

(No Model.)

3 Sheets—Sheet 1.

J. TALLEY.  
ORE SEPARATOR.

No. 388,464.

Patented Aug. 28, 1888.

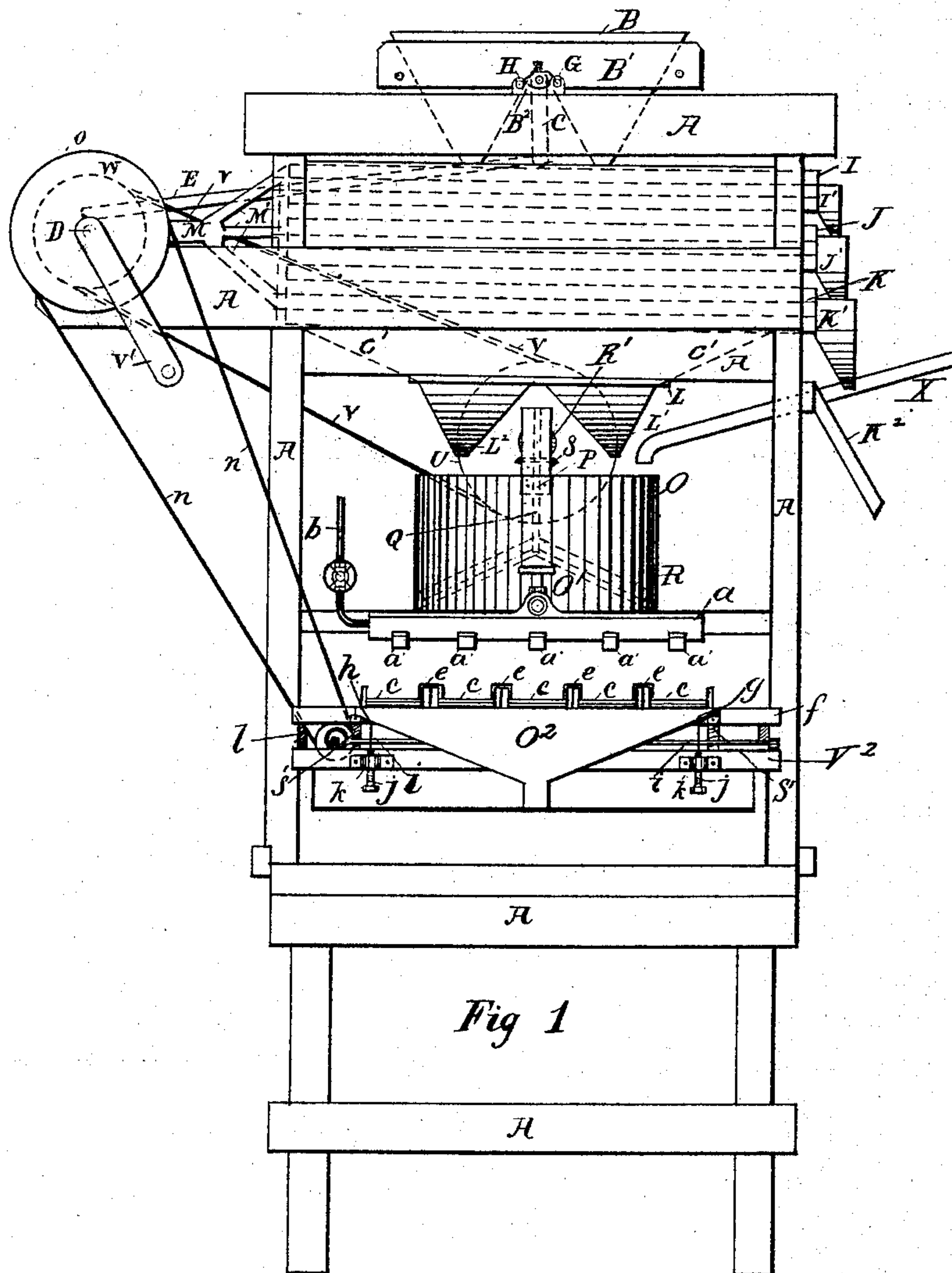


Fig 1

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INVENTOR.

