P. R. STANHOPE.

ORE CONCENTRATING LAUNDER.

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1,029,089.

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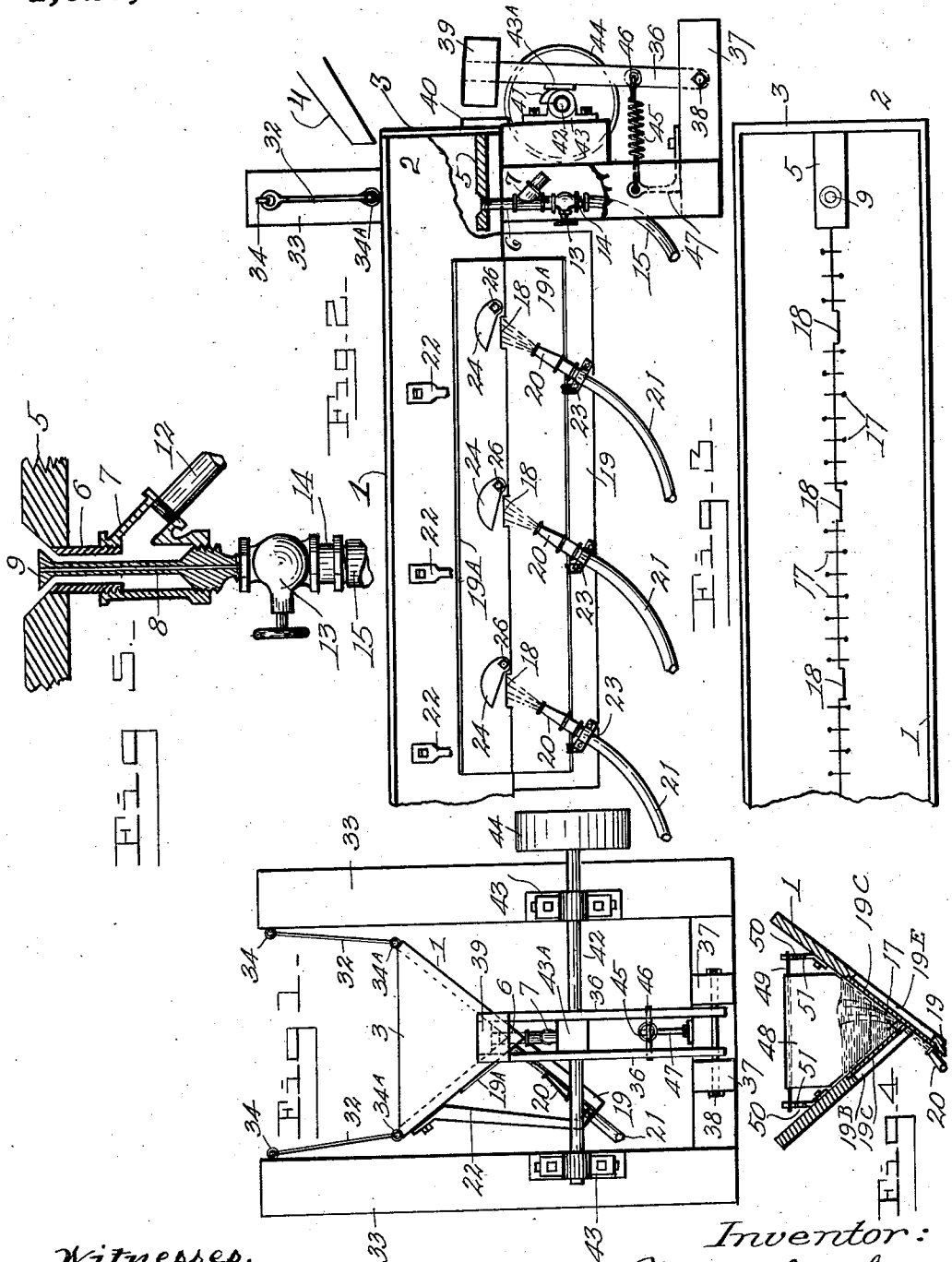

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PHILIP R. STANHOPE, OF DENVER, COLORADO.

ORE-CONCENTRATING LAUNDER.

1,029,089. Specification of Letters Patent. Patented June 11, 1912.

Application filed August 12, 1911. Serial No. 643,743.

To all whom it may concern:

Be it known that I, PHILIP R. STANHOPE, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Ore-Concentrating Launder, of which the following is a specification.

