G. W. PALMER.

DRY GOLD WASHER.

APPLICATION FILED MAR. 17, 1909.

954,580. Patented Apr. 12, 1910.

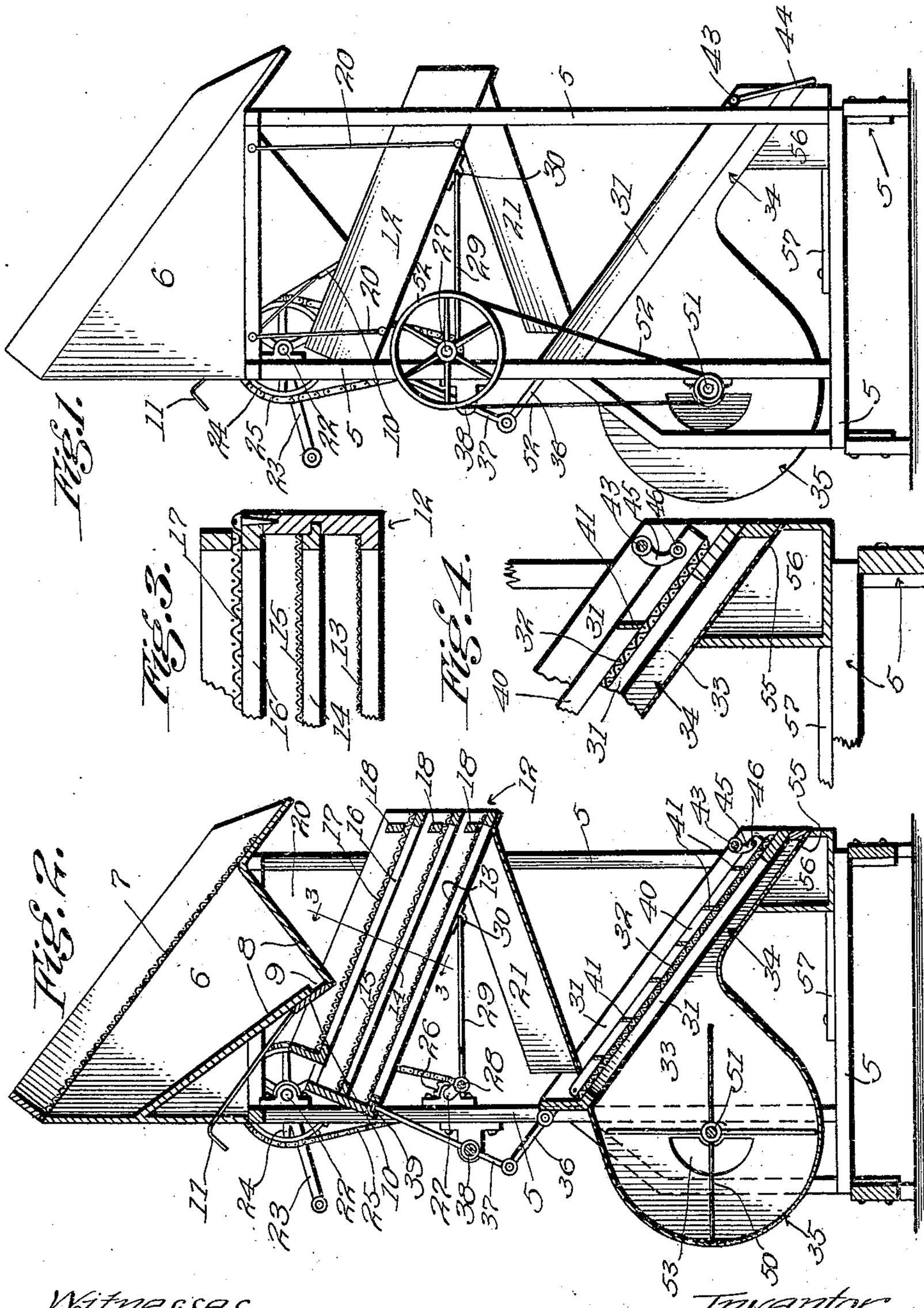

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 2.

Witnesses
Stan A Clark
Edgar Koopman

Inventor
George W. Palmer
James T. Barkelew
Attorney

UNITED STATES PATENT OFFICE.

