No. 845,395

PATENTED FEB. 26, 1907.

M. CHRISTMANN.

ORE CLASSIFIER AND FEEDER.

APPLICATION FILED OCT. 24, 1905.

2 SHEETS—SHEET 1.

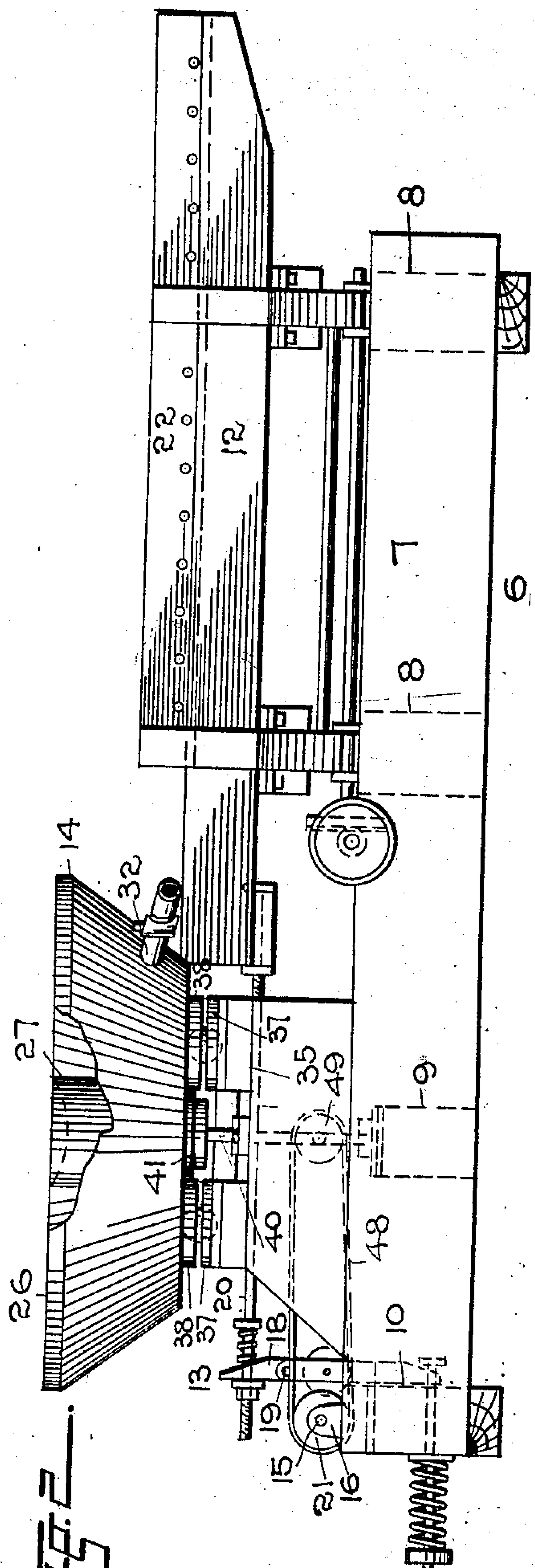

Fig. 2

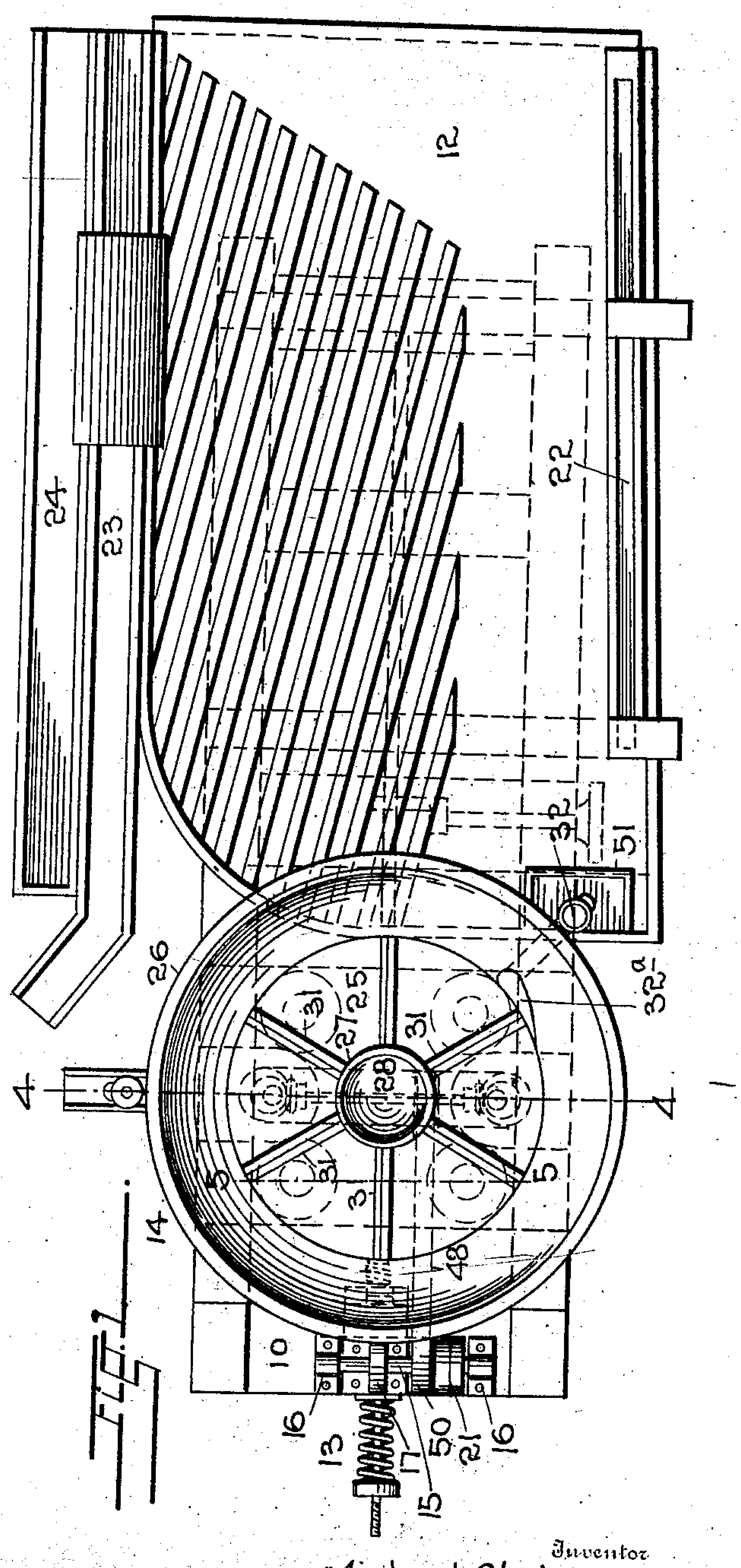

Fig. 1

Witness

Inventor