My invention relates to improvements in ore concentrating launders, and the objects of my invention are: first, to provide a V-shaped launder having a hydraulic ore agitating and mineral concentrates collecting mechanism, and second, to provide an ore concentrating launder that is provided with an adjustable means of catching floating slime mineral, and a hydraulic and also a mechanical ore pulp agitating and separating and a riffling mechanism. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is an end view of the machine. Fig. 2 is a side view of the feed end of the machine. Fig. 3 is a plan view of the portion of the launder shown in Fig. 2. Fig. 4 is a transverse sectional view of the launder showing a slimes catching device connected therewith, and Fig. 5 is an enlarged sectional view of the jet separator, a portion of the launder being shown.

Similar reference numerals refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates a V-shaped launder having its feed end 2 closed by a boarding 3. A chute 4 is arranged to discharge ore pulp from a stamp or other ore crushing mill, or from an ore grinding mill, into the feed end portion of the launder. A strip of wood 5, is secured flatwise along the bottom of the head end portion of the launder for a short distance, in order to form a connecting support for one end of a vertical pipe nipple 6, which is extended up through an aperture formed in the angular bottom edge of the launder, into an aperture formed in the strip 5, to receive it. A Y pipe fitting 7 is secured to the lower end of this nipple, with its adjacent pair of apertures depending from the nipple, and a valve stem 8, is threaded to the vertical entrance to the Y, which extends through the Y and the nipple to its upper end, where it is provided with an inverted conical head 9, that forms a valve, and the top edge of the nipple is provided with a beveled edge opposite to the bevel of the valve, and the space between the end of the nipple and around the sides of the valve forms an entrance passage for the settled mineral particles, which work down into the body of the nipple, into and through the passage into the other portion of the Y fitting, and out through a discharge pipe 12, that is threaded to its end, through which it flows and discharges to a storage bin, which I do not illustrate. This valve stem can be moved up or down by turning it in its thread in the end of the Y, to increase or decrease the size of the mineral inlet into the pipe nipple. This valve I term a water jet regulating valve. The opposite end of the valve stem is threaded, and a hand wheel valve 13, is threadedly connected to it. A nipple 14, is connected to the opposite end of the hand wheel valve, and a hose 15, is connected to the nipple. This hose is adapted to extend to a supply of clear water under pressure, which, when the hand wheel valve is open, flows through the stem into the bottom of the launder, as will be explained more fully hereafter.

From the end of the strip 5, the bottom of the launder is V-shaped, and extends in this V-shaped form throughout the rest of the length of the launder, which may be of any predetermined length, and in its opposite sides close to its bottom rows of nails, 17, are driven into it a portion of the length of the nails, leaving the remainder of the nails projecting from the insides of the trough. These nails form riffles, and they are placed to stand out the same distance from the wood and are preferably arranged so that they intermesh with each other, but are separated from each other by a small space, being preferably set about one inch apart, in each row. Consequently the spaces between the head ends of the nails would be about half an inch.

At predetermined distances apart along the length of the launder I form concentrates discharging apertures 18, in one side of the bottom of the launder at predetermined and equal distances apart between the jet valve and the opposite end of the launder. These concentrates discharging apertures 18, may be of any desired form, and they are arranged to discharge onto an apron 19, that extends from the bottom edge of the launder at such a downward angle as will permit the concentrates to wash across the apron. This apron preferably consists of a board that forms a continuation of the

board that forms the opposite side of the launder from these outlets, and it is preferably covered at and adjacent to the outlet apertures 18, with a piece of sheet iron 19A.

In the construction shown in Fig. 4, the plate 19A is dispensed with, and the opposite sides of the trough are provided with rabbeted longitudinal apertures 19B and 19D, respectively, and glass and steel plates 19C and 19E, respectively, are secured therein. If desired, this plate may be glass on both sides, or if preferred, it may be a glass plate on one side and a steel plate on the other. These plates may be secured in these apertures by any suitable means. If glass is used, it will enable the action of the jets to be watched and adjusted, if desired, by the operator.

The object of using a steel plate is to obtain a material there hard enough to withstand the wear of the outward flowing mineral particles through the discharge apertures. Water jet discharging nozzles 20, are placed on the apron, and are arranged to deliver jets of water up into the apertures 18, preferably slightly upward against the stream of ore pulp flowing through the launder. These nozzles 20 are connected to lengths of hose 21, that lead to a supply of water under pressure, and their water discharging ends are preferably flattened to deliver a flat stream. These nozzles and the hose for each may be secured in operative relation to the discharge apertures of the launder by any suitable means. I preferably, however, support each by a bracket 22, which is shown broken away in Fig. 2, one end of which is secured to the adjacent side of the launder, and the opposite end is provided with a clamp 23, that is secured to the hose 21. These concentrates discharging apertures are provided with gates 24, by which they may be adjustably opened or be closed when desired. These gates may be of any suitable form, preferably, however, I use a plate, which is pivotally secured by a bolt 26 at one corner to the adjacent side of the launder, and which is adapted to be swung up and down to open or close the apertures as desired.

