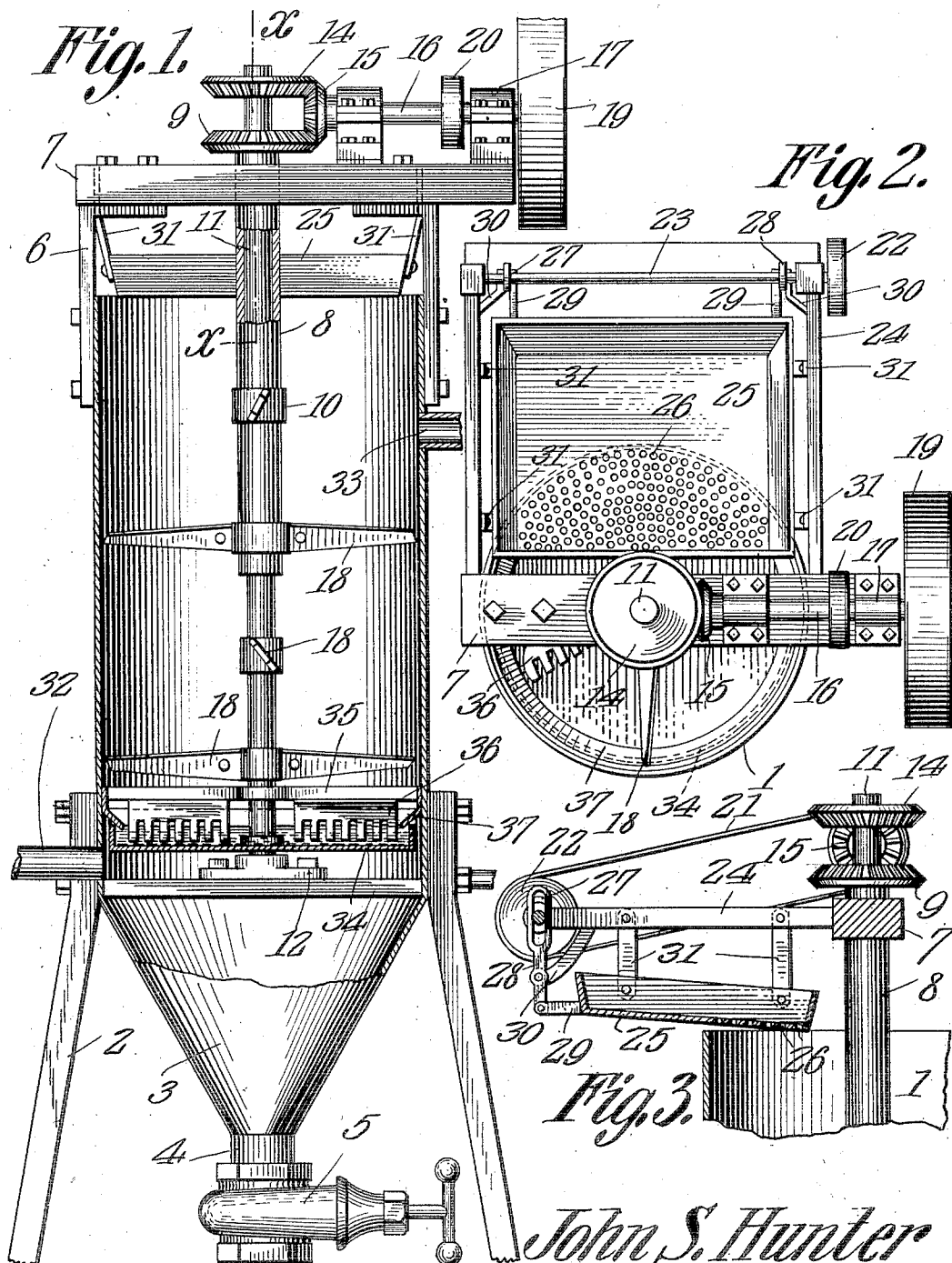


J. S. HUNTER.
ORE CONCENTRATOR.
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1,051,412.

Patented Jan. 28, 1913.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN S. HUNTER, OF LAMAR, COLORADO, ASSIGNOR OF ONE-HALF TO JOHN A. WISHARD, OF LAMAR, COLORADO.

ORE-CONCENTRATOR.

1,051,412.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN S. HUNTER, a citizen of the United States, residing at Lamar, in the county of Prowers and State of Colorado, have invented a new and useful Ore-Concentrator, of which the following is a specification.

This invention relates to ore concentrators and is especially designed for concentrating copper ore.

The object of the invention is to provide a machine of simple and durable construction which will separate or concentrate copper ore in an efficient manner, the concentrator being of very simple and durable construction and easy to operate.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings:—Figure 1 is a vertical section through the concentrator. Fig. 2 is a plan view thereof. Fig. 3 is a section on line X—X, Fig. 1.

