No. 648,458. Patented May 1, 1900.

C. GALVAN.

CONCENTRATOR.

(Application filed May 16, 1899.)

(No Model.) 2 Sheets—Sheet 1.

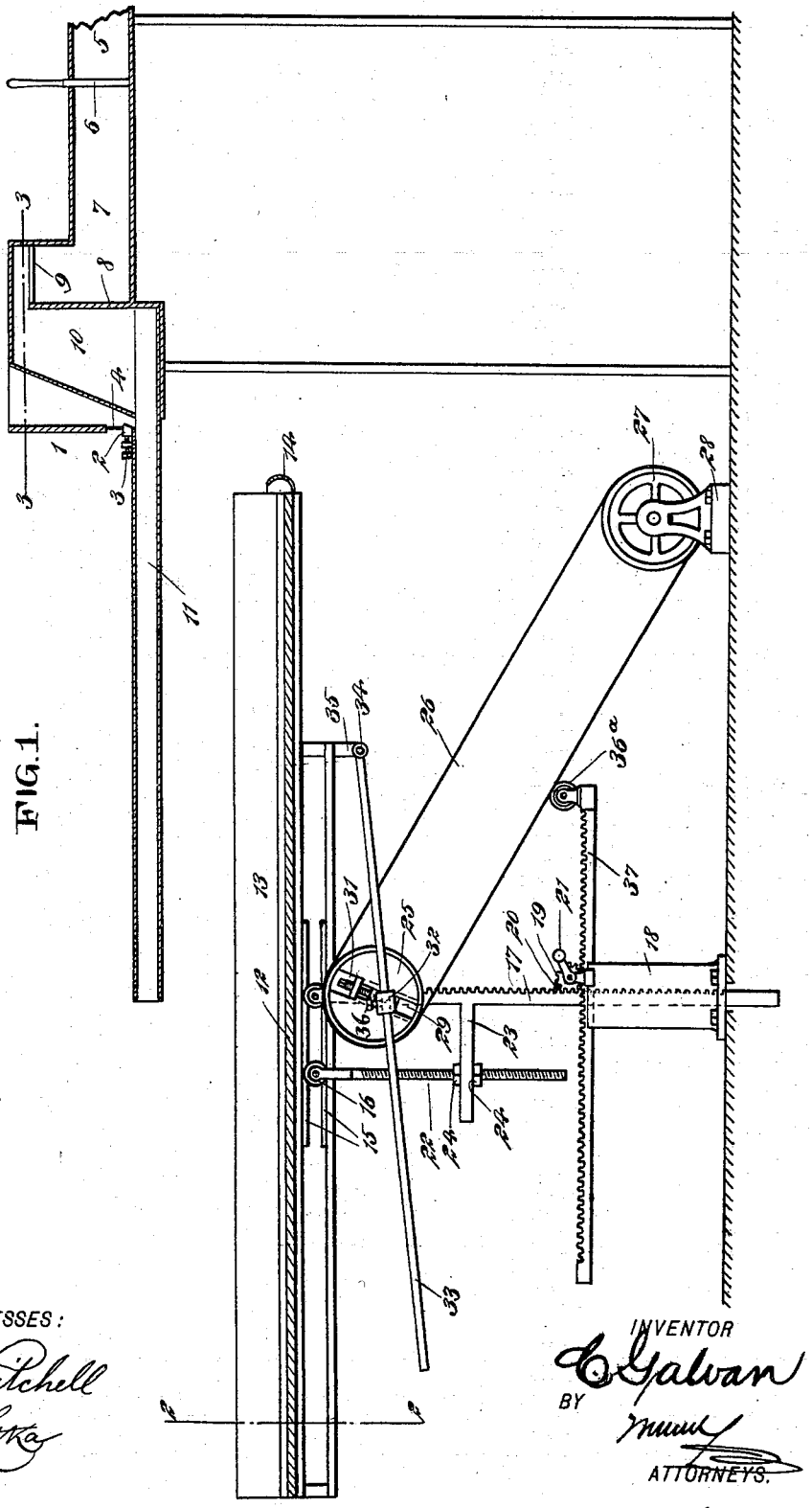

FIG. 1.

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FIG.2.