My improved ore concentrating launder is adapted to be suspended at its opposite ends by rods 32 from timber frames 33, which are placed at its opposite ends, the rods 32 being connected at one of their ends to eye bolts 34, that are secured to the inside of the timbers, and also to eye bolts 34A at their opposite ends that are attached to the tops of the opposite sides of the launder. The head end of the launder is also provided with a bumping mechanism, which is adapted to impart intermittent reciprocating blows against the end of the launder, that act to quickly settle the mineral particles out of the ore pulp to the bottom of the launder. This bumping mechanism comprises a vertical frame 36, that is pivotally supported at its lower end to floor sills 37, by a bolt 38, and at its upper end is provided with a hammer or bumping head 39, of metal or other suitable material, which is arranged to strike against a buffer plate 40, of metal or other suitable material, which is secured to the end of the launder.

The bumper head is actuated on the backward stroke of its reciprocal movement by a cam 41, which is mounted on a shaft 42, that extends across the end of the launder supporting frame 33, and is mounted in bearings 43, that are secured to the frame 33. The cam rotates against a plate 43A, that is secured to the frame 36. A pulley 44, is secured on the shaft, and is adapted to be connected by belt to a source of rotative power, by which the shaft and cam are rotated, to move the bumper frame and bumper on its backward stroke, and the bumper frame and bumper are thrown forward to strike or bump against the launder by a contracting tension spring 45, which is preferably a coiled spring. This spring is connected at one end to the bumper frame intermediate of its cam engaging part and its pivoted end, by a pin 46, that extends through the bumper frame 36, and its opposite end is secured to the end of a bracket 47, that is secured to the frame.

The launder is provided at intervals along its length with slimes catching devices, which consist of pieces of carpet or other suitable fabric 48, which are arranged to depend from a rod 49, that is vertically adjustable in brackets 50, that are secured to the opposite sides of the inside of the launder (see Fig. 4). The brackets are provided with several open-sided apertures 51, which are arranged to register opposite to each other and the rod is vertically adjustable in them by being moved from one opposite pair of apertures to another opposite pair of apertures in the brackets. The carpet is arranged to depend into the ore pulp, and as the ore pulp flows along the launder the floating material called slimes flows in contact with the carpet and is caught and retained by it, and as this floating slimes material carries values, it is caught and saved by the carpets. The carpets are removed from time to time, and thrown into tanks of water, which I do not illustrate.

The operation of my improved ore concentrating launder is as follows: Ore pulp is fed from a source of supply into the launder through the ore chute 4, and flows in a continuous stream through the launder and out of its rear end, which is open and allows the tailings to run to waste, or they may be run into another similar launder for retreatment, and then run to waste. As the ore pulp flows through the launder, the

mineral particles therein settle down into the V-shaped bottom of the launder and are mixed with some of the heavier particles of gangue rock that settle with them, the jets of water are turned on and are adjusted to give, by the force of the water flowing into the ore pulp (which is a flowing stream of crushed, ground or pulverized ore rock, mixed with enough water to form a flowing stream), a bubbling up current of water in the ore pulp, that raises the mineral particles from the bottom of the launder and allows the lighter gangue particles among the mineral particles to be separated from the mineral particles and carried off with the flowing ore pulp, while the clean mineral particles settle down as concentrates and flow out of the discharge aperture around the jet valve 9, and through gated apertures 18 in the bottom of the launder. The remaining part of the ore pulp, which is called tailings, discharges from the open discharge end of the launder.

While I have illustrated my improved launder with two different arrangements of ore concentrates discharging apertures and water jet inlet nozles, I do not wish to be limited to the constructions and arrangements shown, as my invention contemplates the application to a launder of any suitable ore concentrates discharging outlets and water inlet nozzle arranged to produce an upward current of clear water from the bottom of the launder into the ore pulp.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an ore concentrating launder, the combination in a launder having a discharge aperture of a pipe fitting, extending into said aperture and depending from the bottom of said launder, and having an angular discharge portion below its connection with said launder, said fitting being provided with an outwardly flaring inlet edge, a water discharging nozzle within said launder provided with an outwardly beveled head, threaded to the inside of the outer end portion of said pipe, said threaded end being arranged to permit its head end portion to be adjusted toward the flaring inlet end of said pipe fitting, a threaded outer end to said nozzle, a valve connected to said threaded end, and a hose connected to said valve and arranged to lead to a supply of water under pressure.

2. The combination with an ore concentrating launder, of riffles consisting of rows of nails projecting from opposite sides of the interior of the launder adjacent to its bottom.

3. The combination with a V-shaped launder, of riffles consisting of rows of nails extending from opposite sides of the interior of the launder adjacent to its bottom, the rows on one side being arranged to overlap those on the other side.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP R. STANHOPE.

Witnesses:
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