No. 678,819. Patented July 16, 1901.

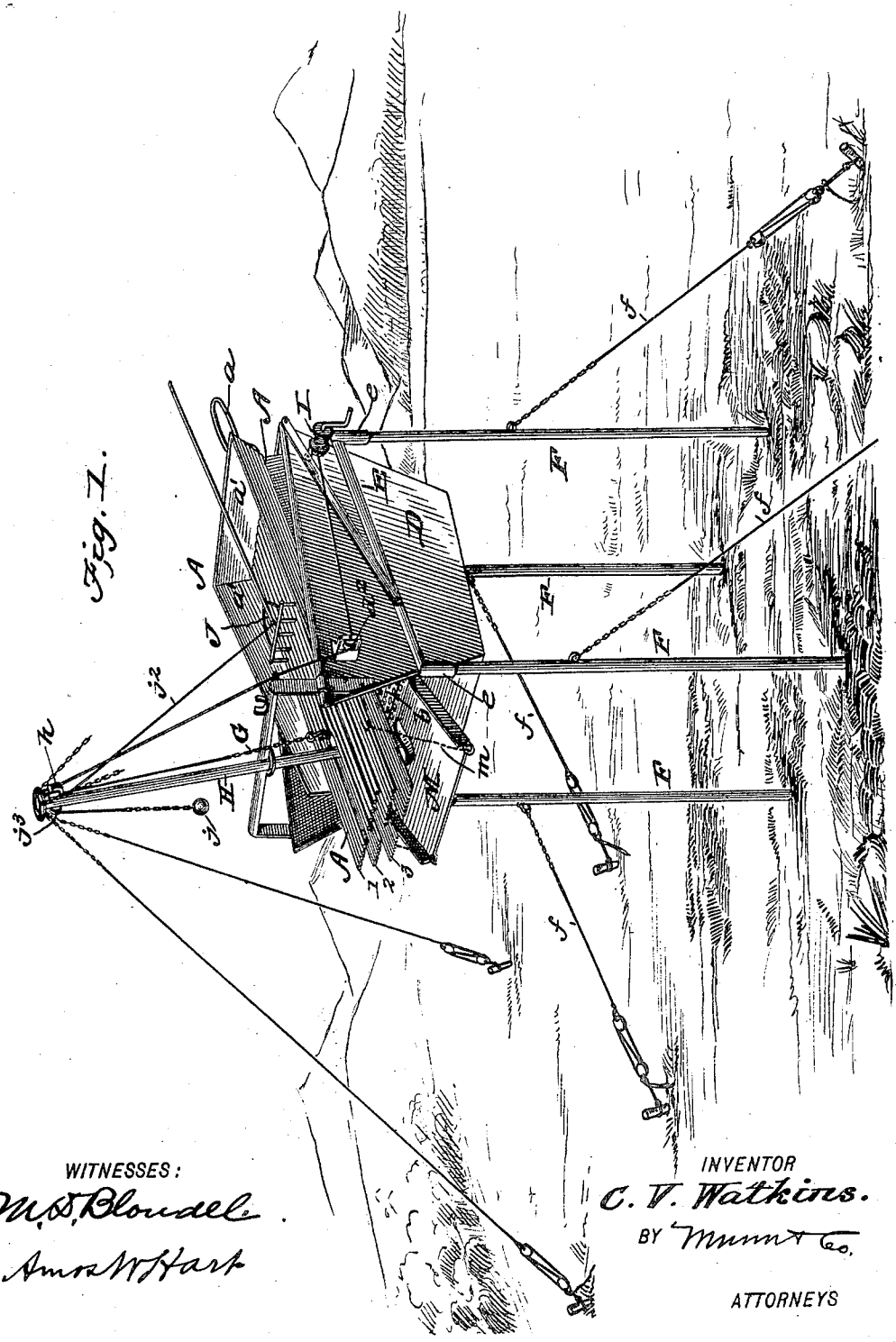
C. V. WATKINS.

ORE WASHER AND SEPARATOR.

(Application filed Aug. 27, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

W. S. Blondell.

Amos W. Hart

INVENTOR

C. V. Watkins.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 678,819. Patented July 16, 1901.

C. V. WATKINS.

ORE WASHER AND SEPARATOR.

(No Model.) (Application filed Aug. 27, 1900.) 3 Sheets—Sheet 2.

Fig. 2.