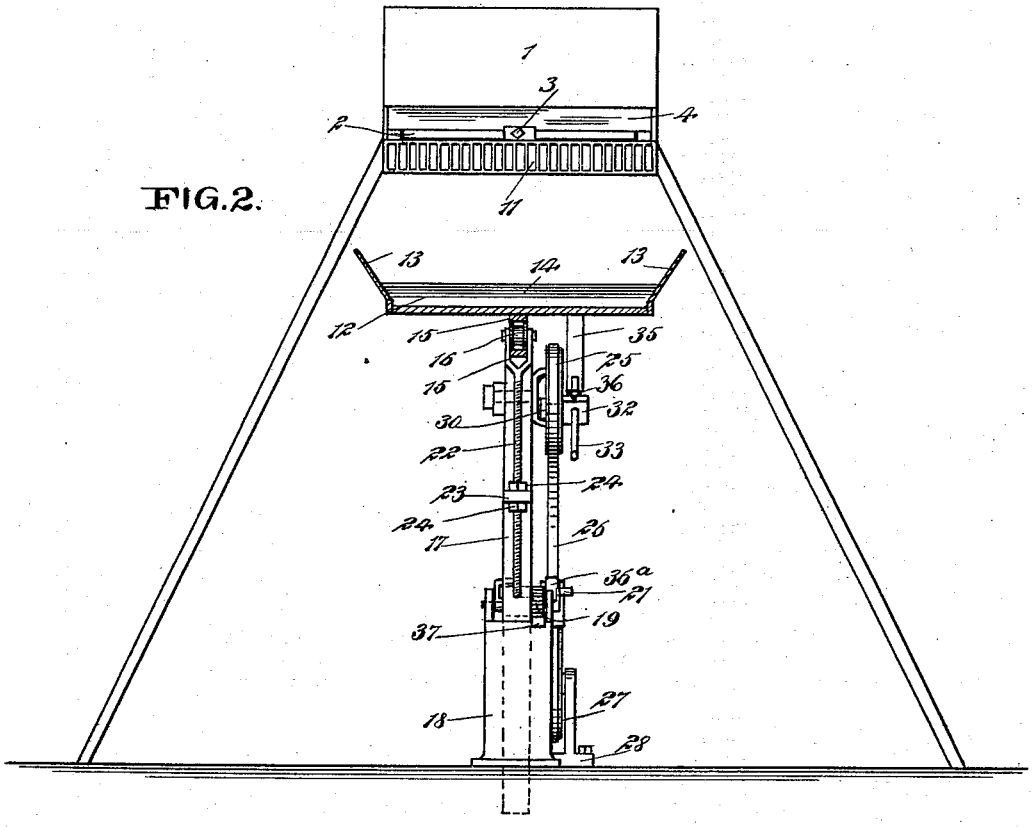


FIG.3.

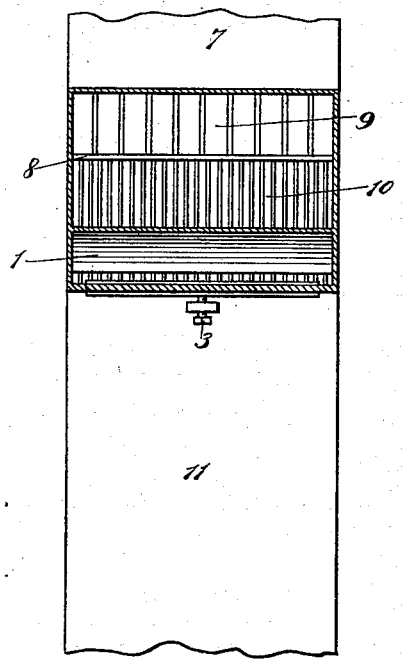


FIG.4.

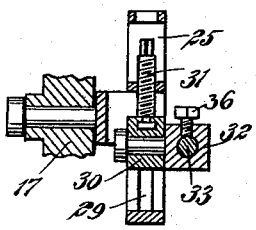
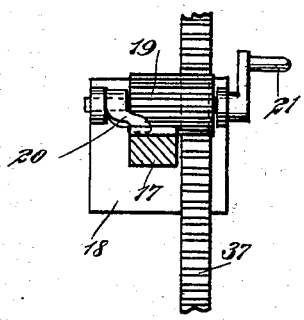


FIG.5.



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UNITED STATES PATENT OFFICE.

CLEOFAS GALVAN, OF ZACATECAS, MEXICO.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 648,458, dated May 1, 1900.

Application filed May 16, 1899. Serial No. 716,986. (No model.)

To all whom it may concern:

Be it known that I, CLEOFAS GALVAN, a citizen of Mexico, residing at Zacatecas, in the State of Zacatecas and Republic of Mexico, have invented new and useful Improvements in Concentrators, of which the following is a full, clear, and exact description.

My invention relates to machines for concentrating ores and other substances, and has for its object to provide a comparatively-simple and readily-adjustable machine for the above-indicated purpose.

The invention will be fully described hereinafter and the features of novelty pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of the improved concentrator. Fig. 2 is a cross-section thereof on the line 2 2 of Fig. 1. Fig. 3 is a detail sectional plan on the line 3 3 of Fig. 1. Fig. 4 is a detail sectional view of an eccentric forming part of my machine and the mechanism connected therewith; and Fig. 5 is an enlarged elevation, with parts in section, of the means for adjusting the concentrating-table vertically.

The improved ore-concentrator consists of two principal parts—viz., a stationary separator, in which the material is subjected to the action of a blast, and a vibrating concentrator-table.

The apparatus is provided with a hopper 1 for receiving the ore or other material to be concentrated. The hopper tapers toward its lower end and is provided thereat with a valve 2, adjustable by means of a screw 3 to vary the size of the outlet, and consequently the amount of feed. A glass pane 4 permits of watching the feed.

