 110 lowest part of the box to the most agitation, my object being to sieze the particles of gold and catch the finest at the top, the medium size particles at the center, and the nuggets at the lower end. 115

Having thus described my invention, what I claim is—

1. In a concentrator, the combination with a suitable stationary frame or casing, of the vibratory frame attached to the stationary 120 frame, and the stratifying box provided with the transverse riffles increasing in height from the upper to the lower extremity of the box, the bottom of the box being composed of wire cloth and thicknesses of cotton cloth or 125 similar material, the greatest number of said thicknesses being in the highest part of the box and diminishing toward the lower end, said box being supported upon the vibratory frame and detachably connected therewith, 130 substantially as described.

2. In a concentrator, the combination of the vibratory frame composed of the side rails suitably connected, the actuating pitman and

the shaft with which the pitman is connected, and the stratifying box supported upon the vibratory frame and provided with transverse riffles increasing in height from the upper to the lower extremity of the box, the bottom of the box being composed of wire cloth and thicknesses of cotton cloth or similar material placed below the wire cloth, the greatest number of said thicknesses being in the highest part of the box and diminishing toward the lower end thereof, substantially as described.

3. The stratifying box composed of the sides which consist of two parts, the wire cloth composing the bottom of the box and held between the side parts, the transverse riffles composed of two parts, one adapted to fit over the other, the wire cloth of the box being held between the two parts of the riffles, said riffles increasing in height from the upper to the lower extremity of the box, and thicknesses of cotton cloth or similar material placed below the wire cloth, the greatest number of said thicknesses being in the highest part of the box and diminishing toward the lower end, as and for the purpose set forth.

4. In a concentrating box, the combination of the casing, the vibratory frame supported thereon, means for imparting the desired motion to said frame, the stratifying box resting upon the frame and composed of the sides, the wire cloth, and thicknesses of cotton cloth or similar material placed below the wire cloth, the greatest number of said thicknesses being in the upper part of the box and diminishing toward the lower end thereof, said box being also provided with transverse riffles in-

creasing in height from the upper to the lower extremity of the box, substantially as described.

5. In a concentrator, the combination of the casing, the movable frame hung thereon and having side rails suitably connected, means for imparting the desired motion to said frame, the stratifying box resting on the frame and provided with transverse riffles increasing in height from the upper to the lower extremity of the box, the bottom of the box being composed of wire cloth and thicknesses of cotton cloth or similar material, the greatest number of thicknesses being in the highest part of the box and diminishing toward the lower end thereof, and suitable mechanism for inducing and directing an air current to the under surface of the bottom of the box, substantially as described,

6. The stratifying box provided with transverse riffles increasing in height from the upper to the lower extremity of the box, the bottom of the box being composed of wire cloth and thicknesses of cotton cloth or similar material placed below the wire cloth, the greatest number of thicknesses being in the highest part of the box and diminishing toward the lower end, as and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

HENRY C. DOWN.

Witnesses:

G. J. ROLLANDET,
CHAS. E. DAWSON.