

B. JACQUART & J. V. V. BOORAEM.

CLAY CLEANING MACHINE.

APPLICATION FILED DEC. 22, 1910.

1,024,262.

Patented Apr. 23, 1912.

6 SHEETS—SHEET 1.

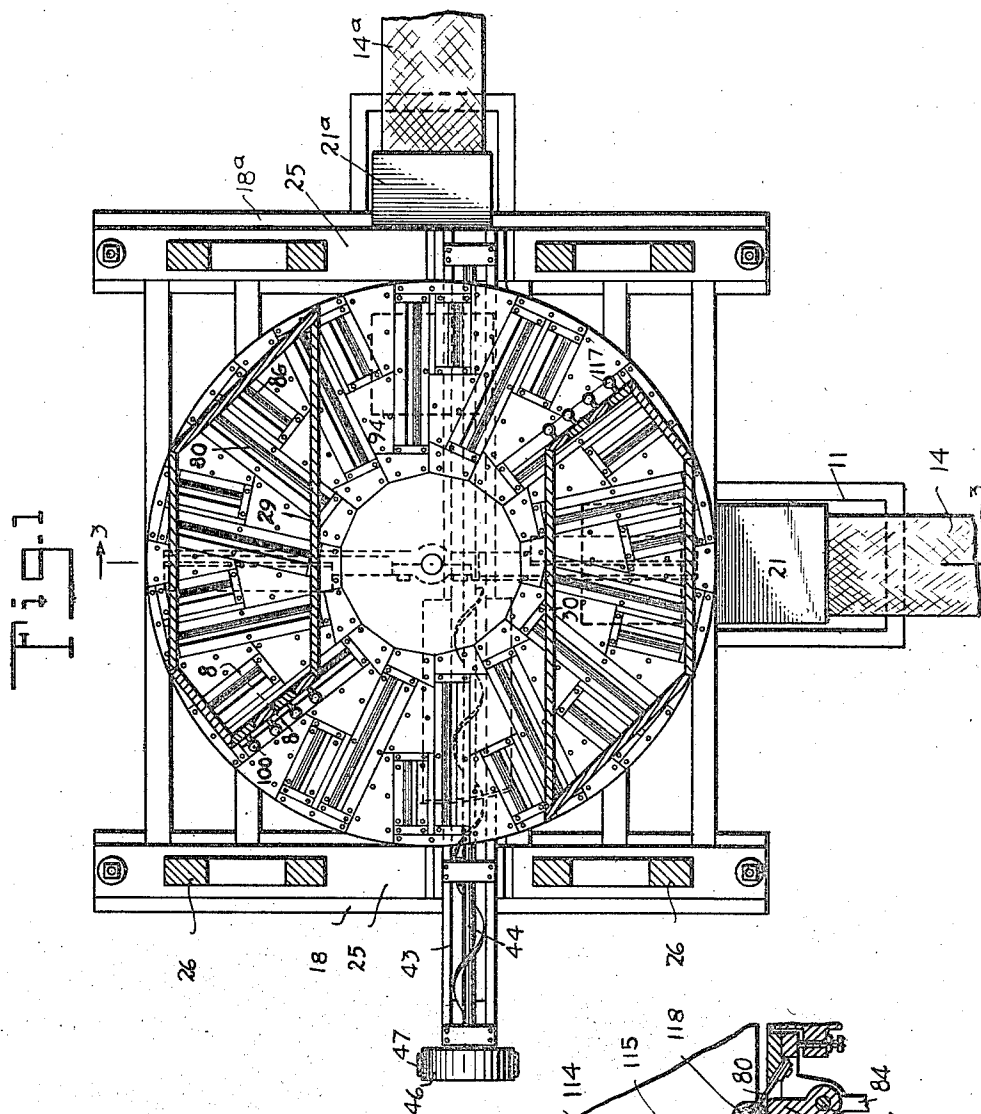