5 designates an air-supply channel connected with a blower or any other apparatus for producing a blast. The supply of air may be regulated by means of the gate or valve 6. The air passes into a chamber 7 and against a deflector 8, which throws it upward against the horizontal gauze or perforated partition 9, whereby the air is divided into a number of streams. These streams pass into the chamber 10, located in the rear of the hopper 1, and then into a series of narrow channels 11, extending forwardly under the outlet of the hopper in a substantially-horizontal direction. The channels terminate at a point located approximately over the center of the concentrator-table.

The concentrator-table 12 is provided at its sides with inclined flanges 13 and at one end with a channel 14 to receive the concentrates. The table has spaced tracks 15, adapted to receive between them rollers 16. One of these rollers is carried directly by a rack 17, which is vertically adjustable in a suitable post 18 by means of a pinion 19, a pawl 20 serving to hold the rack in position after adjustment. 21 is a crank for turning the pinion 19. The other roller 16 is carried by a rod 22, which is vertically adjustable upon an arm 23, extending from the rack 17. The adjustment may be effected, as shown, by means of nuts 24, screwing on the rod 22 and engaging the arm 23 on each side, while the rod passes through said arm loosely. It will be understood that by raising the rod 22 more or less the concentrator-table 12 may be inclined more or less toward the concentrates-channel 14. The rack 17 carries a bearing for a pulley 25, which is driven by means of a belt 26 from the pulley 27, journaled in a stationary bearing 28. The pulley 25 is provided with an axial guideway 29, in which is adapted to slide a block 30, adjustable in said guideway by means of a screw 31, which also turns in a relatively-stationary part of the pulley. To the block 30 is swiveled a sleeve 32, through which passes a rod 33, pivoted at 34 to a lug 35 on the concentrator-table 12. A set-screw 36 is used for fastening the rod 33 in the sleeve 32 after adjustment. It will be understood that the rotation of the pulley 25 will cause the concentrator-table to reciprocate on the rollers 16, the stroke or extent of the reciprocating movement being governed by the greater or smaller eccentricity of the sleeve 32.

It will be obvious that when the concentrator-table 12 is lowered by the rack 17 the belt 26 will become slack, and to remedy this I provide a tension-roller 36^a, positively connected with the mechanism for raising and lowering the table, so that the roller will be pressed against the belt or withdrawn there-

from to preserve a uniform tension of the belt. As shown, the tension-roller is mounted at the end of a rack 37, slidable horizontally in the post 18 and engaged by the pinion 19, the same being wide enough to engage both the rack 17 and the rack 37. Obviously, however, two separate pinions might be employed, and in this case the two racks would not need to have teeth of the same size.

The operation of the machine will be readily understood. The ore issuing from the hopper is subjected to the action of the air-blast, which throws the lightest particles of material far enough to clear the concentrator-table, and the blast, instead of being an unbroken stream or current, consists of a series of jets, which act much more thoroughly to separate and grade the material. That portion of the material which falls upon the table 12 is subjected to a separating action by the vibrating motion of the table, the lighter particles being thrown off, while the concentrates are collected in the channel 14. It will be understood that the action can be accelerated or retarded by inclining the table more or less by the means hereinbefore described. Also the proportion of material reaching the table can be altered by varying the distance between the outlet of the blast apparatus and the table. In all positions of the table, however, the tension of the driving-belt will be kept constant.

I desire it to be understood that I do not restrict myself to the exact construction shown in the drawings, but modifications, as long as they are within the scope of the appended claims, will constitute no departure from the nature of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A concentrator having an ore-feed device, a concentrating-table, a table-supporting frame adjustable vertically toward and from said ore-feed device, a pulley on said frame, means for vibrating the table by the rotation of the pulley, a driving-pulley journaled in stationary bearings, a belt connecting the driving-pulley with the pulley on the frame, a tension-pulley for said belt, and an adjusting device for said tension-pulley, operated by the adjusting movement of the table-supporting frame.

2. A concentrator comprising a stationary separator or grader having an inlet and an outlet, a concentrator-table adjustable toward and from said outlet, driving mechanism adjustable with the said table for imparting a vibratory motion thereto, a stationary driving-pulley, a belt connecting said pulley with another forming part of the above-named driving mechanism, and a tension device engaging the belt and operatively connected with the table-adjusting devices.

3. A concentrator comprising a stationary separator or grader having an inlet and an outlet, a concentrator-table, a vertical rack carrying said table and movable toward and from the outlet of the blast-channel, a driving mechanism adjustable with the rack for imparting a vibratory motion to the table, a stationary driving-pulley, a belt connecting it with another pulley forming part of said driving mechanism, a tension-roller engaging the belt, an approximately-horizontal rack carrying the tension-roller, and an adjusting-pinion engaging both racks.

4. A separator or grader comprising a hopper, an air-chamber adjacent to the hopper, a vertical deflector at the end of said chamber, a horizontal perforated partition adjacent to the deflector, and a series of blast-channels located below the outlet of the hopper and extending forwardly therefrom.

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