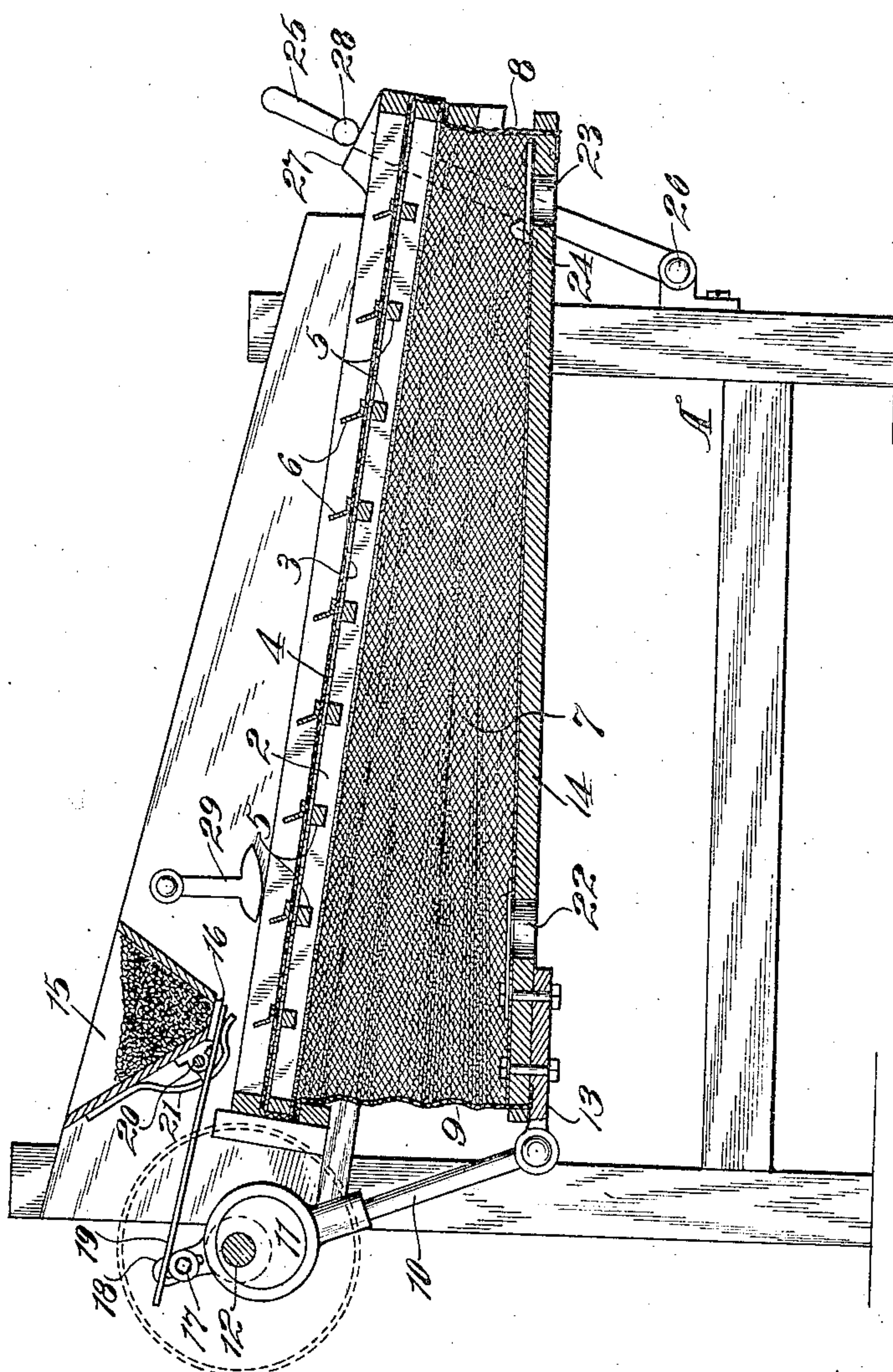


No. 879,481.

PATENTED FEB. 18, 1908.

