

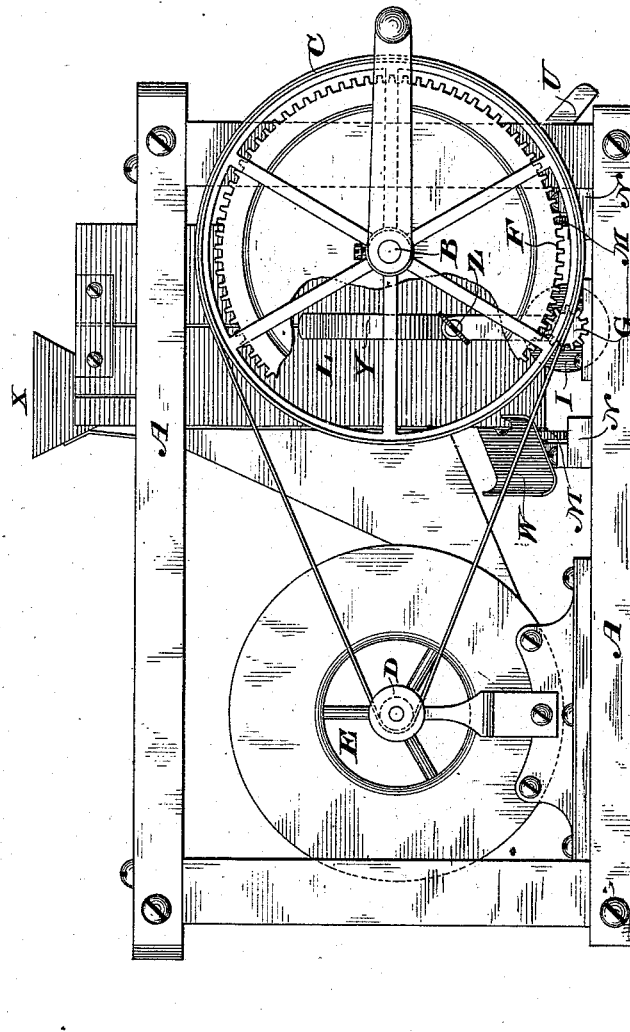
P. PLANT.  
Ore-Separator.

4 Sheets—Sheet 1.

No. 215,290.

Patented May 13, 1879.

Fig 1.



WITNESSES

*Wm A Shinkle*  
*Geo W Brock*

INVENTOR

*Paschal Plant*

By his Attorneys

*Baldwin, Hopkins, & Peyton*

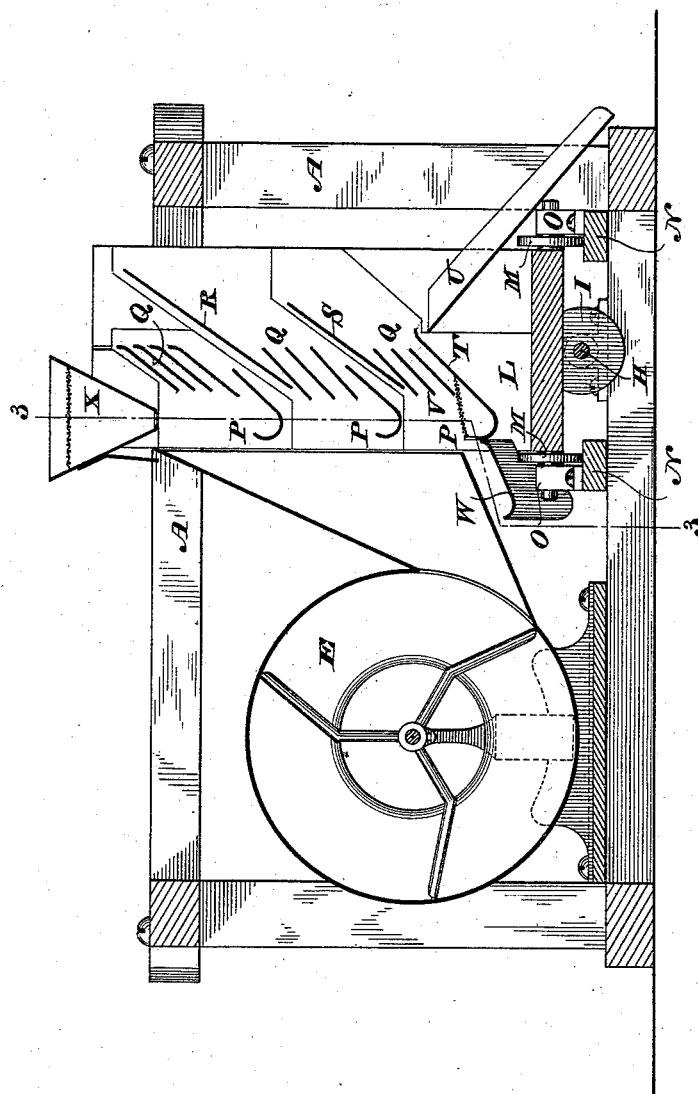
P. PLANT.  
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Fig 2