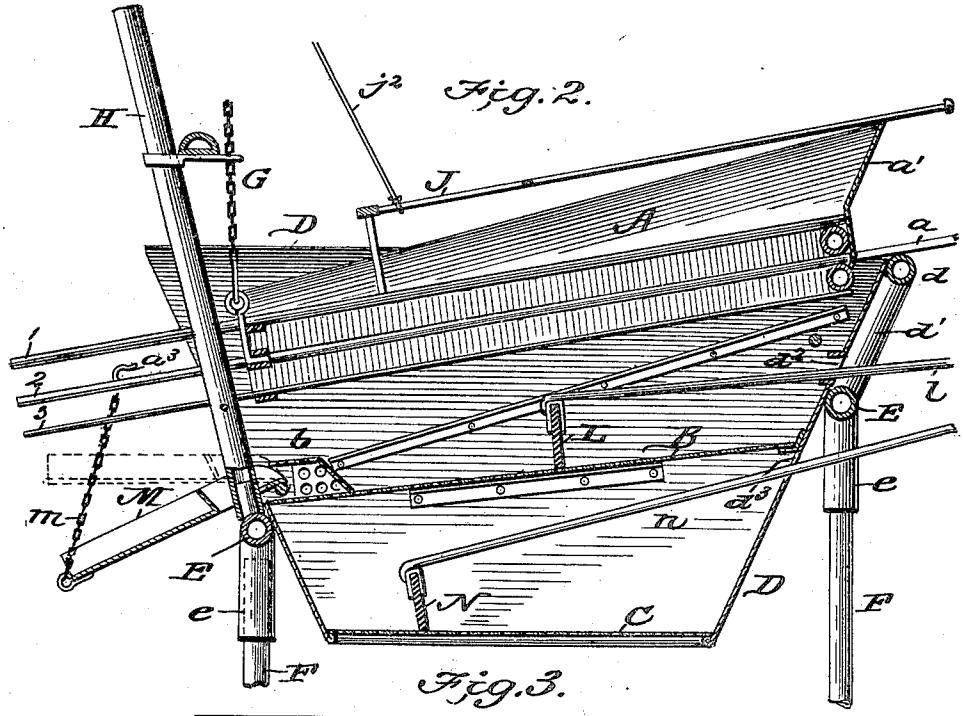
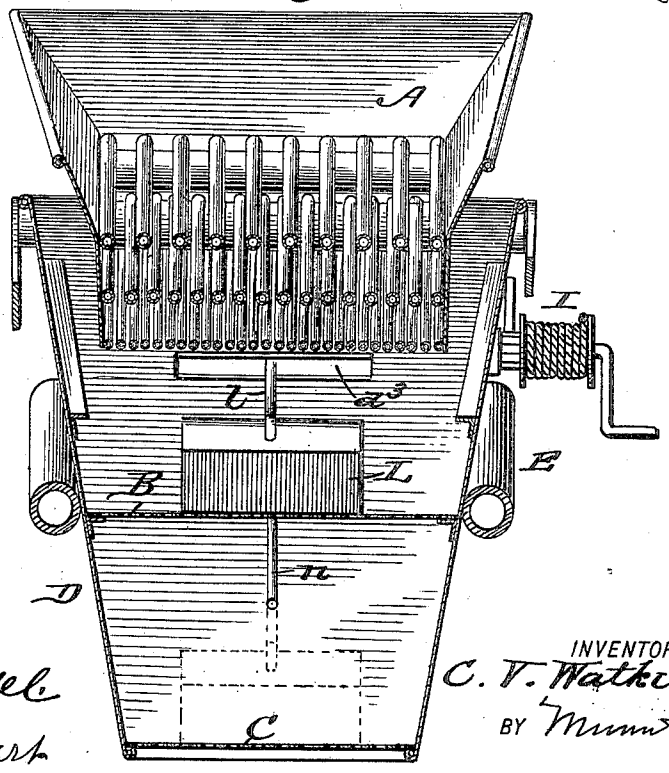


Fig. 3.



WITNESSES:

M. B. Blondel

Amos W. Hart

INVENTOR

C. V. Watkins.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 678,819. Patented July 16, 1901.

C. V. WATKINS.

ORE WASHER AND SEPARATOR.

(Application filed Aug. 27, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 4.

