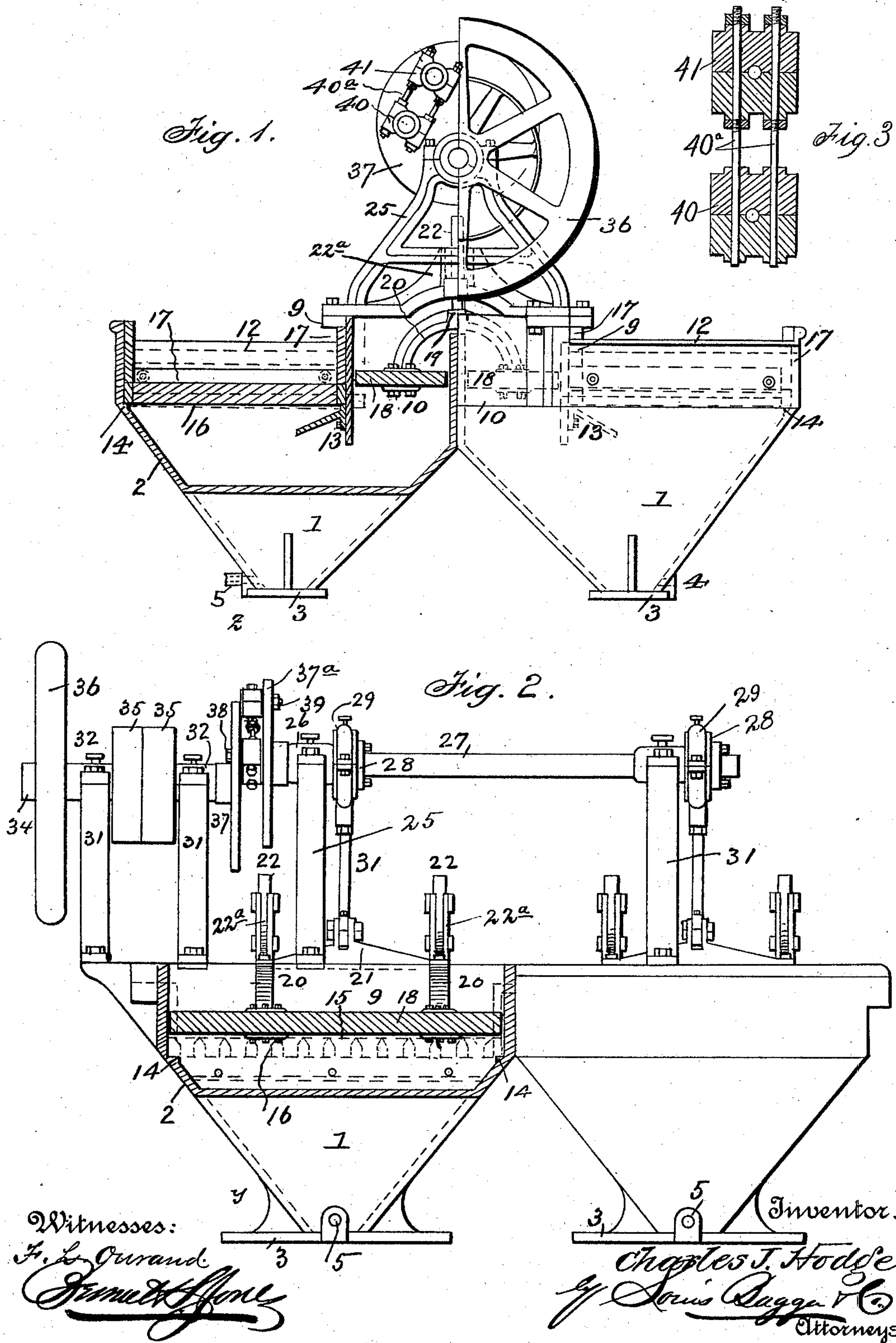


(No Model.)

C. J. HODGE.  
JIG FOR MINERAL OR ORE WASHING.

No. 575,236.

Patented Jan. 12, 1897.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## JIG FOR MINERAL OR ORE WASHING.

SPECIFICATION forming part of Letters Patent No. 575,236, dated January 12, 1897.

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*To all whom it may concern:*

Be it known that I, CHARLES J. HODGE, a citizen of the United States, and a resident of Houghton, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Jigs for Mineral or Ore Washing; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to apparatus for washing minerals; and its object is to provide an improved construction of the same whereby coal, ore, and other like substances can be washed and cleansed of earth and other impurities in a rapid and efficient manner.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a view, partly in elevation and partly in longitudinal section, of an ore-washing apparatus constructed in accordance with my invention. Fig. 2 is an elevation, partly in transverse section. Fig. 3 is a detail sectional view of the means for connecting the disks of the driving and counter shafts.