WITNESSES

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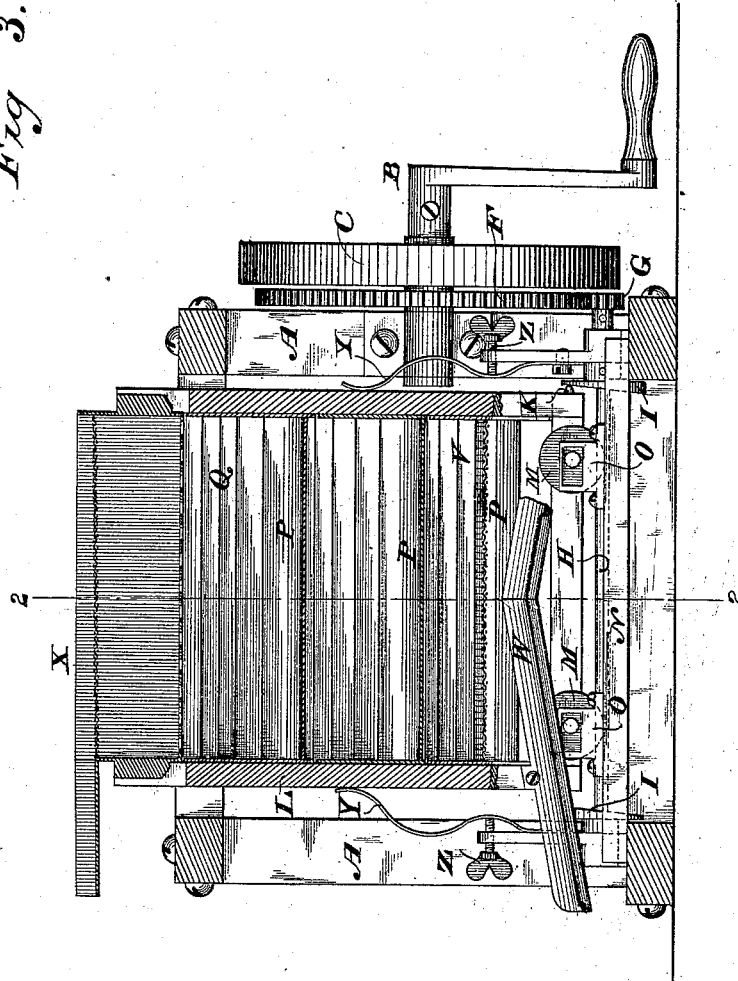
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Fig 3.



WITNESSES

*Wm A Skinkle*  
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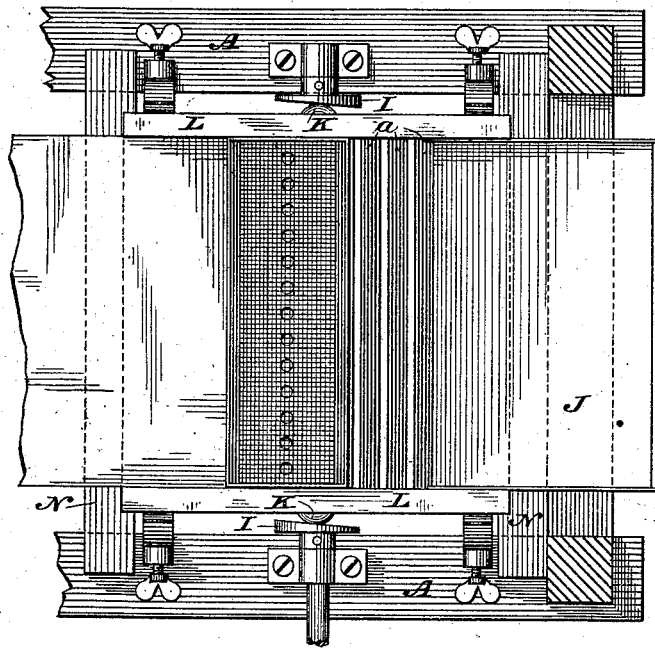
P. PLANT.  
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4 Sheets—Sheet 4.