GEORGE W. PALMER, OF REDLANDS, CALIFORNIA.

DRY GOLD-WASHER.

954,580. Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed March 17, 1909. Serial No. 484,044.

To all whom it may concern:

Be it known that I, GEORGE W. PALMER, a citizen of the United States, residing at Redlands, in the county of San Bernardino and State of California, have invented new and useful Improvements in Dry Gold-Washers, of which the following is a specification.

In the dry gold washer at present in use the coarse dirt is not separated from the fine sand and dirt containing the gold to a sufficient degree to enable all or nearly all of the gold to be finally obtained, the presence of a large amount of dirt preventing the recovery of the gold as it is worked over the riffles.

It is the object of the present invention to provide a device whereby the coarse dirt is completely separated from the gold bearing sand before the riffles are reached, so that it only remains for the action of the riffles and accompanying parts to separate the gold and finer sand from the coarse sand. This object is accomplished by the provision of a plurality of separating screens through and over which the gold bearing said and dirt passes, the screens successively removing the coarser parts of the dirt. After passing through the screens the gold and fine sand drop onto a pan leading to the riffles and screen where the coarser of the fine sand is removed by agitation and the action of air. The riffles are of a special construction so as to facilitate the complete separation of the gold, which is finally caught in a pan at the bottom of the machine.

In the accompanying drawings:—Figure 1 is a side elevation of the machine. Fig. 2 is a vertical cross section of the same. Fig. 3 is an enlarged sectional detail taken on line 3—3 of Fig. 2. Fig. 4 is an enlarged view of the parts shown in the lower right hand corner of Fig. 2.

Referring to the drawings, Fig. 5 designates a frame of suitable size and configuration for the support of the parts to be described hereinafter, being made of wood in the present construction and rectangular in configuration. At the upper end of the frame is supported a hopper 6 having an inclined screen 7 stretched over its upper opening, this screen being of a relatively coarse mesh and adapted to prevent the larger particles of the dirt thrown thereon from entering the hopper. The bottom 8 of the hopper is inclined toward a point near the center of the frame of the machine and a small opening 9 is left at this point and controlled by a slide 10 operated through the medium of a rod 11.

Directly below opening 9 are arranged the screens used to separate the coarser dirt from the finer gold bearing material. The construction is shown more in detail in Fig. 3. A box 12 having an open top and end is provided with a bottom of comparatively fine mesh screen 13, this screen being the last one over which the dirt is passed in its separation from the gold bearing material before being fed to the riffles. The sides of the box 12 are slotted about half way up their height and a screen frame 14 carrying a screen 15 is placed in the slots and thereby held in position. Screen 15 is of a slightly coarser mesh than screen 13. Secured to the top of the box in any approved manner is a frame 16 supporting a third screen 17 of a still coarser mesh. At the lower end of each of these screens is a bar 18 which keeps the dirt from passing over the screen too quickly for the separation of the heavier gold bearing material therefrom. The upper bar is the highest of the three as the upper screen handles more dirt than the lower ones. The three screens are supported in the position shown by pivoted supporting rods 20 secured to the frame and to the sides of box 12. The whole is supported at an angle so that the dirt will pass over the screens forwardly and fall from the front of the machine to the ground. Secured to the forward end of the box and sloping rearwardly is a pan 21 which leads the fine material passing through the three screens to the back side of the frame where it discharges onto the riffles. This pan is of such size that it catches all of the fine particles passing through the third screen.

Mounted in the upper end of the frame is a shaft having a crank 23 on its end so that it may be manually rotated. A sprocket wheel 24 is mounted on this shaft and a chain 25 connects sprocket wheel 24 with a smaller wheel 26 on a shaft 27. Shaft 27 has a crank 28 thereon to which a rod 29 connects. Rod 29 is of such a length and

configuration as to attach to crank 28 and also to the lower edges of box 12 as at 30. By the rotation of crank 23 it will be seen that box 12 and the screens therein will be vibrated quickly and that the dirt upon the screens will be agitated so that the heavier and finer particles are given opportunity to settle to the bottom and pass through the screen, while the coarser and lighter particles roll down the screen and out of the machine. The fine material which passes through screen 17 falls onto screen 15, where the separation is repeated and only the finer and heavier particles again pass through the screen. This operation is again repeated on the lower screen, and the material which passes through the last screen into pan 21 is only that of a very fine nature and is also mostly composed of the heaviest particles. The relative sizes of mesh of the screens are so arranged, and the size of the mesh of the lowest screen so chosen that only the fine particles of gold and the fine black sand accompanying it fall onto pan 21.