Fig. 1

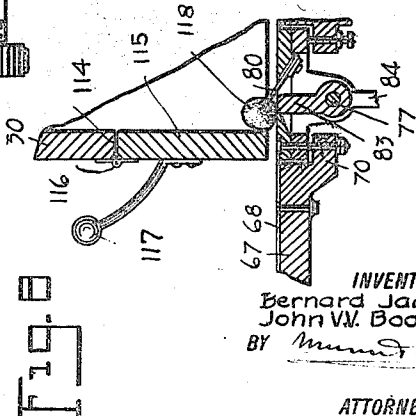


Fig. 2

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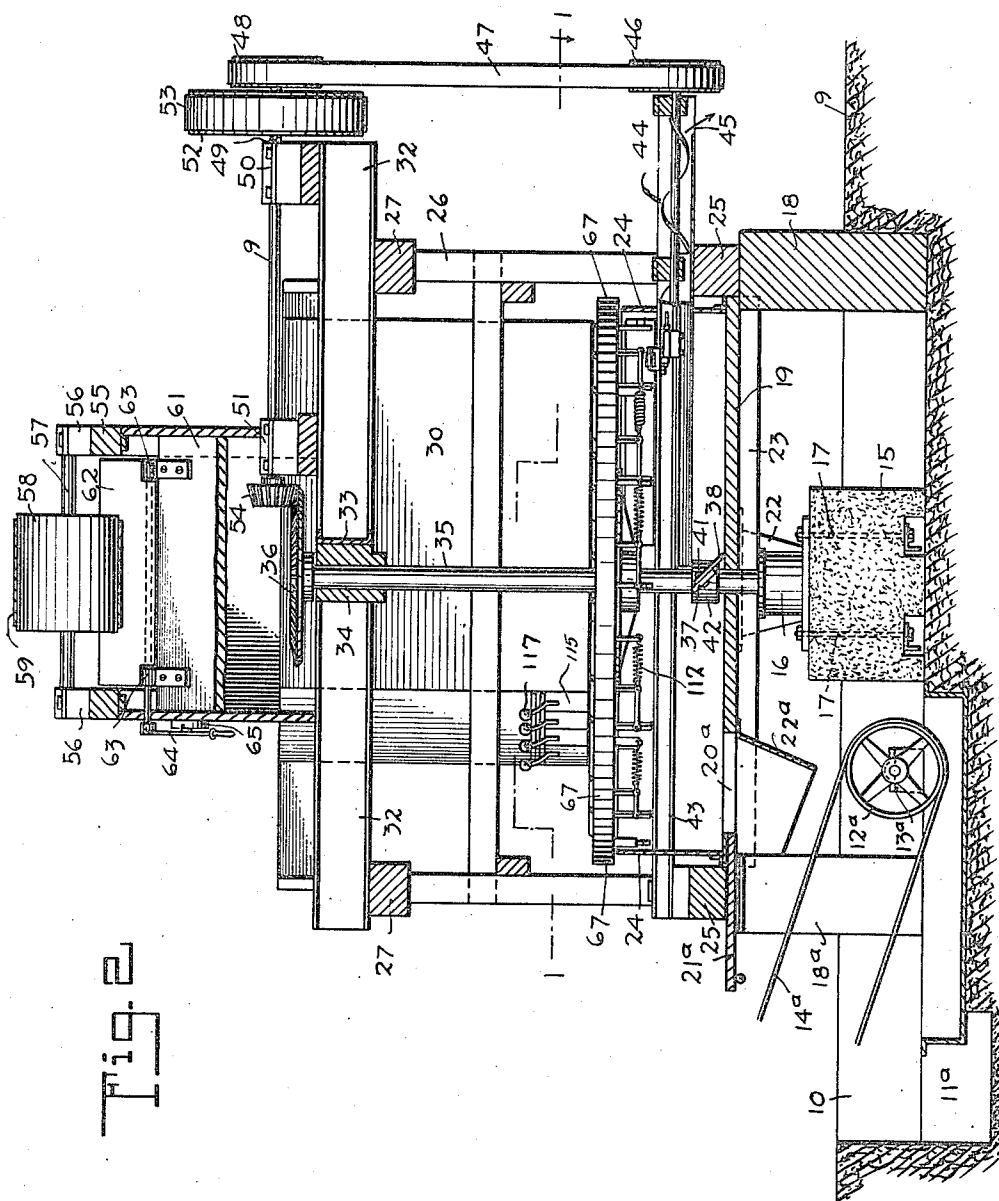