J. MAIT.
CONCENTRATOR.
APPLICATION FILED DEC. 31, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

A. E. Maynard,
J. H. House

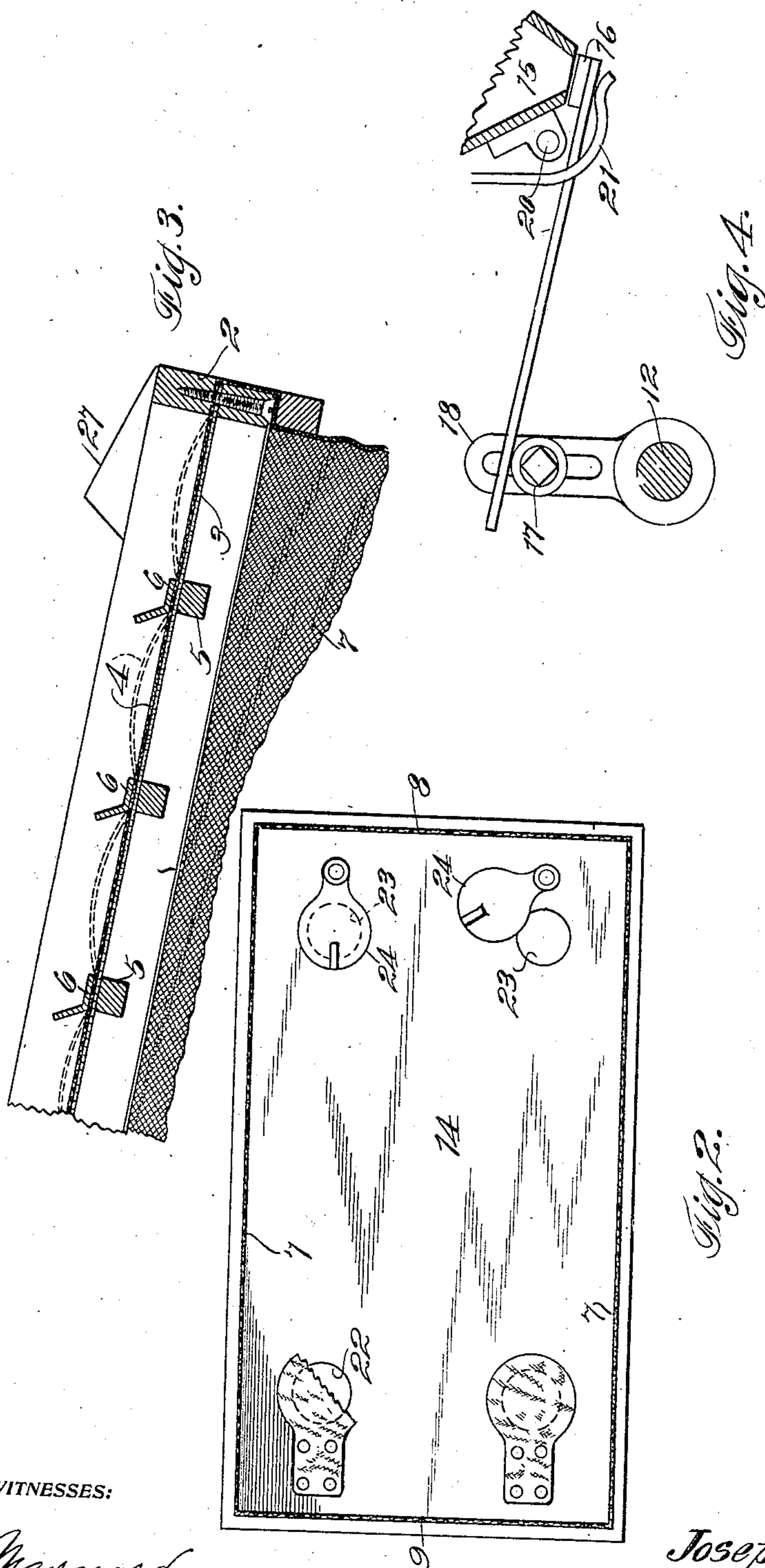
INVENTOR:
Joseph Mait;
BY
Geo. H. Strong,
ATTORNEY

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WITNESSES:

A. E. Maynard.
J. H. Hourse

INVENTOR:

Joseph Mait;
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ATTORNEY

UNITED STATES PATENT OFFICE.

