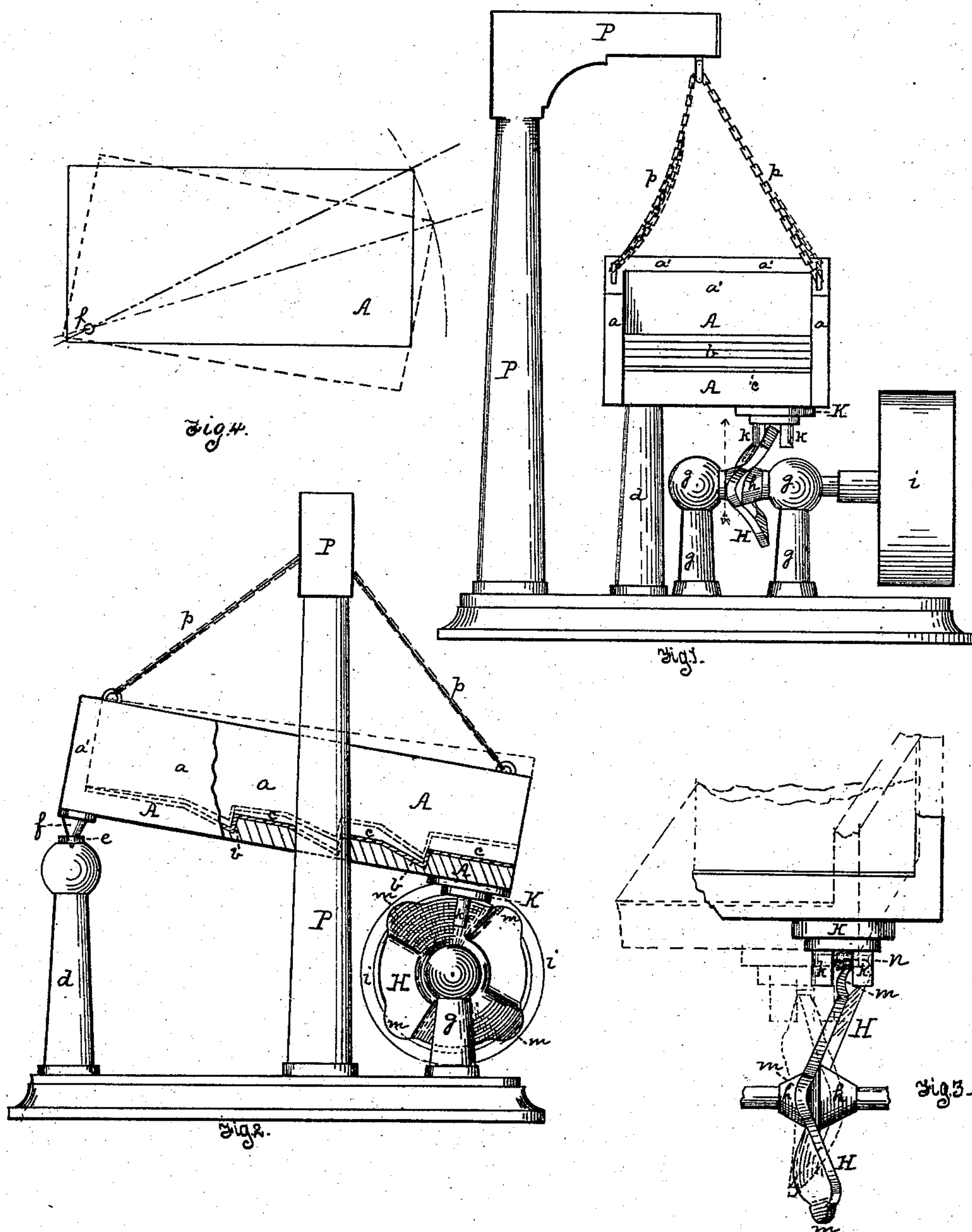


E. W. LYON.  
Ore Concentrating Pan.

No. 229,263.

Patented June 29, 1880.



WITNESSES.

Clarence Burleigh  
Geo. Elphinstone

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Edward W. Lyon  
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# UNITED STATES PATENT OFFICE.