Michael Christmann

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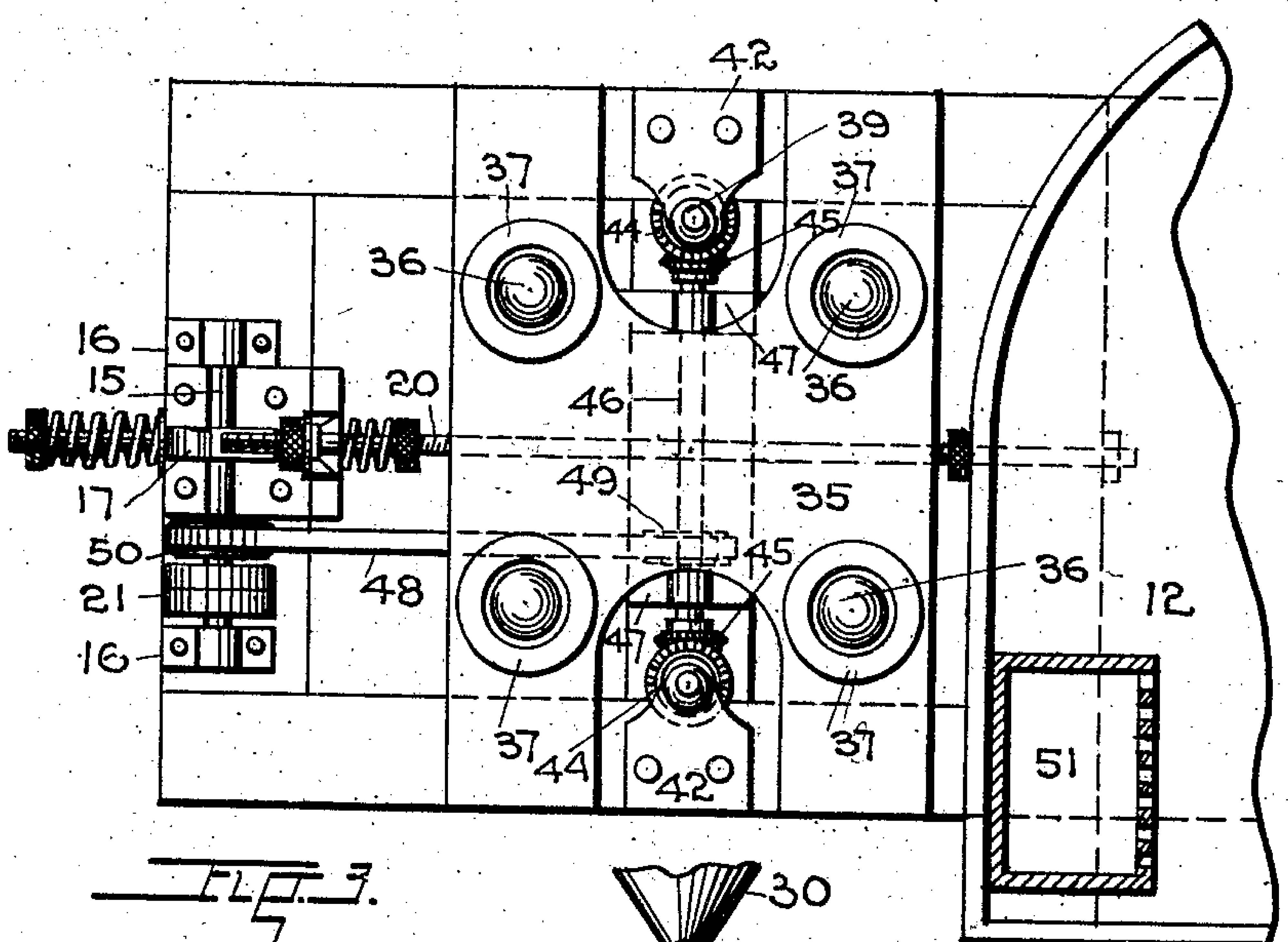

Fig. 3.