In the said drawings the reference-numeral 1 designates two tanks or hutches cast integral with each other, the sides 2 of which incline or converge downwardly toward each other and are secured or formed with bases 3, which form supports for the apparatus. Both of these tanks are identical in construction, and a description of one, therefore, will be sufficient to enable the construction and operation to be readily understood. At the contracted lower end the tank is formed with an opening 4, with which is connected a discharge-pipe 5. The upper ends of the walls or sides of the tank are vertical, forming a rectangular space, which is divided by means of transverse partitions 9 into two compartments 10 and 12. This partition extends the entire width of the tank and is provided with a rib or shoulder 13. A corresponding shoulder 14 is formed on the opposite side of the tank, and on these shoulders rests a sieve 15, consisting of a latticed frame 16, upon

which the screen rests. This sieve or screen is held in place by transverse wooden strips 17, bolted to the tank and partition, with the lower edges or sides resting on the sieve or screen. Located in each of the compartments 10 is a reciprocating plunger consisting of a rectangular wooden board 18, to which is secured, near each end, an arch 20, which spans the inner wall or partition which divides or separates the tanks from each other. These arches are connected by means of a cross-head 21. Fitting in central sockets 19 of said arches are vertical guide-rods 22, which work in stationary cross-heads 22<sup>a</sup>, secured to the tanks; also secured to the tanks are pedestals 25, having bearings 26, in which is journaled a horizontal shaft 27, provided with eccentrics 28. Engaging with these eccentrics are eccentric straps or bands 29, connected by pitmen 30 with the reciprocating cross-head 21.

The numeral 31 designates pedestals at one end of the apparatus, provided with bearings 32, in which is journaled a driving-shaft 34, located a slight distance below the eccentric or counter shaft and provided with fast and loose pulleys 35 and a fly-wheel 36. The inner or adjoining ends of said shafts are provided with disks 37, having wrist-pins 38, which are connected with wrist-pins 39 on the disk 37<sup>a</sup>, secured to the eccentric or counter shaft. These pins are at different distances, respectively, from the center of their shafts, and are connected together by a link consisting of two boxes 40 and 41, in which said pins are journaled. One of these boxes, 41, is provided with two rods 40<sup>a</sup>, firmly secured thereto, which pass loosely through the other box, 40, so that as the driving-shaft is rotated the pin 38 will approach to and recede from pin 39 during the revolution of its disk, imparting a variable speed to the disk and the eccentric or counter shaft, whereby the speed is increased on the downstroke of the plungers and increased on the upstroke.

The operation is as follows: The tanks are filled with water, submerging the plungers, and the material to be washed is supplied with water to the sieves and the plungers set in motion. On the downstroke of the plungers, which move in unison with each other, the water is forced up through the material,



agitating the same and separating the sand, earth, and other impurities from the mineral, which will overflow with the water at the top of the tanks. On the downstroke the mineral will settle on the sieves and the finer particles will fall to the bottom of the tanks, from which they may be removed through the discharge-pipe when a sufficient quantity has been accumulated. The deflecting-plates secured to the transverse partitions cause the water on the downstroke of the piston to be forced toward the outer side of the tanks, so as to insure uniform agitation of the mineral.

In the operation of the apparatus the plungers should have a quick downstroke, so as to force the water up through the material being washed; but the upstroke should be slow, so as to allow time for the material to settle on the sieves. This is accomplished by the disks, wrist-pins, and link constructed as described.

The driving-shaft moves or rotates at a uniform speed, and when the wrist-pins have passed the upper dead-center the pin 39 will recede from the pin 38, as seen in Fig. 1, giving a longer stroke to the link, and consequently giving an accelerated movement or increased speed to the disk of the eccentric-shaft by reason of the said wrist-pins being eccentric to each other. When the pins have passed the lower dead-point, the pin 38 will commence to approach pin 39, whereby the speed of the eccentric-shaft will be decreased. This movement will continue, causing a variable speed to be imparted to the eccentric-shaft at each revolution of the driving-shaft.

Having thus fully described my invention, what I claim is—

1. In a mineral-washing apparatus, the combination with the connected tanks, having converging lower ends and vertical upper ends, of the partitions dividing the upper ends of each of said tanks into two compartments, the vertically-reciprocating plungers located in said inner compartments, the vertical

sockets near the ends of said plungers, the guide-rods and stationary cross-heads, the arches spanning the inner wall of said tanks and the reciprocating cross-head connected therewith and means for imparting a variable speed to said plungers, substantially as described.

2. In a mineral-washing apparatus, the combination with the connected tanks, having converging lower ends and vertical upper ends, the partitions dividing the upper ends of each of said tanks into two compartments, the shoulders on said tanks and partitions, the outwardly-extending inclined deflecting-plates, the sieves supported on said shoulders and the removable strips resting upon the upper sides of said sieves, of the vertically-reciprocating plungers, the vertical sockets near the ends thereof, the guide-rods and stationary cross-heads, the arches spanning the inner wall of said tanks, the reciprocating cross-heads connected therewith and means for operating said plungers, substantially as described.

3. In a mineral-washing apparatus of the character described, the combination with the tanks and sieves, of the plungers, the cross-heads connecting the same, the pitmen, the eccentric-bands, the eccentrics, the eccentric-shaft having a variable speed, the disk at one end thereof provided with a wrist-pin, the driving-shaft provided with a corresponding disk, the wrist-pins secured to said disks eccentric to each other, the boxes in which said pins are journaled and the rods secured to one of said boxes, and movable or slidable in the other; substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

CHARLES J. HODGE.

Witnesses:

EDW. E. LELAND,  
JOSEPH W. LOVELL.