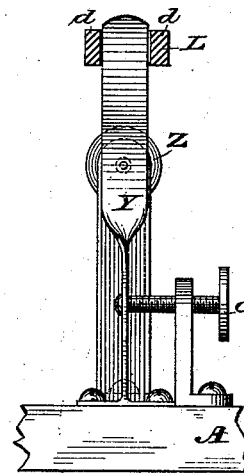
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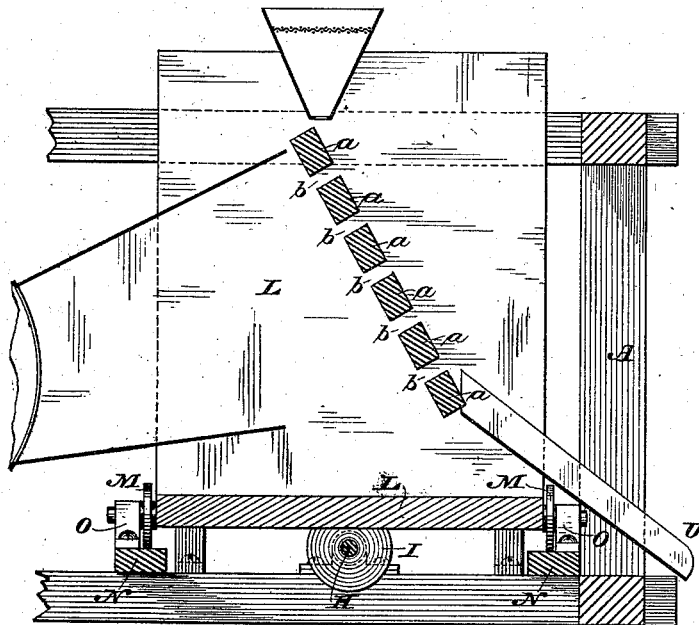
*Fig 4.*



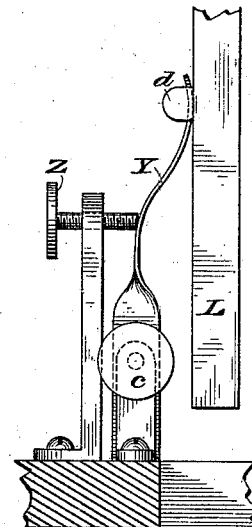
*Fig 6.*



*Fig 5.*



*Fig 7.*



WITNESSES

*Wm A Skinkle*  
*Geo W Buck.*

INVENTOR

*Paschal Plant.*

By his Attorneys

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# UNITED STATES PATENT OFFICE.

PASCHAL PLANT, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. **215,290**, dated May 13, 1879; application filed February 3, 1879.

### *To all whom it may concern:*

Be it known that I, PASCHAL PLANT, of Washington, in the District of Columbia, have invented a new and useful Apparatus for Dry-Separating Precious Metals from their Ores, of which the following is a specification.

In this apparatus I employ a blower, substantially such as has been heretofore employed in separating gold from its ores, to drive a current of air against the ore as it falls from the feed-hopper and descends from one separator to another. This current of air will drive off the floating gold that exists in an almost impalpable powder of exceedingly fine particles, as well as the finer particles of earthy matter or dust, and hence this apparatus is only adapted to separate particles of precious metals that have a cubic or are of appreciable weight. In this respect it is unlike apparatus heretofore invented by me for separating floating gold, in which very shallow separators and a very nice tremulous agitation without a blast of air are essential. The very fine or floating gold and the fine particles of earthy matter being blown away, only the heavy particles of earthy matter and precious metal are left to enter the separators, where they are agitated for separation, and where the precious metals, by their greater specific gravity, will readily find their way to the bottom, and the earthy matter will be delivered over and conveyed away. Thus it will be observed it is my object merely to facilitate the dry-separating of such gold as is usually separated by the use of water.

My invention consists in the combination, with a fan-blower, of a series of separators having inclined plates and partition-plates, and in a frame combined with peculiar adjustable springs for regulating the impulses of vibration.

In the accompanying drawings illustrating my invention as embodied in my apparatus, Figure 1 is a side elevation with portions of the gear-wheel broken away, to show more clearly the parts lying beneath them. Fig. 2 is a vertical longitudinal section on the line 2 2 of Fig. 3. Fig. 3 is a vertical transverse section on the line 3 3 of Fig. 2. Figs. 4 and 5 represent a modified form of separator on the same

principle, and Figs. 6 and 7 a modified form of spring-agitator regulator.

A indicates the main frame; B, the main driving-shaft, having its bearings supported on the main frame; and C, the main driving-wheel for the blower, from which a belt extends to the blower-pulley D, driving the blower E, which is of ordinary construction and need not be further described. F is the main driving-wheel for the agitating mechanism, which gears with the pinion G on the cam-shaft H, provided at its opposite ends with incline-sided circular cams I. The inner inclined faces of these cams bear against friction-wheels K on the lower part of the agitator-frame L, which latter is supported on friction-rollers M, resting on cross-beams N, and having the outer ends of their axles in slotted guideways or bearings O.

From the foregoing and from the drawings, it will be understood that when motion is imparted to the main driving-shaft and driving-wheels, the blower will be operated to drive a current of air toward the agitator-frame, which will be rapidly reciprocated, with the parts it bears, by means of the revolving cams.