To perform the final operation of separating the gold as far as possible the usual riffle screen is provided in the lower part of the machine. An inclined frame 31 is provided with a bottom screen 32 of a very fine mesh, or this screen may be composed of a number of layers of fabric placed over each other, the object being to prevent the passage through the screen of all but the very finest particles of gold and sand. Frame 31 rests upon side board 33 of the wind box 34 and fan chamber 35, being supported, and vibrated when the machine is in motion, through the medium of a connecting rod 36 secured to the upper end of the frame and also to a lever 37. Lever 37 is pivoted at 38 to the frame and extends upwardly so that its end enters a recess 39 in the under side of box 12. When box 12 is vibrated the riffle screen frame is also vibrated, but to a lesser extent, as it will be seen that the relative lengths of the arms of lever 37 are fixed for this purpose. Secured to frame 31 is a riffle frame 40 having riffles 41 thereon at appropriate intervals. The riffle frame is pivoted at 42 to frame 31 so that its lower end may be lifted when so desired. Across the lower end of frame 31 is arranged a small shaft 43 having on one of its outer ends a handle 44. Also mounted on shaft 43 is an arm 45 which is loosely attached by pin 46 to the lower end of the riffle frame, so that, by swinging handle 44, the lower end of the riffle frame may be lowered and held in place or raised so as to allow the material behind the riffles to run down over the screen. Arm 45 is so placed that when handle 44 is swung downwardly the riffle frame is wedged into place.

Situated in chamber 35 is a fan 50 mounted on a shaft 51. Shaft 51 is driven through the medium of a belt connection 52 with shaft 27, the relative sizes of the pulleys being such that shaft 51 and the fan are driven at a high rate of speed. An inlet 53 in the wall of the fan chamber admits the air which is thrown against screen 32, producing a pressure through the fine meshes of the screen which lifts the lighter particles over the riffles and allows them to fall out of the machine, only the heavier and finest particles of sand passing through the screen with the gold. All of these particles are carried by the air current into wind box 34 and pass through holes 55 in the lowermost portion thereof into a collecting box 56. Box 56 is removably held in place by means of buttons 57 which may be turned to allow the moving of the box toward the left in the drawings and then out of the machine. The escape of air through the meshes of screen 32 causes a downwardly flowing current along the underside of the screen in wind box 34. This current has a tendency to carry the gold with it toward the bottom of the wind box where it can fall into the collecting box. If the collecting box were placed so that the gold must move against the air current in order to reach it, there would not be an efficient collection of the gold, some being left along the box. Only the very finest particles of sand pass into the collection box along with the gold, so that a clean up is obtained from this machine which averaged high in gold proportion.

There are many minor changes that may be made in the construction without impairing the utility of the machine.

For power purposes I propose to utilize a machine composed practically of two of the machines placed side by side, so that a single central feeder may supply both of their hoppers 6. Fan 50 may also be made after other designs than that shown, it being possible, and also desirable in some cases, to use a double fan. In a power installation of this character the fan may be done away with entirely on each machine and the air pressure supplied from a common air main.

The proportions of the machine in general and the sizes of the screen meshes may be varied to suit local conditions as to quality of material to be handled.

Having described my invention, I claim:—

In a dry washer, an inclined screen, a wind box under the screen, the box extending from one end to the other of the screen and having its lowest point at the bottom of the screen, a fan casing inclosing a fan

space in communication with the upper end of the box, a fan in the casing adapted to force air out of the box through the screen, and a collecting box under the lowermost part of the wind box, the wind box being provided with an opening in its bottom leading to the collecting box.

In witness that I claim the foregoing I have hereunto subscribed my name this 11th day of March 1909.

GEORGE W. PALMER.

Witnesses:

ROBT. T. CURTIS,

PHILIP RAUSCH.