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BY R. M. McDermott.  
his  
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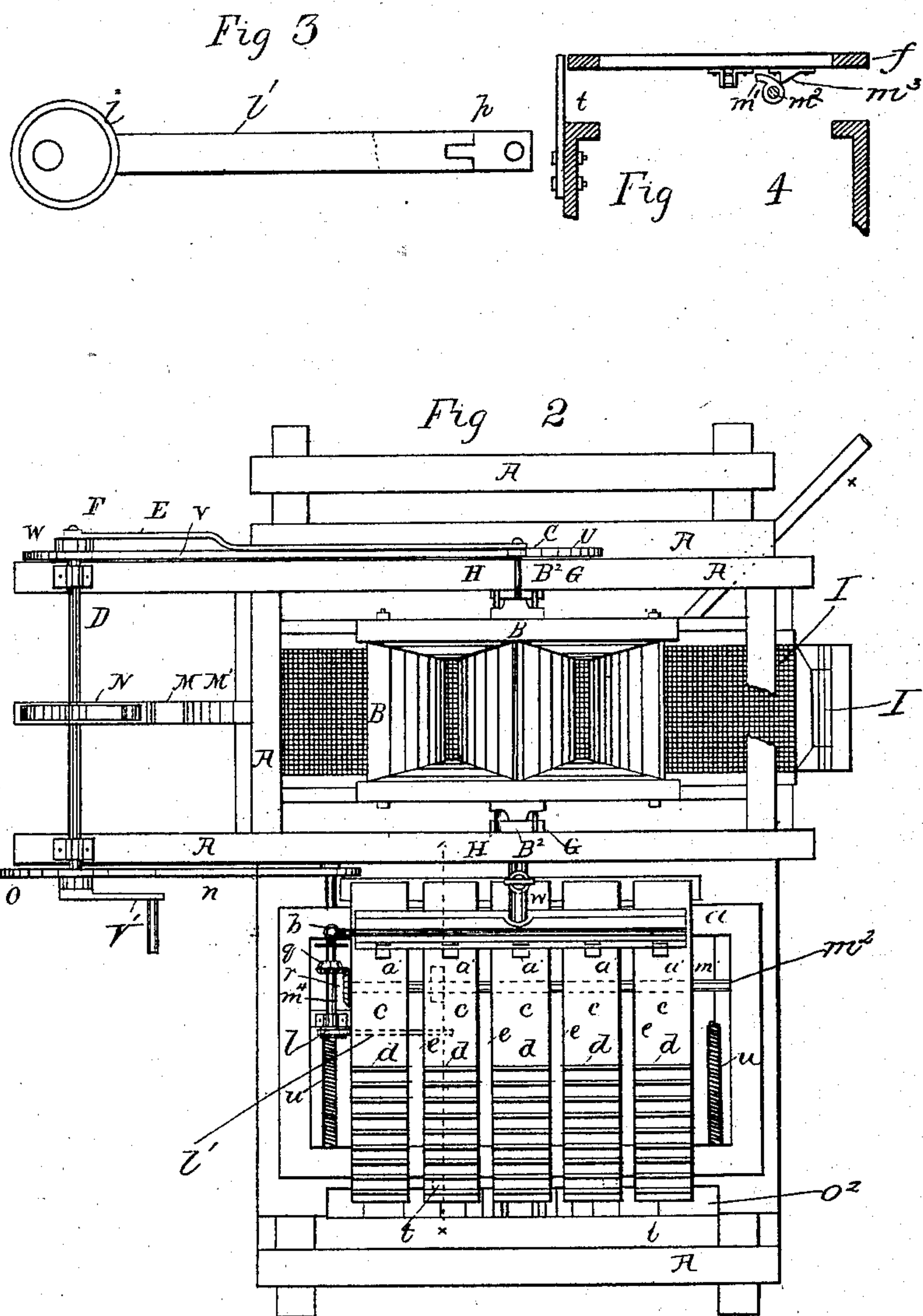
(No Model.)