I have illustrated within the agitator-frame three distinct ore receptacles or separators, P; but it is obvious that a greater number might be employed. These separators are supported in grooves in the inner faces of the sides of the agitator-frame, one directly over the other; and each separator has above it, and partly behind it, a series of inclined plates, the inner edges of which project over the edges of their respective separators, so as to deliver within the separators, while their outer edges project without the separators, so as to deliver outside of them. Besides these inclined plates there are inclined partition-plates R and S, which serve to convey the heavier portions of the ore blown over from the first separator to the second separator, and from the second to the third, while they direct the lighter portions over and out of the apparatus as waste. The outside or exterior edge or flange, T, of the lowest separator projects over the upper edge of an inclined delivery or waste plate, U, so as to deliver the earthy matter blown over thereon.

In front of the lowest separator, which may be provided with a sieve, V, as shown, is a double-inclined spout or conveyer-plate, W, which is secured to the agitator-frame, and which conveys the waste earthy matters out on opposite sides of the machine. The hopper X is supported on the top of the agitator-frame, and is provided with a suitable inclined sieve and spout, for the purpose of conveying away lumps of earthy matter too large for treatment. Its bottom is also perforated underneath the sieve; but I allege nothing novel about the hopper.

From this description of the construction and arrangement of the separating mechanism, it will be understood that as the ore drops from the hopper it will come immediately in contact with the blast of air from the blower in its descent to the first separator. This blast will take up its lighter particles, and carry them out through the first series of inclined plates Q, and only the heavier particles which are able by their gravity to immediately resist the blast of air will reach the first separator for agitation there.

Whatever particles are not sufficiently light to be carried away from the machine entirely will fall behind the upper series of plates Q, upon the partition-plate R, and thence into the second separator.

With respect to this second separator, the operation will be similar, all of the particles blown over that are too heavy to pass entirely away being conveyed by the plate S into the third separator, with respect to which a similar operation will take place, except that whatever ore is blown away from this separator will fall upon the waste-plate U, and be conveyed away.

The heavier earthy matters not affected by the blast will be delivered over in front of the respective separators as they become filled, and will fall upon the double-inclined plate W.

In order to preserve the equal distribution of the ore in the separators at a common depth, I provide on each side of the agitator-frame adjusting-springs Y, secured to brackets on the main frame, and controlled by set-screws Z, through which I can effect or regulate the impulses of vibration. Thus, by turning the one set-screw so as to cause a greater pressure of the spring against the agitator-frame on that side, and by turning the set-screw on the other side so as to cause a diminished pressure of the spring on the agitator-frame on that other side, the impulses of vibration will be so affected as to correct any tendency of the ore to drift in one direction and bank up in the separators.

By reversing this adjustment and spring-pressure I can correct any tendency of the ore to drift in the opposite direction in the sepa-

rators, and an operator of the machine soon becomes skilled by experience, so that by these instrumentalities he can readily keep the ore level under vigorous agitation.

In Figs. 4 and 5 I have shown an arrangement of inclined plates or bars *a*, intended to be placed in the path of the ore descending from the hopper to the separators. The heavier particles of ore will pass through the openings *b* between these plates *a*, and the lighter particles will be blown away. I have not illustrated separators in connection with these figures, because their relative positions and mode of operation will be understood from what has preceded.

In Figs. 6 and 7 I have illustrated a spring twisted in the center, so that its parts stand at right angles, and provided with two set-screws—one, Z, like that already described, to increase or decrease the pressure of the spring directly against the side of the agitator-frame, and the other, *c*, to adjust the pressure of the spring at right angles to the direction of pressure of the first set-screw. The spring is placed between lugs *d*, projecting from the side of the frame.

The object of this construction of spring and application of set-screws to it is, that the spring, by means of the set-screw *c*, may tend to press against the lugs of the agitator-frame in either direction at right angles to the direction of the reciprocations of the agitator-frame. The result will be that it will correct any tendency of the agitator-frame to twist, as it were, or deviate from a right line in its reciprocations.

In Fig. 4 I have shown in plan four of these springs applied to the four corners of the agitator-frame, whereby a most delicate and perfect adjustment, and consequent regulation of the impulses of vibration for agitation, can be secured.

The screw *c* should be fastened to or into the spring, so as to be capable of forcing it in both directions.

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

1. The combination of the blower, the series of separators having inclined plates, and the partition-plates R and S, substantially as described.

2. The combination of the agitator-frame, the main frame, and the springs, each provided with two adjusting-screws, working at right angles to each other, as and for the purposes set forth.

In testimony whereof I have hereunto subscribed my name.

PASCHAL PLANT.

Witnesses:

WM. J. PEYTON,  
CHAS. E. UPPERMAN.