JOSEPH MAIT, OF ALAMEDA, CALIFORNIA.

CONCENTRATOR.

No. 878,431.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed December 31, 1906. Serial No. 350,300.

To all whom it may concern:

Be it known that I, JOSEPH MAIT, a citizen of United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Concentrators, of which the following is a specification.

My invention relates to an apparatus which is especially designed for the separation and concentration of heavy valuable particles from lighter gangue and worthless material.

It consists in the combination of devices and mechanism which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a central longitudinal section view through the device. Fig. 2 is a plan view of the bellows bottom. Fig. 3 illustrates diagrammatically the action of the riffle-board. Fig. 4 shows the gate mechanism.

I have here shown my apparatus as consisting of a suitable frame or support A, upon which is placed an inclined frame 2 extending longitudinally of the machine. In this frame is a wire or other suitable screen 3, and upon the top of the screen is stretched a surface of canvas or equivalent woven material 4, the whole forming a riffle-board.

Transverse bars 5 support the screen and canvas at intervals, and upon the surface of the canvas, and extending across the width of this part of the device are fixed the riffles 6 which are here shown in the form of plates bent at an obtuse angle so that one flange of each plate may be fastened to one of the cross bars 5, and the other flange projects upwardly at such an angle as to be approximately vertical; the angle of the two flanges being such as will produce this result in conjunction with the incline of the riffle-board. Beneath this riffle-board is fixed a bellows 7, the lower end of which has a flexible air-tight joint, as at 8, and the upper end has the usual flexible bellows material at 9. This bellows is actuated by a rod 10 connecting with an eccentric 11 mounted upon a revoluble shaft 12; the lower end of the connecting rod 10 is pivoted to an arm 13 which is fixed to the bottom-board 14 of the bellows.

The material to be separated may be delivered from the hopper or receptacle 15 through an opening at the bottom, which is controlled by a valve or gate 16 so as to discharge upon the upper end of the riffle board.

The supply of material is regulated by means of a gate and a roller or lug 17, fixed to an arm 18 which is carried by and revoluble with the shaft 12, so that this roller or lug contacting with the arm 19 tilts this arm about its fulcrum point 20. This fulcrum point is fixed to the hopper, or other suitable support as shown, and the end of the lever carries the valve or gate 16.

A spring 21 fixed to the hopper or other suitable point, presses upon the valve-carrying end of the lever 19, and normally closes the valve 16.

Whenever the roller 17 contacts with the opposite end of the lever, the lever will be tilted, and the valve opened to allow of the escape of a portion of the contents of the hopper along the slot which is thus opened, and which extends with the hopper, the full width of the riffle-board.

If it is desired to change the feed to suit the different material, it is done by moving the roller 17 in the radial slot of the arm 18, and securing it by a locking-nut or other convenient manner. Thus the valve 16 will be opened to a greater or less extent at each revolution of the arm 18, and subsequently closed by the action of the spring 21.

The operation of the device will be as follows: The material being fed upon the screen and fibrous surface, the constant movement of the bellows will force the air against this surface, and will cause a tossing motion of the material resting upon the riffled surface. This action produces an upward movement of each section of the canvas between the transverse bars 5 to which it is secured, so that the intervals between these bars are free, and the pressure of the air causing an upward arching movement of the canvas at each impulse. This action together with the incline of the apparatus, causes a tossing of the material which carries the lighter material to the surface, and eventually tosses it over each of the riffles as it reaches them, while the heavier material will settle down behind the riffles and there be retained. Air is admitted into the bellows through the bottom-board 14, through a flat valved aperture 22. This aperture is near the upper end of the bellows which has the greatest amount of movement, thus insuring a full supply of air at each stroke of the bellows. In order to regulate the amount of air which passes through the fibrous surface, I have shown openings 23 near the lower end of the bellows,