3 Sheets—Sheet 2.

J. TALLEY.  
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Patented Aug. 28, 1888.



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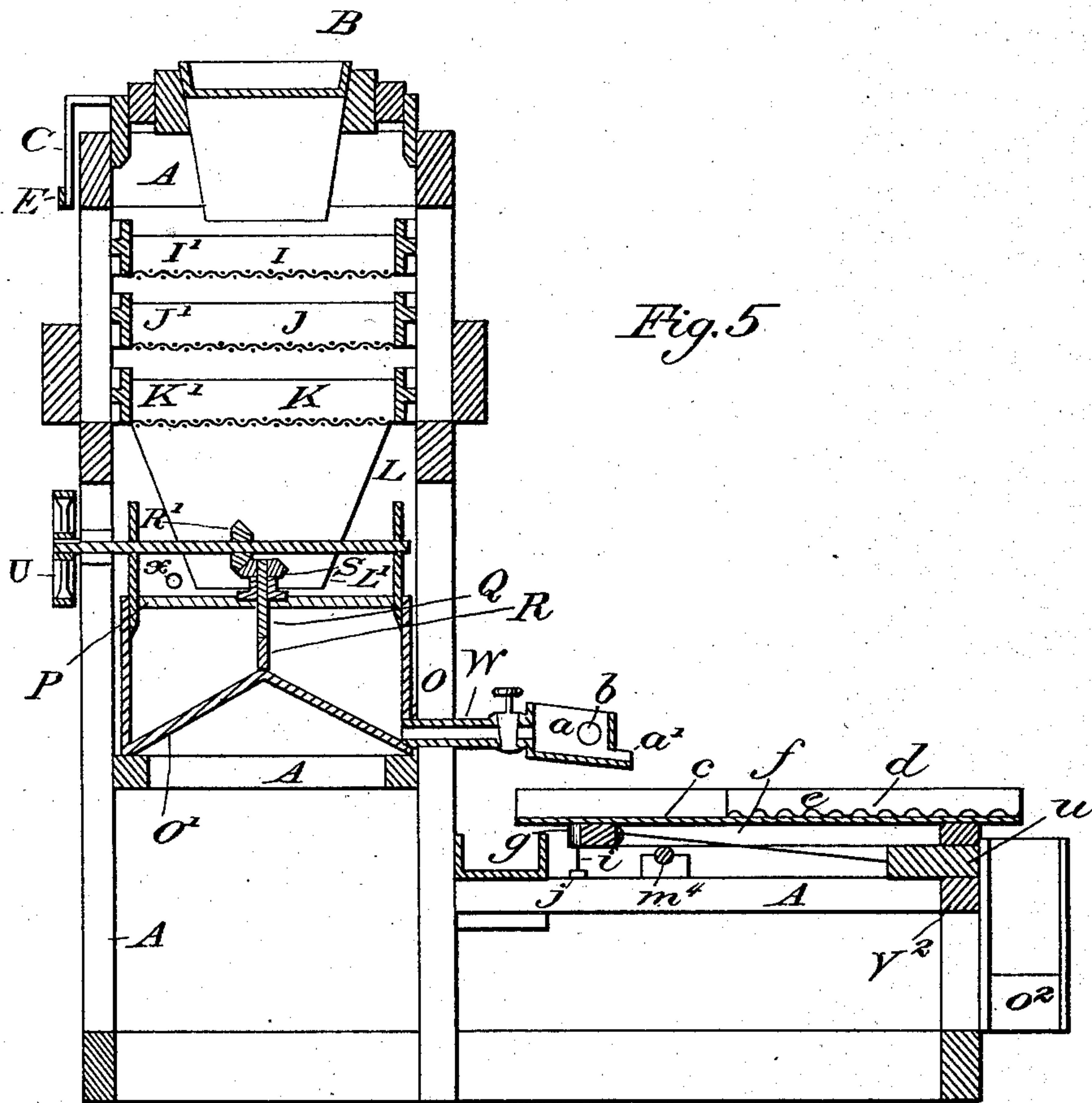
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3 Sheets—Sheet 3.

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No. 388,464.

Patented Aug. 28, 1888.



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Inventor:

James Talley.

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R. M. McDermott  
his Atty.



# UNITED STATES PATENT OFFICE.

JAMES TALLEY, OF DENVER, COLORADO, ASSIGNOR TO SARAH E. TALLEY,  
OF SAME PLACE.

## ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 388,464, dated August 28, 1888.

Application filed May 23, 1887. Serial No. 239,144. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES TALLEY, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have  
5 invented certain new and useful Improvements in Ore-Separators; 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  
10 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 ore-concentrators.

15 The objects of my invention are, first, to provide a simple, durable, and inexpensive concentrator for crushed mineral ores which will accomplish a separation of the same from the rock in which they are carried; second, to  
20 provide a concentrator which will concentrate the valuable particles contained in auriferous and argentiferous sands and separate them from the silicious matter, and to provide a concentrator which will work ores crushed to various sizes. I attain these objects by the mechanism illustrated in the accompanying drawings, of which—

Figure 1 is a side view of the entire machine. Fig. 2 is a top view of the same. Fig.  
30 3 is a side view of the eccentric-wheel and its connections which operate the screens. Fig. 4 is a sectional view of the pan-table on the line *xx*, Fig. 2. Fig. 5 is a longitudinal central section of the machine.