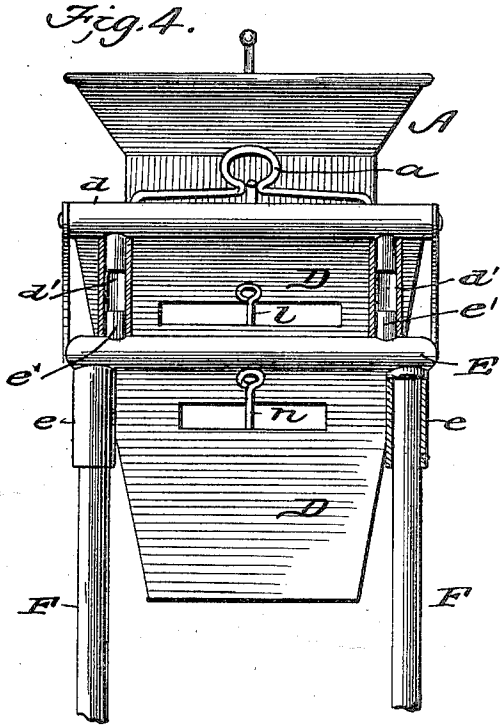
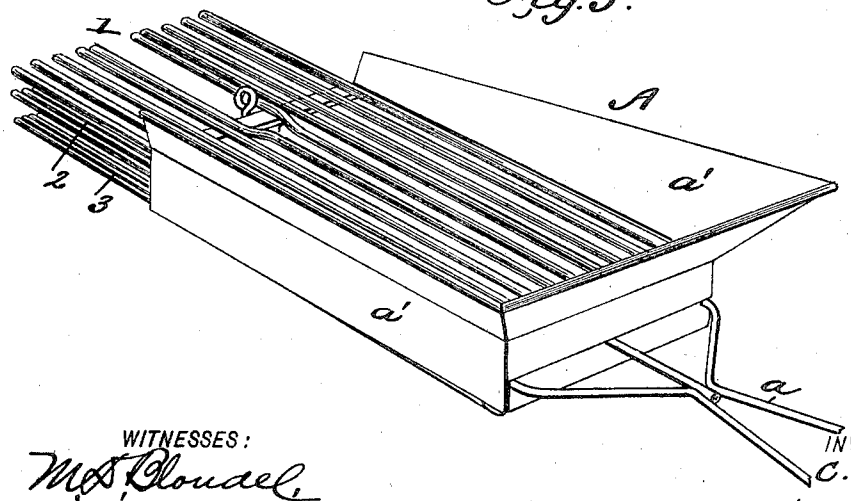


Fig. 5.



WITNESSES:

M. S. Bloudel.

Amos W. Hart.

INVENTOR

C. V. Watkins.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES V. WATKINS, OF VINEGAR'S LANDING, WASHINGTON, ASSIGNOR OF ONE-HALF TO HENRY P. HOLDEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

ORE WASHER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 678,819, dated July 16, 1901.

Application filed August 27, 1900. Serial No. 28,151. (No model.)

To all whom it may concern:

Be it known that I, CHARLES VINEGAR WATKINS, of Vinegar's Landing, in the county of Garfield and State of Washington, have invented a new and useful Improvement in Ore Washers and Separators, of which the following is a specification.

It is the object of my invention to provide an improved apparatus for treating sand and other placer material, as well as artificially-pulverized ore, for separating therefrom the gold or other precious metals contained therein. It is particularly adapted for treating such material in large quantity and with great rapidity.

The construction, arrangement, and operation of the apparatus are as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the apparatus set up for use. Fig. 2 is a central longitudinal section. Fig. 3 is a vertical transverse section. Fig. 4 is an end view of the apparatus. Fig. 5 is a perspective view of riddle.

The metal-bearing sand or crushed ore to be treated is delivered by any suitable means upon a riddle A, (sometimes termed a "grizzly" in portions of the ore-producing Western States,) through which the finer portion passes onto an inclined screen or sieve B. Such portion as passes through this screen drops upon the horizontal screen C. These parts A B C are arranged and supported in a large box-like holder or hopper D, which is constructed of heavy galvanized plate-iron and tapered or contracted toward its lower end. Such hopper D is supported detachably in a rectangular frame E, composed of metal tubes and provided with four pendent sockets *e*, that receive the ends of posts F, which are also preferably formed of metal tubes. These posts F may be suitably braced by guys *f'* or otherwise supported.

The upper front portion of the hopper D has a tubular cross-bar *d* rigidly attached to it, which has two short tubular posts or arms *d'*, that project downward and fit over pins or studs *e'*, (see Fig. 4,) projecting upward from the rectangular frame E. The bar or rod *d* is further supported by inclined braces extending on the sides of the hopper. This construction strengthens the rear end of the hopper D and supports it, so that it is held immovably in the frame E, and at the same time it provides for convenient detachment of said hopper when required. The top bar *d* is also a support for the riddle or grizzly, which has a rear extension *a*, that rests directly on said bar.

The screens B C rest on ribs and, together with the riddle A, are easily detachable. The hopper D being also detachable from its supporting-frame E, and this in turn from the posts F, it is apparent the entire apparatus may be quickly dismembered or set up.