EDWARD W. LYON, OF ALLEGHENY, PENNSYLVANIA.

## ORE-CONCENTRATING PAN.

SPECIFICATION forming part of Letters Patent No. 229,263, dated June 29, 1880.

Application filed January 16, 1880.

*To all whom it may concern:*

Be it known that I, EDWARD W. LYON, of Allegheny city, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Amalgamating and Concentrating Pans or Jigs; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a face view of my improved pan. Fig. 2 is a side view, partly broken away. Fig. 3 is a detached view illustrating the motion imparted to the pan, and Fig. 4 is a plan illustrating said motion.

Like letters of reference indicate like parts in each.

My invention relates to amalgamating pans or jigs employed for the purpose of collecting, separating, or concentrating the gold or like precious metals from sands or other loose substances in which they are found.

The special purpose of my improvement is to impart to the sand containing the precious metal a peculiar shaking motion, by means of which the particles of precious metal, being heavier than the sand with which it is mixed, will be settled to the bottom of the pan and adhere to the amalgamated surface or be caught in the riffles extending across the pan.

Heretofore the gold has been generally obtained by feeding the ore to the stamp-mill and reducing it to a pulp or impalpable mass, and then passing the sands thus reduced over stationary amalgamated tables, next passing it through the mullers, where it was mixed with the mercury, and finally through the settlers, by means of which the gold held in suspense by the mercury was settled to the bottom and removed, the sand being washed over, forming what is termed "tailings." By these apparatus about seventy-five to eighty per cent. of the gold was usually obtained. The tailings were either thrown aside as waste or treated in some other way to obtain the remaining gold.

My invention is adapted either for use in lieu of the other apparatus after the stamp-mills or for treating the tailings to obtain the balance of gold contained therein.

It consists, mainly, in an amalgamating or concentrating pan provided with riffles, said pan set at an inclination, and having a fixed pivot at one corner or at one side of the longitudinal central line, and diagonally opposite to said fixed pivot stops or lugs, between which revolves an alternately-dished cam-wheel, whereby a lateral rolling as well as a vertical motion is imparted to the pan; and, secondly, in details of construction hereinafter more specifically set forth.

To enable others skilled in the art to make and use my invention, I will describe its construction and mode of operation.

The amalgamating-pan A is formed of wood or other suitable material, being a long flat pan inclosed on the sides and upper end by the boards *a a'* of suitable height, the lower end being left open.

The bottom of the pan is provided with suitable riffles *b*, extending across it, in which the gold is concentrated, as hereinafter described. It is also covered with the amalgamated copper plate *c*, which can either be bent to the shape of the riffles or formed in sections and fitted between them, and is secured in place by any suitable means.

At the upper end of the pan A is the standard *d*, in the top of which is the socket or female part *e*, into which the rod or pivotal projection *f* extends, said projection being attached to the under surface of the pan at one corner or side of the upper end, the projection and socketed standard thus forming a pivotal support for the upper part of the pan.

Under the lower end of the pan A, mounted in suitable journals *g g*, is the irregularly-shaped cam-wheel H, the shaft of which extends beyond the journal, and is provided with the band-wheel *i* for rotating said wheel. The wheel H is adapted by its form to impart the desired motion to the pan, from which a forked arm, K, extends down on either side of the wheel. This forked arm is attached at the lower end of the pan at the side or corner diagonally opposite the pivotal point *f*. It is provided with the two forks *k k*, extending one on either side of the wheel H, and the friction-wheel *n* between said forks, which rests upon the wheel H, supporting the pan there-



on, and overcoming any friction from the rotation of the cam-wheel. If desired, friction-wheels may also be mounted on the inner sides of the forks *k* to overcome the friction between them and the sides of the cam-wheel.

The cam-wheel H is staggered or dished, its axis or shaft being horizontal, and the periphery of the wheel being alternately bent or staggered on either side of a perpendicular extending from the center of the hub *h*, thus giving to the periphery an irregular form, which imparts to the pan an alternating motion at the corner diagonally opposite the pivotal point *f*, by means of which the pan is given an alternating shake in a line diagonal to its length, said motion being a longitudinal-transverse or diagonal shake.