35 In the figures, A represents the main frame of the machine, in and by which the operative parts are supported, extended somewhat on one side to form a support for the main shaft D and the gearing attached thereto.

40 Upon the top of the main frame A a hopper, B, is supported in a frame, B', which hopper is in effect twofold, being composed of two wedge-shaped hoppers, each with an aperture at the point of the wedge for distributing material therefrom upon the screens below.  
45 Upon each of the two opposite sides of the frame B' pins G H are secured, projecting from such frame and each at a little distance from the center of the length of the frame B'.  
50 These pins G H take in bearings upon the top of the frame A, as seen in Fig. 1. Rigidly at-

tached at one end to the frame B' is a crank-arm, C, whose other end is attached by a connecting rod, E, to a crank, F, attached to main shaft B. Beneath this hopper B is a series of  
55 screens, I J K, supported and adapted to move or reciprocate in guide or slide ways. (Shown in dotted lines in Fig. 1.) Such screens and their guideways and supports are of the ordinary construction, and hence are not shown  
60 or described more in detail, the mesh of the top screen being the coarsest and that of the lowest the finest. Each screen is provided at its lower end with a discharge-chute, such chutes being lettered I' J' K', emptying into a  
65 general discharge chute K<sup>2</sup>, by which the material discharged over the ends of the screens may be conveyed to any desired point. A bracket or arm, M, divides into three arms, M', each screen having an arm M' attached  
70 to it, while the arm M is attached to an eccentric, N, on main shaft D, so that a reciprocating movement may be given to the series of screens. Beneath these screens is a twofold or double hopper, L, composed, as is  
75 the hopper B, of two wedge-shaped hoppers having apertures L' L<sup>2</sup> at their bottoms. Above this hopper L and beneath the screens are inclined ways *c'* to guide the material passing through the screens into the double hop-  
80 per L. Such ways are shown in dotted lines in Fig. 1. Beneath such hopper L is the mixing-vessel O, having a conical bottom, O', while across its top is the bar P, upon which is a bearing for the shaft Q, whose lower end car-  
85 ries the agitating or mixing arms R, arranged to sweep over the conical bottom O' and thoroughly mix together the contents of the vessel O. The upper end of shaft Q carries a bevel gear-wheel, S, meshing with a bevel gear, R',  
90 on the shaft of a pulley, U, which is driven by a belt, V, receiving motion from pulley W on main shaft D.

From the mixing-vessel O a pipe, *w*, provided with a suitable stop-cock, leads to a  
95 trough, *a*, having discharge-spouts *a'* over the pans *c*, one discharge-spout for each pan. These pans *c* are supported on a pan frame or table, *f*, which is a simple frame upon whose sides the pans may rest, the latter being pro-  
100 vided with lugs or projections on their under sides taking against the frame to keep them



in position. The pans are rectangular copper boxes with bottoms and with sides at right angles thereto. Upon the bottoms of the pans are laid removable corrugated bottoms *d*, which  
 5 may be amalgamated, and which may also have free mercury in the bottoms of the corrugations for catching and saving the precious metals. The pans *c* being placed in position, the removable bottoms *d* are held in position  
 10 therein by there being placed over the tops of the sides of two adjacent pans caps *e*, whose sides depend to and are cut to fit the removable corrugated bottoms *d*, the caps being held in position by being screwed or by any other  
 15 of the ordinary means of securing two parts together upon the sides of the pans.