Fig. 2

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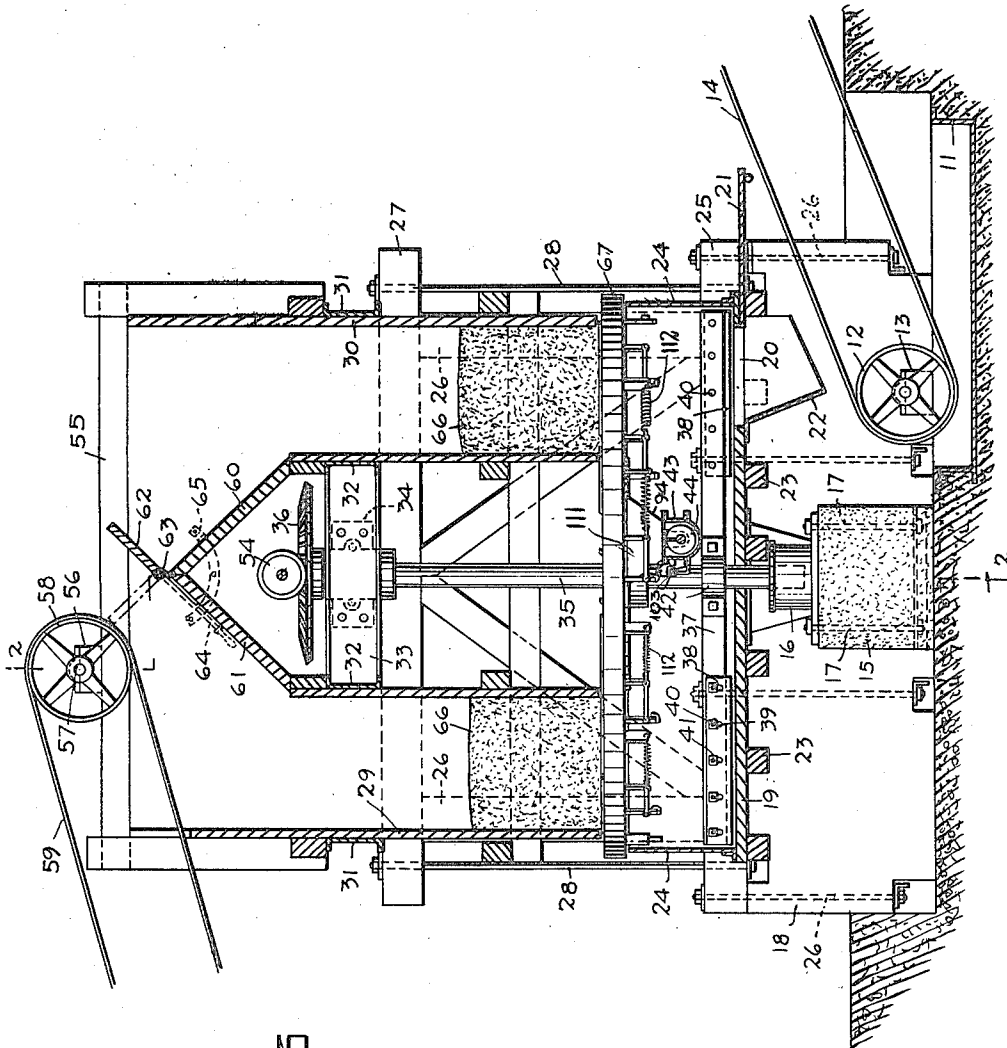