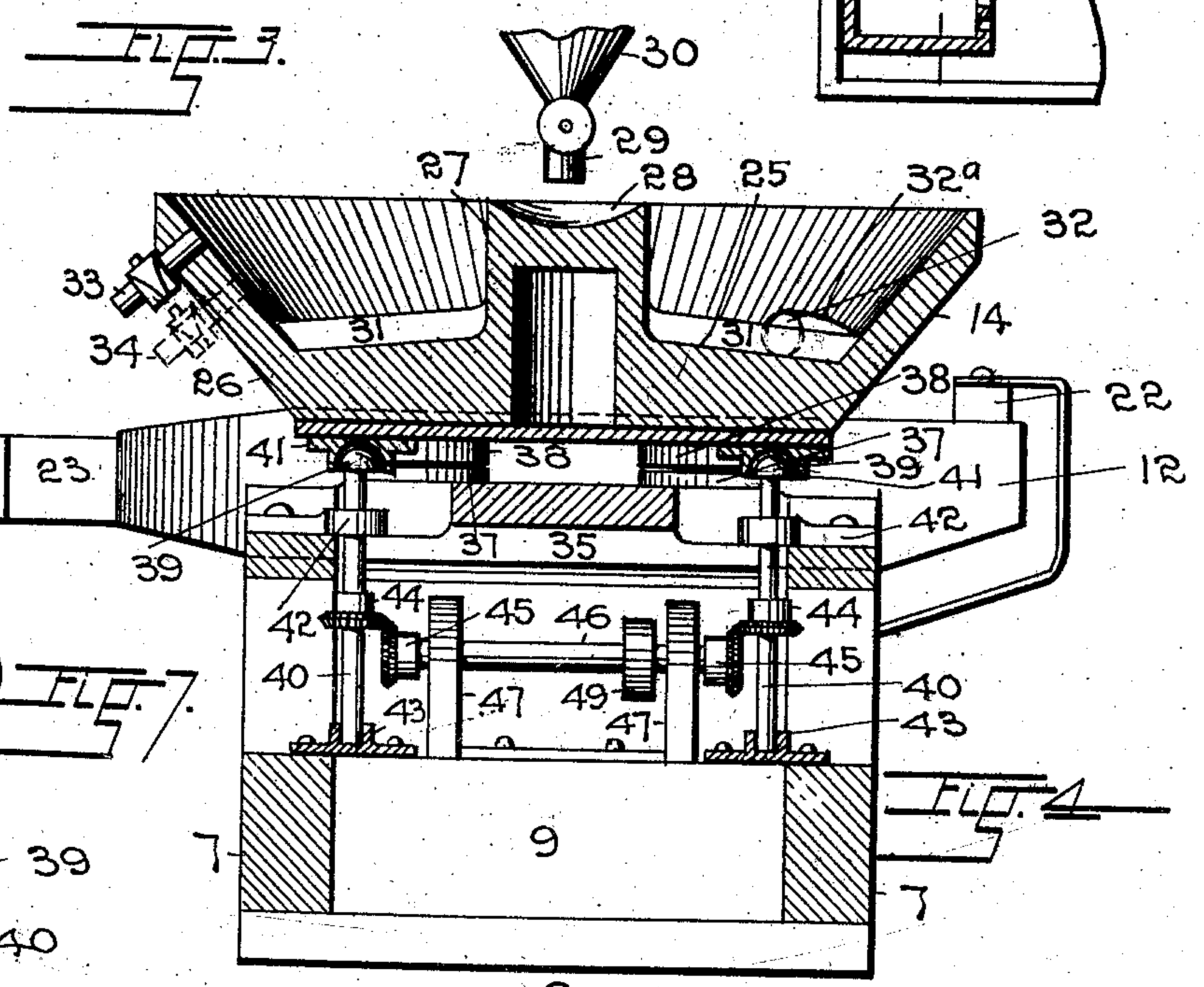

Fig. 4.

Fig. 7.

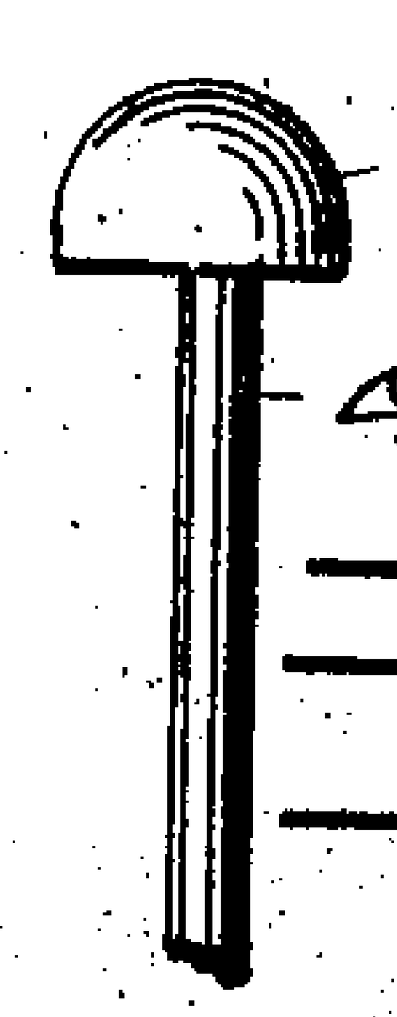

Fig. 6.