The riddle or grizzly A consists in part of three longitudinal parallel rows 1 2 3 of rods, which are constructed of iron or steel tubes. The rods of the upper row 1 are larger than those of the second 2, and the latter are also larger than those of the lower row 3. The rods are also separated more widely in the upper row than the second and more in the latter than the third. By this construction the upper row 1 separates the coarser portions of the material, the next row 2 the next size, and the third row 3 the next, and such separated portions pass off over the free ends of the rods. The riddle is supported adjustably at a point about one-third the distance from its front end by means of a chain G, that passes over a pulley *h* on a post H, and thence over a pulley d^2 on the side of hopper D, and thence to a winding shaft or windlass I, also attached to the hopper and having a pawl for locking it. By rotating the crank of a windlass I the riddle A obviously will be raised or lowered as conditions require, the point of contact of the rear handle extension *a* being the fulcrum. The width of the riddle A is so much less than the upper flared portion of the hopper D that it may be oscillated or vibrated laterally as may be required to shake down or settle the material deposited on it. For this purpose the operator seizes the handle *a* and alternately pushes and pulls laterally, the handle sliding on the bar *d* in such movement. I employ a rake J, having a long handle, for working and breaking up sticky or lumpy ores. For this purpose the rake is moved parallel with the bars

or rods of the riddle A, and to render its operation easier its weight is partly counterbalanced by a weight j, (see Fig. 1,) which is suspended by a cord j^2, passing over a pulley j^3 on post H. The weight also aids in pulling the rake J toward the post when drawn back by hand. The screens B and C are preferably constructed, as shown, of smooth flat perforated metal plates. The upper one B is inclined downward from front to rear at a slight angle to facilitate discharge of heavy and coarse material therefrom. A scraper L, consisting of a flexible rubber plate or strip and a long handle l, is employed to move the material on the screen B, and especially to push rearward such portion as cannot pass through the screen. The handle l works through a transverse slot d^2 in the front end of the hopper D. The rear or lower end of the screen B has an upward extension or bridge b, that serves to carry the coarse material over upon a tray or broad spout M, that is hinged to the hopper and within the bridge b. The free or outer end of the spout M is sustained adjustably by chains m, that extend and are attached to hooks a^3 on the overhanging end of the grizzly A. The spout M is hence raised or lowered—that is to say, tilted—along with the grizzly. It is intended the spout shall be set inclined upward, as shown by dotted lines, Fig. 2, when material is being treated, so that water or fine material dropping from the riddle A will be caught and turned into the hopper, the same passing down through the upper screen B, as will be readily understood. The hollow post H passes through an opening in the spout M and is set removably (see Fig. 2) on a pin e', projecting from the frame E. A flange extends around the post H to prevent escape of water, sand, or ore through the opening in the spout M. A scraper N, having a handle n, works on the lower level screen C. The said handle n projects through a transverse slot d^3 in the front end of the hopper D. The scraper N is worked back and forth to move the material over the screen C and facilitate passage of the latter so far as practicable. The slots for the rake-handles l and n serve also for inspection of the condition and quantity of material on the screens B and C. As shown, the riddle has flaring sides a', extended upward around the portion in rear of the point of attachment of the suspending-chain G. Thus the riddle is so far converted into a hopper adapted to receive the material to be treated. The riddle is raised or tilted to discharge coarse material by elevating its rear end by means of its handle a, which operation may be effected easily and quickly. It is apparent the angle of the riddle to the fulcrum d will depend on conditions—such as the kind, quality, condition, and arrangement of the material delivered upon it and the progress of the separation of the finer parts from the coarser. I provide on the front of the hopper a U-shaped keeper for support of a hose, that may be used for delivering water upon the material on the riddle.

What I claim is—

1. In apparatus of the class described, the combination with the hopper, its support-frame, and a post set on the latter, of a rake having a handle and a weighted rope attached to said rake and passing over a pulley on the post, as shown and described.

2. In apparatus of the class described, the combination with the supporting-frame and hopper, and the riddle fulcrumed as specified, and a hoisting-chain attached to its front portion, a screen arranged below the riddle, and a broad spout hinged at the end of the hopper and connected at its free end to the overhanging end of the riddle, as shown and described, whereby the spout and riddle may be raised and lowered together, as specified.

3. In an apparatus of the class described, the combination, with the hopper, and a spout M hinged in and projecting from the rear end of the same, of a screen arranged within the hopper and having a perforated bridge b consisting of a raised portion which extends over the hinged end of said spout and whose inner side is sloped, as shown and described.

4. In apparatus of the class described, the combination with a rectangular supporting-frame, having pins on the front bar, of the hopper, adapted to fit therein and having arms d' attached at its front end, and provided with sockets to receive said pins as shown and described, and inclined braces extending from the sides of said frame to the upper angle of the hopper whereby the hopper is held immovable but adapted for convenient detachment, as specified.

CHARLES V. WATKINS.

Witnesses:
AMOS W. HART,
SOLON C. KEMON.