Fig. 3

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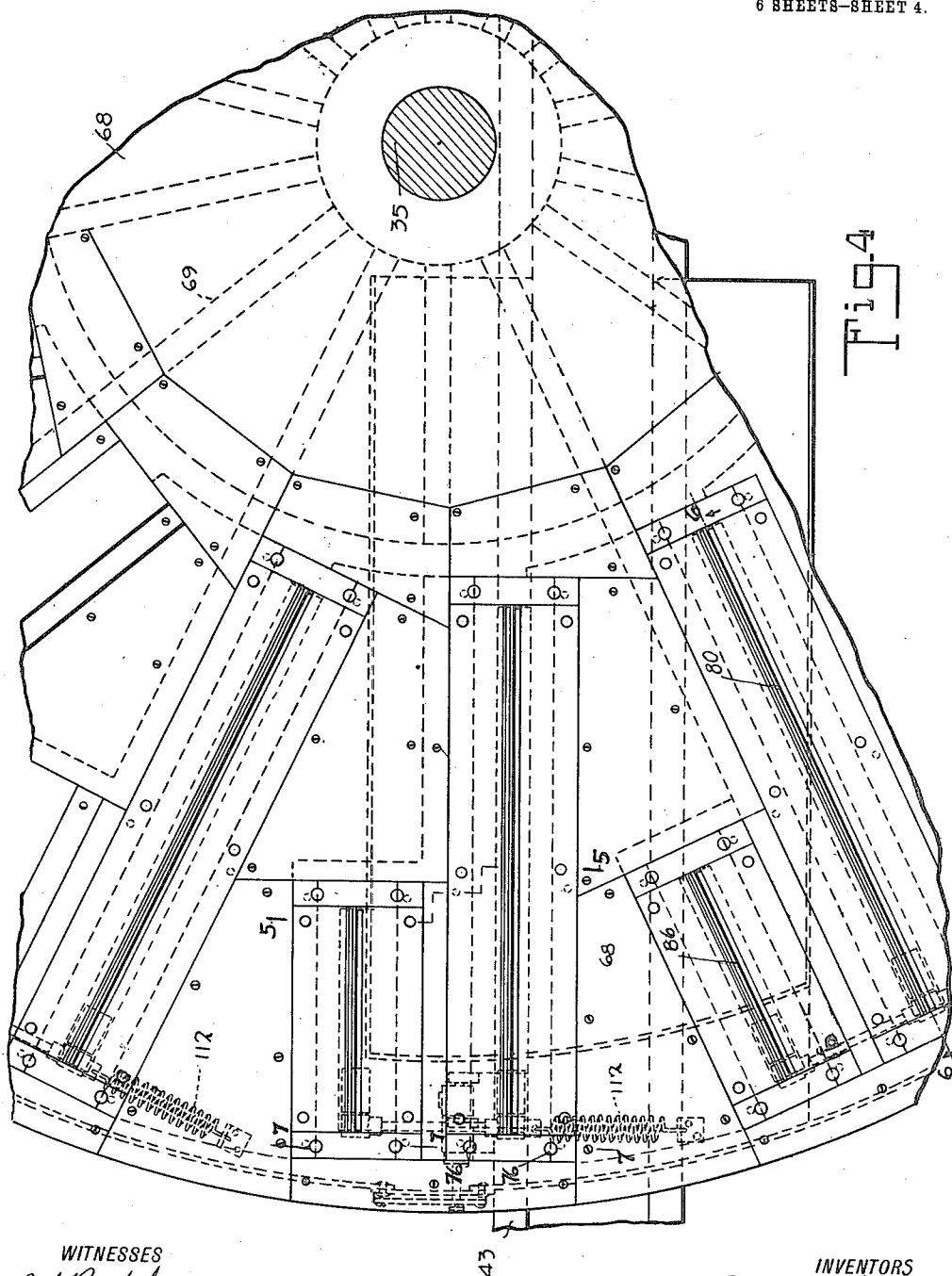
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6 SHEETS—SHEET 4.