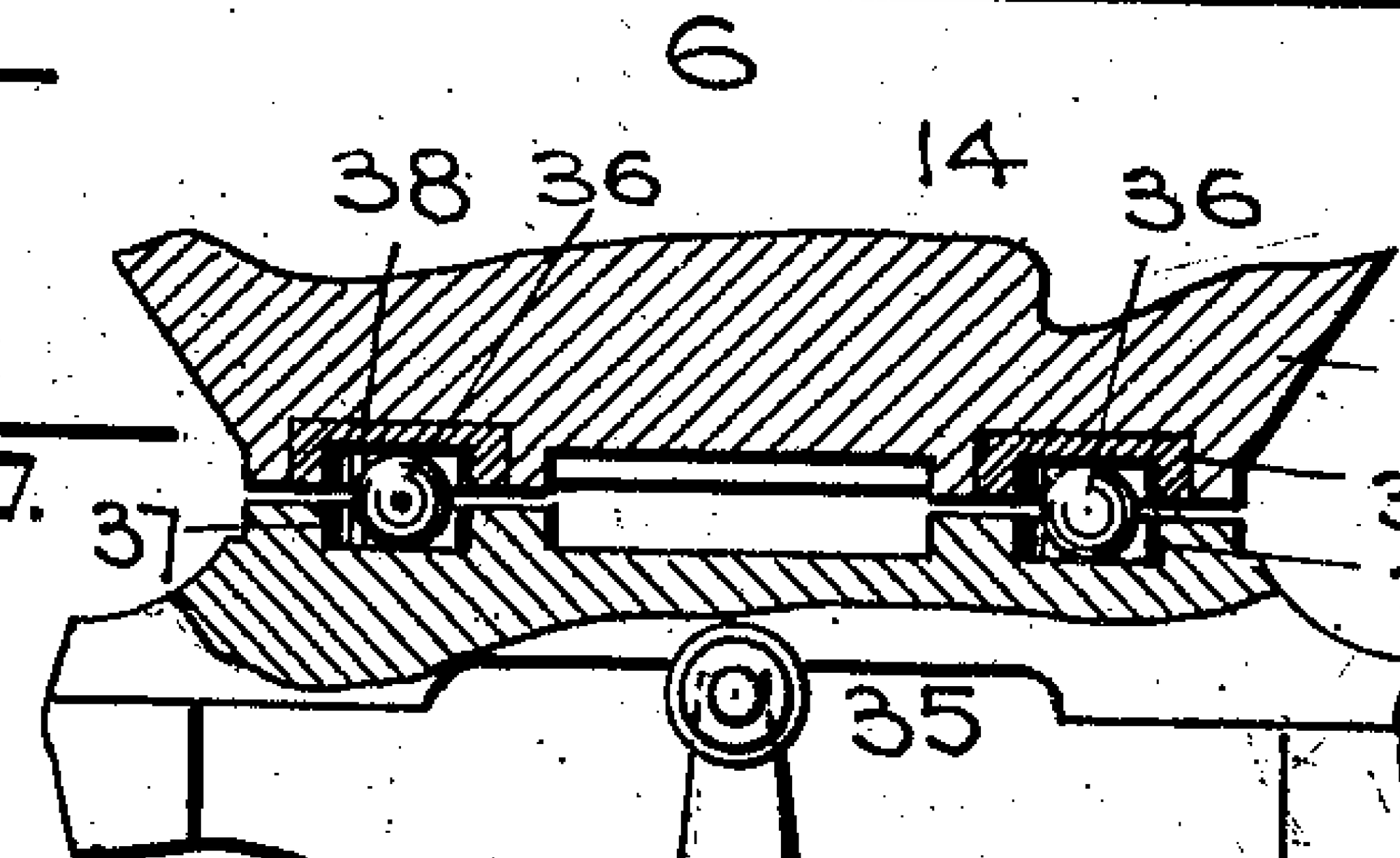

Fig. 5.

Witness

K. M. Cam

K. M. Stump.

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UNITED STATES PATENT OFFICE.

MICHAEL CHRISTMANN, OF LEADVILLE, COLORADO.

ORE CLASSIFIER AND FEEDER.

No. 845,395. Specification of Letters Patent. Patented Feb. 26, 1907.