these openings having turnable valves or gates 24. These valves or gates may be moved so as to expose more or less of the openings 23, and thus the amount of air escaping through these openings will serve to maintain the balance within the bellows without retaining so large a quantity within the bellows as would otherwise occur. That is to say, the quantity of air admitted through the valves 22 will be substantially constant, but as the bellows close a portion of this air will be discharged through the openings 23, and the amount delivered against and through the woven or canvas surface will be correspondingly diminished. Thus light material carrying very light flake gold, or dust, may be separated without so violent an action as would tend to discharge all of the dust as well as the gangue, and by closing the ports 23 more or less the proportion of air delivered to the riffled surface will be increased to suit the character of the material which is being worked. When the riffles have been sufficiently charged with material, the riffle-board may be withdrawn, sliding outwardly at the lower end when released. It is normally locked in position by means of a lever 25 which is fulcrumed to the frame as shown at 26. A beveled or wedge-shaped block or projection 27 is carried upon the side or sides of the riffle-board, and the lever 25 has lugs or suitable attachments as 28, which will bind and lock upon the blocks 27 so as to maintain the riffle-board in its position while operating. By withdrawing this locking device the riffle-board may be easily removed, its contents emptied and the board returned to place again.

29 is a swinging latch, of which there may be one upon each side of the main frame, and these latches may be turned down to bind upon the upper edges of the riffle-boxes, and thus retain them in place against the upward impulses of the bellows.

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

1. In a concentrating and like apparatus, the combination of a bellows hinged at one end, having inlet and regulating openings in the bottom board, means by which said bottom board is reciprocated, a riffle-board including a wire-supporting screen and a pervious woven fabric loosely fixed upon the surface of the screen, riffles extending transversely across said surface at intervals and means including swinging members pivotally secured to a fixed part of the apparatus and having free ends to engage the riffle board, by which the riffle-board is removably locked upon the top of the bellows.

2. In a concentrator and the like, the combination of a bellows having a hinged bottom board with a valved inlet opening near the movable end, a riffle-board having

a tight joint, with the upper side of the bellows, fixed transverse bars at intervals across said board, a wire screen surface supported upon said bars, a canvas or other equivalent permeable fabric loosely fixed upon the top of the screen, riffle bars in the form of obtuse angle plates fixed upon the transverse bars of the riffle board so as to incline backwardly, a source of supply from which material may be delivered upon the upper end of the canvas surface, a tilting spring-pressed gate by which the discharge from such source is controlled, a crank or eccentric on said shaft having connection with the free end of the bellows to reciprocate it, a second crank or arm on said shaft, and a revoluble pin adjustably mounted on said second crank or arm and movable in unison with the crank, a lever connecting with the gate and intermittently actuated by the pin.

3. In a concentrating and like device, the combination of a bellows hinged at one end, a riffle-board or support with a screen and a canvas surface superposed thereon, said canvas being loosely fixed transversely at intervals so that air forced against and through it will cause the intermediate portions of the surface to curve upwardly at each impulse, a valved opening through which air is admitted to the bellows, an eccentric or crank connected with the bottom board of the bellows, an arm fixed to the eccentric shaft, a lug or roller radially adjustable upon said arm, a source of supply from which material to be concentrated may be delivered upon the upper end of the canvas surface, a spring-pressed hinged valve whereby the source of supply is controlled, a lever arm extending from said valve and in line with the circle of revolution of the adjustable lug whereby the degree of opening of the valve is regulated.

4. In a concentrator and the like, the combination of an inclined screen and a loose superposed canvas surface having backwardly inclined riffles fixed transversely at intervals, said canvas having free flexible sections between the riffles, a bellows the upper part of which forms a tight joint with the riffle-board, a hinge by which one end of the bottom board of the bellows is connected, swinging clamping members pivotally connected to a fixed part of the apparatus and having their free ends adapted to bear downwardly on the screen frame to clamp it to the top of the bellows, a reciprocating mechanism connected with the free end of said bottom board whereby said board is reciprocated, said bellows having an air inlet and an adjustable air outlet whereby the pressure of air through the canvas is regulated.

5. In a concentrator and like apparatus, the combination of a bellows having a hinged movable bottom board with a valved inlet and an adjustable discharge opening, an inclined riffle board forming a tight joint with

the upper part of the bellows and removable with relation thereto, means for locking said board in position, said means including a wedge-shaped block carried by the riffle-
5 board, a fulcrumed lever adapted to interlock with said block and a pivoted swinging link adapted to engage with the upper edge of the riffle board to lock it in place.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH MAIT.

Witnesses:

S. H. NOURSE,
FREDERICK E. MAYNARD.