

No. 630,926.

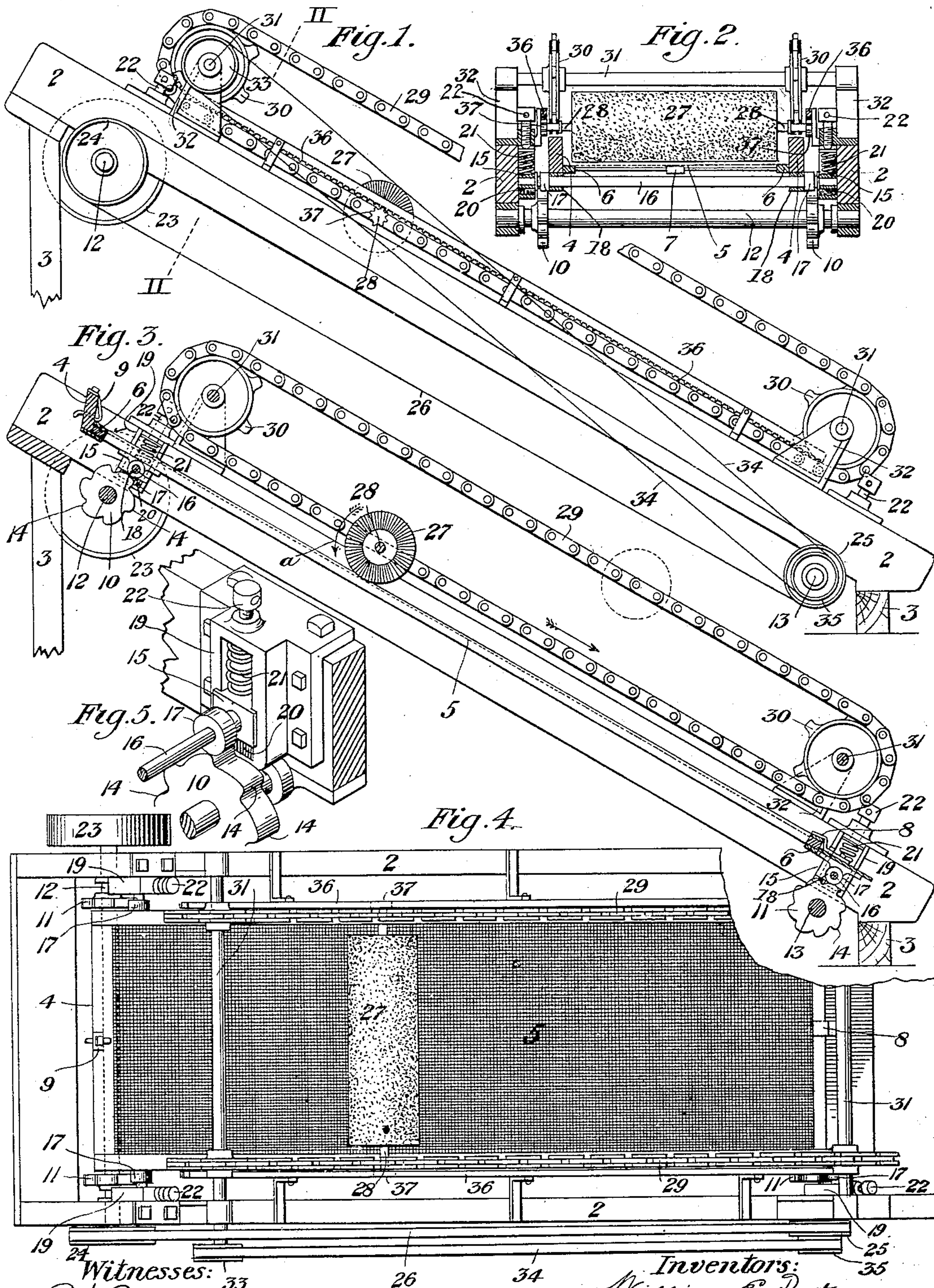
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W. E. PORTER & W. R. McKELVY.

MINERAL SEPARATOR.

(Application filed Mar. 5, 1898.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

WILLIAM E. PORTER AND WILBUR R. MCKELVY, OF SHOUSETOWN, PENNSYLVANIA, ASSIGNORS OF PART TO T. C. O'DONOVAN AND E. E. LAUGHNER, OF SAME PLACE.

## MINERAL-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 630,926, dated August 15, 1899.

Application filed March 5, 1898. Serial No. 672,707. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM E. PORTER and WILBUR R. MCKELVY, citizens of the United States, residing at Shousetown, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful Improvement in Mineral-Separators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in side elevation, partly broken away. Fig. 2 is a cross-section taken on the line II II of Fig. 1. Fig. 3 is a central longitudinal section. Fig. 4 is a plan view, partly broken away. Fig. 5 is a perspective detail view showing the oscillating shaft mounted in the cushion-housing in engagement with the actuating-wheel.

Our invention relates to separating-screens for the purpose of screening minerals; and it consists in the certain novel construction and arrangement whereby the motion of the screen is controlled, with apparatus for cleaning the screen and other features of improvement, which we shall now proceed to describe.