Application filed October 24, 1905. Serial No. 284,193.

To all whom it may concern:

Be it known that I, MICHAEL CHRISTMANN, a citizen of the United States of America, residing at Leadville, in the county of Lake and State of Colorado, have invented certain new and useful Improvements in Ore Classifiers and Feeders, of which the following is a specification.

This invention, which pertains to improvements in ore classifiers and feeders, has for its object to provide an apparatus which, being simple in construction and operation, will effectively classify the pulp and separately discharge the various sizes of ore.

My device is particularly adapted to be used in connection and coöperation with ore-concentrator tables and similar appliances.

I attain my objects by the mechanism illustrated in the accompanying drawings, in which my apparatus has been shown in connection with a concentrator-table of the type illustrated and described in my application for patent, Serial No. 264,154, filed by me in the United States Patent Office June 7, 1905.

In the drawings, in the various views of which like parts have been similarly designated, Figure 1 represents a plan view of my device mounted on and operatively connected with a concentrator-table of the type named; Fig. 2, a side elevation thereof; Fig. 3, an enlarged fragmentary view of the "movement end" of the stationary frame; Fig. 4, an enlarged vertical section taken along a line 4 4, Fig. 1; Fig. 5, a fragmentary section taken along the line 5 5, Fig. 1, and Figs. 6 and 7, respectively, plan and elevation of the eccentric.

Referring to the drawings, 6 represents a bed or base frame consisting of the longitudinal beams 7 and 7 and cross-timbers 8, 9, and 10, securely bolted together to form an adequate support for the reciprocating concentrator-table 12 and its operating mechanism 13.

Frame 6 has been extended at the feed end of the table to accommodate my improved classifier and feeder 14, which in this instance is located between the head end of the table 12 and the operating mechanism 13. The latter consists of a transverse shaft 15, mounted in boxes 16 at the extreme end of the frame and carrying a wiper-wheel 17, which engages a lever 18, fulcrumed at 19 and connected with the table by a draw or thrust rod 20. Shaft 15 may receive its rotary motion from any convenient source of power by means of pulleys 21. An apertured water-trough 22 supplies water onto the riffled table-deck, while launders 23 and 24, located at the lower or discharge side of the table, convey the gangue and silica discharged therefrom into convenient receptacles.

My device consists of a pan 14, composed of a bottom 25, having a slightly cone-shaped upper surface and a surrounding outwardly-flaring peripheral side or rim 26. Pan 14 is provided with a preferably integral centrally-located upwardly-extending cylindrical projection or core 27, the upper surface 28 of which, being concave, forms a shallow receptacle to receive the pulp discharged therein from a superposed receptacle 30 through a valve-controlled spout 29. A number of equidistant radially-extending, preferably inverted-V-shaped riffles 31 connect core 27 with the surrounding side 26. Pan 14 is furthermore provided with two valve-controlled discharge-spouts 32 and 33, the lower one, 32, of which, being located near the bottom, transmits the heavy and valuable particles contained in the pulp, while the other, 33, located near the upper edge of the pan, is purported to discharge the lighter matter or gangue.

It should be understood that although but two discharge-spouts have been shown in the drawings their number may be increased to obtain intermediate sizes of ore by interposing one or more additional outlets between the upper and lower ones, as shown at 34, Fig. 4. The number as well as the location of the intermediate discharge-spouts will naturally vary with the nature and fineness of the ore to be classified to facilitate the discharge of the particles of ore from the bottom surface of the pan through spout 32. A short channel 32^a, cut in the inner surface of side 26, leads from said surface into the outlet in the direction in which the pan rotates.