At certain points on the surface or periphery of the wheel H are the cams or inclined projections *m*, which serve to impart to the end of the pan a vertical rising and falling motion. These cams *m* are preferably placed so as to raise and drop the pan at the end of each side motion, so that the pan will receive first a diagonal shake in one direction, then a vertical shake, then a diagonal shake back to the original position, and then a vertical shake, this motion being repeated at each semi-revolution of the wheel. The cams may, however, be placed so as to impart the vertical shake during the diagonal shake.

The pan A is hung on the derrick or standard and cross-bar P by means of chains *p* extending to the corners of the pan, for the purpose of relieving the pivot *f* and cam-wheel H of the greater portion of the weight of the pan, and holding it in proper position thereon and preventing its sagging on either side.

The operation of my improved amalgamating and concentrating pan is as follows: The surface of the copper plate is amalgamated in the usual way, forming a surface thereon which will take up and retain any free gold coming in contact with it, and the pan is set in motion by the rotation of the cam-wheel. If the pan is used in lieu of the other apparatus before referred to for obtaining the gold, the sand from the stamp-mills is fed to the pan with a sufficient supply of water. If it is used to treat the tailings, they are fed in the same manner. The water coming in contact with the sand thins it, and is thoroughly mixed up with it by the motion of the pan and spread over the pan thereby. By the diagonal motion of the pan the sand and water are given a partially side, partially backward shake, which spreads it evenly over the pan, causing a thorough intermingling of sand and water and the shaking and settling of the gold to the bottom, to be caught by the amalgamated surface of the pan or concentrated in the riffles. As the pivot *f* is a fixed pivot, there can be no longitudinal or endwise motion of the pan which would tend to discharge its contents; but as the motion is an oscillatory or swirling motion, there is a backward and upward mo-

tion given to the sand, &c., which insures the settling and recovery of the metallic particles. At the end of each stroke the vertical shake imparted by the cams *m* on the periphery of the wheel H serves to prevent the gathering of the sand on the surface of the pan and to throw up the lighter sand out of the riffles, settling the heavy particles of gold therein. In conjunction with the diagonal shake, the vertical motion serves to impart a semi-rolling motion to the sand, and by turning over the sand brings all its particles in contact with the amalgamated surface of the pan, which then absorbs and retains the gold contained therein, allowing the water to wash away the sand. If the pan is used in lieu of the other apparatus after the stamp-mill, it may be necessary to use a series of two or more pans, the sand passing from one pan to the next by means of suitable troughs or sluice-boxes. The apparatus is operated until a sufficient amount of gold is obtained in the riffles and on the amalgamated surface of the pan, when the riffles are cleaned and the surface scraped in the usual way, the plate being changed for another one already amalgamated, if desired. If a greater shake is desired, it can be obtained by moving either the pivot *f* and standard *d*, or the cam-wheel H, or both, farther under the pan, when, as the motion is applied nearer the pivotal point, it will give a stronger shake.

By my improved pan the gold can be saved at less expense than by the apparatus heretofore generally employed, and in treating the tailings a large proportion of the gold contained therein can be saved.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with an inclined amalgamating or concentrating pan having riffles and provided with a fixed pivot at one side of one end, and with forked arms or lugs located diagonally opposite the fixed pivot, of an alternately-dished cam-wheel located diagonally opposite the fixed pivot of the pan, whereby a combined diagonal and vertical shaking motion may be imparted to the pan, substantially as and for the purpose specified.

2. The combination, with an inclined amalgamating or concentrating pan having riffles and provided at one side of one end with a fixed pivot, and with a fork or lugs located diagonally opposite to the fixed pivot, of an alternately-dished cam-wheel for imparting a rolling motion to the pan, and the derrick and suspension-chains for relieving the cam-wheel of a portion of the weight of the amalgamating-pan, substantially as and for the purposes specified.

In testimony whereof I, the said EDWARD W. LYON, have hereunto set my hand.

EDWARD W. LYON.

Witnesses:

JAMES I. KAY,  
JOHN GIBSON.