At the discharge ends of the pans is a discharge-chute, *O*<sup>2</sup>, by which the tailings from the pans may be conveyed to any desired point.  
 20 The pan-table *f* is supported on cross-beams *V*<sup>2</sup> in the frame, upon which and at either end are nuts *k*, in which are seated the adjustable screws *j*, which are concaved at their upper ends. In such concavities rest the lower ends of  
 25 rods *i*, whose upper ends take in concave boxes *g h* upon the under side of the pan-table, which is held down thereupon by springs *S*<sup>1</sup>, one end thereof being fastened to the pan table and the other to the frame. This supports the pan-  
 30 table on virtually ball-and-socket joints and permits its free movement in every direction. Two distinct movements are positively given to it and in directions at right angles to each other and its net movement is the resultant  
 35 thereof. These movements are given by the following devices: *m*<sup>1</sup> is a shaft journaled in the frame and carrying a bevel-gear, *q*, which meshes with a bevel-gear, *r*, on the end of a shaft, *m*<sup>2</sup>, extending transversely beneath the  
 40 pan-table and carrying and rotating a cam, *m*<sup>1</sup>, which is arranged to take for part of its rotation against a lug, *m*<sup>3</sup>, affixed to the bottom of the pan table *f*, thus moving the pan-table once during every rotation and in the  
 45 direction thereof. Springs *u* are arranged, one end being fastened to the pan-table and the other to the frame, to pull the pan-table back against spring stops or bumpers *t*, as soon as the cam *m*<sup>1</sup> is out of contact with the lug *m*<sup>3</sup>.  
 50 Upon the shaft *m*<sup>1</sup> is an eccentric, *l*, carrying an arm, *l'*, whose outer end is pivoted to the pan-table *f*. This arm *l'* has a knuckle-joint at *p*, so as to accommodate itself to the movement given the table by the cam *m*<sup>1</sup>, which  
 55 movement is at a right angle to the length of the arm *l'*. The shaft *m*<sup>1</sup> is rotated by a belt, *n*, which passes over the pulley *o* on the main shaft *D*, and over a pulley on shaft *m*<sup>1</sup>.

A pipe, *X*, is provided for furnishing water  
 60 to the mixing-chamber *O*, and a perforated pipe, *b*, to supply water to the pans *c*.

The operation is as follows: Power being applied to the main shaft and connected gearing by a crank, *V*<sup>1</sup>, or in any other suitable  
 65 manner to give the proper motion to the moving parts, the crushed material is fed into the double hopper *B*. As the crank *C*, at-

tached to its frame, is rocked by the arm *E* the frame *B* is lifted alternately at each end, pins *H*, being raised from their bearings, re-  
 70 turned thereto, while the pins *G* are lifted from their bearings, the double hopper not only being rocked, but also jarred or bumped by the joint action of these double bearings, so that the material is shaken out of the hop-  
 75 per upon the first screen violently and spread over considerable surface thereof, at the same time the screens are being reciprocated in their ways by the gearing *D*, *N*, *M*, and *M*<sup>1</sup>, and the material is sifted therethrough, such  
 80 as will not pass through the meshes of the various screens passing off by the proper chute into general discharge-chute *K*<sup>2</sup>. The lower screen, *K*, permits that only to pass which is fine enough for amalgamation. From  
 85 it the material passes into the double hopper *L*, which conveys to the mixing-vessel *O*, wherein, by the arms *R*, it is thoroughly commingled and is mixed with water. Thence the pulp passes by pipe *w*, trough *a*, and spouts  
 90 *a'* into the pans *c*, which are provided with the amalgamated corrugated removable bottoms *d*. The pan-frame *f* and pans thereon receive a transverse movement from arm *l'* and eccentric *l* and a longitudinal movement from cam  
 95 *m*<sup>1</sup> and lug *m*<sup>3</sup>, aided by springs *u*, so that the material in a pan is thrown over every part thereof, and all the mineral therein brought into contact with the mercury, so that it may be retained and saved, the refuse, water, &c.,  
 100 passing off by the chute *O*<sup>2</sup>. The inclination of the pan-table, and hence the rapidity of the movement of the material through the pans, may be regulated by the set-screws *j*, forming  
 105 part of the universal bearings for the pan-table.

Having thus described my invention, what I claim is—

1. In an ore-separator, the combination of the double or twofold hopper, consisting of  
 110 two separate divisions, each provided with an outlet, a frame supporting both divisions and provided with two pivotal pins on each of two opposite sides, bearings for such pins, and mechanism for lifting the frame and the pins  
 115 alternately from and returning them to their bearings, substantially as set forth.

2. In an ore-separator, the combination of a series of amalgamating-pans having removable corrugated bottoms *d*, and the caps *e*, se-  
 120 cured to the pans, substantially as set forth.

3. In an ore-separator, the combination of the longitudinal amalgamating-pans having removable corrugated bottoms with caps *e*, a pan table or carrier, and mechanism, as de-  
 125 scribed, for giving the pan-table and the pans thereon movements in two directions at a right angle to each other, substantially as set forth.

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

JAMES TALLEY.

Witnesses:

ED. S. CURRY,

W. D. ANTHONY.