Pan 14 is supported above an elevated platform 35, secured on beams 7 and 7 of the stationary frame by means of antifriction-balls 36, interposed between oppositely-disposed sockets 37 and 38, respectively, secured upon platform 35 and to the under surface of bottom 25 of the pan. Sockets 37 and 38 are diametrically larger than balls 36 to permit a horizontal eccentric motion of pan 14. This movement is imparted to

the pan through instrumentality of two semi-spherically-shaped eccentrics 39, secured at the upper extremities of vertically-mounted shafts 40 and extending into correspondingly-shaped sockets 41, diametrically oppositely secured to the under surface of pan 14. Shafts 40 are revolubly mounted in journals 42, secured to platform 35, and in step-boxes 43, placed upon the cross-timber 9 of the stationary frame. They receive their rotary motion through instrumentality of bevel gear-wheels 44, mounted on the shafts at points intermediate of their extremities and meshing into corresponding gear-wheels 45, secured on a horizontally-disposed shaft 46, which is revolubly mounted in journals 47, erected on the cross-timber 9, which connects beams 7 of the stationary frame. A rotary motion is imparted to shaft 46 from the main shaft 15 of the table-reciprocating mechanism by means of a belt 48, which passes around pulleys 49 and 50, respectively, mounted on shafts 46 and 15.

Having thus described the mechanical features of my apparatus, its operation is as follows: The pan being mounted on the platform at the head or feed end of the table, as described, extends above the latter a sufficient distance to permit the ore discharged through the lowermost outlet 32 to fall into a feed-box 51, mounted on the deck of table 12. Through instrumentality of the mechanism hereabove described a rapid eccentric motion closely resembling that of the ordinary miner's pan is imparted to pan 14 from shaft 15 simultaneously with the reciprocating movement imparted to the table. The pulp contained in receptacle 30 is now permitted to fall into the shallow concave receptacle 28 in core 27 by opening the valve in spout 29. The rapid eccentric movement of the pan will cause the pulp overflowing the edges of projection 27 to be fed evenly over the inner surface of the pan, thus separating and distributing the particles contained in the pulp and greatly increasing the efficiency of the device. Owing to the eccentric movement of the pan the heavy mineral-bearing and most valuable particles will settle at the bottom, momentarily held by the riffles, to subsequently pass through outlet 32 onto the table, while the lighter lesser values are held in suspension at elevations varying according to their specific gravity. The gangue being uppermost is discharged through the outlet 33, while the other values may be discharged through the intermediate spouts 34 and conveyed to other tables, settling-tanks, or kindred contrivances. In most cases, however, but two spouts are required to successfully operate my device, the upper one constantly removing the gangue, while the heavy mineral-bearing particles of the pulp gradually settle on the bottom to be conveyed through outlet 32 to the table in consecutive order, according to their gravity.

It will be understood that the classifier, if so desired, may be operated independent of the table and by any suitable operating mechanism.

Having thus described my invention, what I claim is—

1. An ore classifier and feeder comprising in combination, a stationary support, a pan movably mounted thereon and including a central core having a concave upper surface, and a concentric wall, spaced therefrom and having a plurality of discharge-openings at varying elevations from the bottom of the pan, and means to impart a gyratory movement to the pan.

2. An ore classifier and feeder comprising in combination, a stationary support, a pan movably mounted thereon, and including a central core having a concave upper surface and a wall concentrically spaced therefrom and having a discharge-opening level with the bottom of the pan and a discharge-opening elevated therefrom, and means to impart a gyratory movement to the pan.

3. An ore classifier and feeder comprising in combination with a stationary frame, a pan movably mounted thereon and having a conical floor, a central, cylindrical projection having a concave surface adapted to receive and distribute pulp fed on its upper surface, the said pan having peripheral discharge-openings at varying elevations from the said floor.

4. An ore classifier and feeder comprising in combination with a stationary frame, a pan movably mounted thereon and having a conical floor and inverted-V-shaped riffles extending radially along said floor, means to feed pulp into the said pan means to discharge the same at its periphery at different elevations from the said floor, and means to impart a gyratory movement to the pan.

5. An ore classifier and feeder comprising in combination with a stationary frame, a pan movably mounted thereon and having a conical floor, a central cylindrical projection having a concave surface adapted to receive and distribute pulp fed upon its upper surface, riffles extending radially from the said projection along the said floor, discharge means in its peripheral surface at varying elevations from its floor, and means to impart a gyratory movement to the pan.

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

MICHAEL CHRISTMANN.

Witnesses:
GEO. M. M. BOWEN,
WILLIAM H. NASH.