Referring to the figures by characters of reference, 1 designates a stationary tank preferably cylindrical in form and mounted on suitable supports 2, the bottom of the tank being conical in form as indicated at 3 to constitute a receiver and provided with an outlet 4 normally closed by means of a gate valve 5 which may be of any suitable construction. Brackets 6 extend upward from the open upper end of the tank and support a cross bar 7 in which is journaled a sleeve 8 which extends downward into the tank to a point about midway of the height thereof and is provided at its upper end with a gear 9. This sleeve has preferably two pairs of oppositely extending blades 10 radiating therefrom, the blades being disposed obliquely to the plane of the axis of the sleeve, the blades of the two pairs being disposed in intersecting planes. A shaft 11 extends through and is revoluble within the sleeve, the lower end of the shaft being mounted in a bar 12 supported on a cross bar 13 suitably secured in the bottom portion of the tank. The upper end of the shaft 11 has a gear 14 secured thereto and this gear and gear 9 mesh with a bevel gear 15 secured to a shaft 16 which is journaled

in suitable bearings 17 located on the bar 7. Oppositely extending blades 18 radiate from the shaft 11 below sleeve 8 and these blades are also arranged obliquely to the plane of the axis of the shaft but they are inclined opposite to the blades 10. Preferably, two sets of these blades 18 are provided, the blades of one set being disposed within a plane extending at right angles to the blades of the other set. A drive pulley 19 is secured to the shaft 16 and another small pulley 20 is also secured to said shaft and is designed to drive a belt 21 extending over a pulley 22. This pulley is secured to a shaft 23 journaled in arms 24 extending rearwardly from bar 7. A hopper 25 is mounted above the open end of the tank and that portion of the bottom thereof directly above the tank is made up of a screen, as indicated at 26, so that material discharged into the hopper can pass through the screen and into the tank. In order that the hopper may be agitated so as to prevent the screen from becoming clogged, the shaft 23 is provided with two cranks 27 that engage slots in the upper ends of a pair of levers 28, the lower ends of which are connected with arms 29 projecting from one end of the hopper. The levers 28 are pivoted intermediate of their ends to hangers 30 that depend from the arms 24. In order to sustain the hopper for reciprocatory movements and also to hold it out of contact with the upper edge of the tank, links 31 are provided, in this instance four, that are connected at their lower ends in pairs to the opposite sides of the hopper and at their upper ends to the arms 24, as clearly shown in Fig. 3. With this construction when the shaft 23 is rotated a horizontal shaking motion is imparted to the hopper. An inlet pipe 32 opens into the tank 1 near the conical bottom thereof and an outlet pipe 33 extends from the tank adjacent the top thereof.

An amalgamating pan 34 is secured to the shaft 11 and rotates therewith, this pan being located between the bar 12 and the blades 18. Said pan is adapted to hold a quantity of quick silver for the purpose of amalgamating any free gold that may be contained in the ore. A stationary bar extends diametrically across the cylinder above this revolving pan and is provided with two opposed combs or scrapers 36 reaching nearly to the bottom of the pan and which

are provided for the purpose of keeping the ore constantly stirred up and throwing it over the edge of the pan into the conical base.

5 A collar 27 is secured to the interior of the cylinder 1 and extends downwardly over the wall of the pan so as to direct the ore into the pan.

10 In using the apparatus the ore is first pulverized in any preferred manner and then fed into the tank by directing it to the hopper 25, which permits only particles of predetermined sizes to pass into the tank. Water is supplied under a head through 15 pipe 32 and passes outward through pipe 33, and the shaft 11 and sleeve 8 are rotated rapidly in opposite directions by the gears 9, 14 and 15. Arms 18 will thoroughly agitate the water and the particles commingled therewith, and by reason of the slant of the blades the lighter particles will be thrown upward thereby and will pass outward through pipe 30 with the overflow. The 20 heavier and more valuable particles will, however, settle into the conical bottom 3 from which they can be subsequently removed by opening the valve 5. It is to be understood that the shaft 11 and sleeve 8 rotate very rapidly so that the contents of 30 the tank will be thoroughly agitated constantly.

What is claimed is:—

1. In an ore concentrator the combination with a stationary tank having a water 35 inlet adjacent the bottom thereof, and a water outlet adjacent the top thereof; of a

sleeve revolubly mounted and depending within the tank, a shaft revoluble within the sleeve and extending therebelow, blades radiating from and secured to the sleeve and shaft, each of the blades upon the sleeve and shaft having its upper face inclined transversely, the blades on the shaft being inclined oppositely to the blades on the sleeve, and mechanism for rotating the sleeve and shaft in opposite directions simultaneously, said blades being disposed to direct material upward toward the outlet.

2. In a machine of the character described, the combination with a stationary 50 tank, and a receiver extending from the bottom thereof and having a valved outlet; of a revoluble sleeve extending into the upper portion of the tank, a shaft revoluble within the sleeve and extending therebelow, blades 55 radiating from the sleeve and shaft, each of the blades of the sleeve and shaft having its upper face inclined transversely, the blades on the shaft being inclined oppositely to the blades on the sleeve, and means for simultaneously rotating the sleeve and shaft in 60 opposite directions to raise material within the tank, said tank having a lower water inlet and an upper water outlet.

In testimony that I claim the foregoing as 65 my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN S. HUNTER.

Witnesses:

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