Referring to the drawings, 2 2 represent the side members of the stationary supporting-framework, laid at an angle suitable to facilitate the travel of the material by gravity and supported on suitable timbers 3. The screen-frame 4 is mounted within the sides of such framework, its sides and bottom 5 coinciding with the general direction of the framework, and the bottom is composed of perforated plate, woven wire, or other suitable material, as may be desired, preferably stretched upon a frame or shoe 6, rectangular in form and adapted to fit within the sides of the framework 4. The frame 6 may be stiffened by lateral braces connecting its opposite sides and provided with a turnbuckle 7 for adjustment, as shown in Fig. 2, and it is designed that this frame 6 shall be removed from the frame for the purpose of renewal of the screen-cloth. To facilitate such removal and replacement, a brace 8 extends up over the bottom and holds the frame in position, the top being provided with a spring-latch 9, adapted to bear upon the upper end of the screen-bottom

frame when in position and to be withdrawn for removal.

The entire screen-frame is designed to rest upon the actuating cam-wheels 10 11, mounted on shafts 12 13, disposed across the main frame at either end, which wheels are provided with a plurality of cam knobs or faces 14. To the under side of the screen-frame are secured in boxes 18 the cross-shafts 16, upon which are journaled the small rollers 17, adapted to bear upon the wheels 10 11 at each side and end of the machine, as shown, while the projecting ends of shafts 16 are journaled in boxes 15, mounted in vertical housings 19, secured to the main sides of the framework 2. Within these housings and beneath the boxes 15 are sections of resilient material 20, such as rubber, or metallic springs may be used, while above, resting on the top of the boxes, are springs 21, the pressure of which may be controlled by temper-screws 22. In this manner the wheels 17 are held in such a position that at each revolution of wheels 10 and 11 the knobs 14 strike wheels 17 and slightly raise them and the screen-frame, the springs causing a rebound and reducing and absorbing the shock of impact. Either one of the cam-wheel shafts 12 or 13 may be provided with a driving-pulley 23, and on the other side the shafts are fitted with pulleys 24 25, geared together by belting 26.

We have found by experiment that the best results may be secured by agitating the screen at either end separately and at different speeds, as such action results in an irregular intermittent motion, which gives a very thorough screening and separating action, and for this purpose we have made the upper and lower pairs of wheels 10 and 11 with different numbers of cam-faces. With such an arrangement the shafts 12 and 13 may be driven at the same speed, and the cam-wheels having the greater number of faces 14 will be brought into contact with the wheel 17 a greater number of times than the wheels having the less number, thereby actuating the ends of the screen at different speeds. This action will be readily understood by reference to the drawings, as it will be seen that upon rotation of shafts 12 and 13 the wheels



17 will be thrown upwardly by each successively contacting face 14 and thrown down thereupon by the pressure of spring 20, the under cushion 19 acting to absorb the impact, 5 as has been said. Variable motion may also be imparted to the screen by making the wheels 10 and 11 with an equal number of faces 14 and driving them at varying speeds by using pulleys of different diameters. In 10 the drawings we have shown the application of both principles, although it will be understood that either may be used with good results, or both, as we have shown, and we desire to include either construction as within 15 the scope of our invention.

For the purpose of cleansing the screen and dislodging adhering particles we employ a revolving traveling brush 27, which is cylindrical in form, mounted on a shaft 28. It is 20 designed that this brush shall traverse the length of the screen from the top downwardly and at the same time be made to revolve in the direction shown by the arrow *a*, and for this purpose the ends of the shafts are revolv- 25 ibly supported in sprocket-chains 29 at each side of the machine, mounted on upper and lower sprocket-wheels 30 on cross-shafts 31, resting in brackets 32, secured to the stationary frame. One of the shafts 30, preferably the upper, is provided with a pulley 33 30 and geared by belt 34 to a driving-pulley 35 on shaft 13, by which means the sprocket wheels and chains are actuated and the brush carried around, traversing the length of the screen-bottom in contact in its downward 35 travel and being carried in suspension by the chain upwardly on return, as indicated in dotted lines in Fig. 3.

For the purpose of imparting a rotary motion to the brush a stationary rack 36 is 40 mounted rigidly at each side upon brackets secured to the main framework, the teeth of the rack projecting downwardly, while on

the extremities of the brush-shaft 28 are toothed pinion-wheels 37, which engage the 45 teeth of the rack, and thus cause rotation of the brush in the proper direction throughout its travel, the rotation ceasing at the terminus of the rack when the brush is carried 50 around the lower sprocket-wheel and on its upward travel.

It will be understood that the screen-frame may be provided with proper chutes for distribution of the material, and these may be 55 arranged to suit the requirements and conditions to which the machine is to be adapted. Such additions are contemplated, and all changes or variations which will suggest themselves to the skilled mechanic are to be considered as within the scope of our inven- 60 tion.

What we claim is—

1. A mineral-separator comprising a supporting-framework set at an angle, cross-shafts mounted therein, cams secured on said 65 shafts, a screen mounted on cross-shafts having sliding bearings in the frame provided with elastic cushions, and rollers on the cross-shafts adapted to be engaged by the cams, substantially as set forth. 70

2. A mineral-separator comprising a supporting-framework set at an angle, cross-shafts mounted therein driven at different 75 speeds, cams secured on said shafts, a screen mounted on cross-shafts having sliding bearings in the frame provided with elastic cushions, and rollers on the cross-shafts adapted to be engaged by the cams, substantially as set forth.

In testimony whereof we have hereunto set 80 our hands.

WILLIAM E. PORTER.  
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Witnesses:

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