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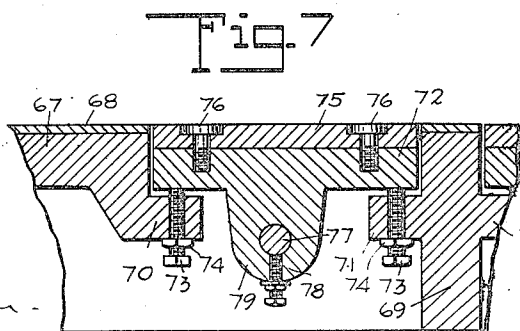
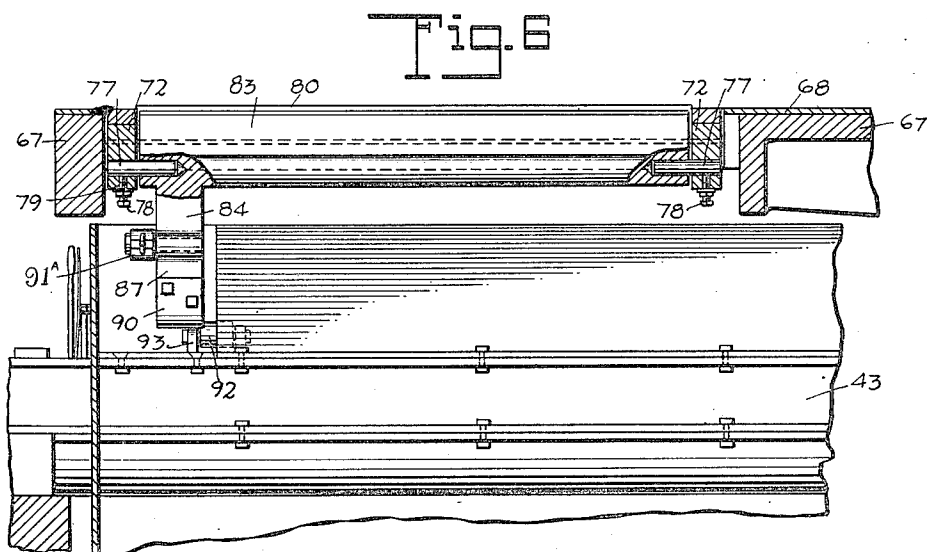
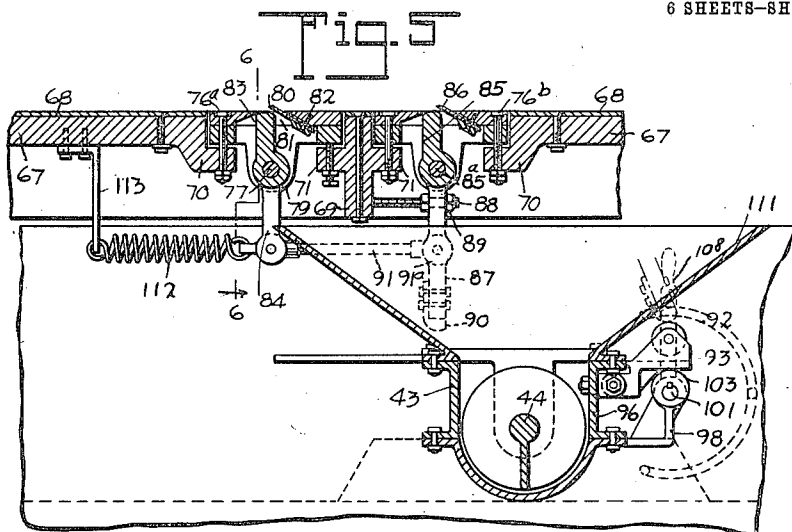
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6 SHEETS—SHEET 5.



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6 SHEETS-SHEET 6.

Fig. 11

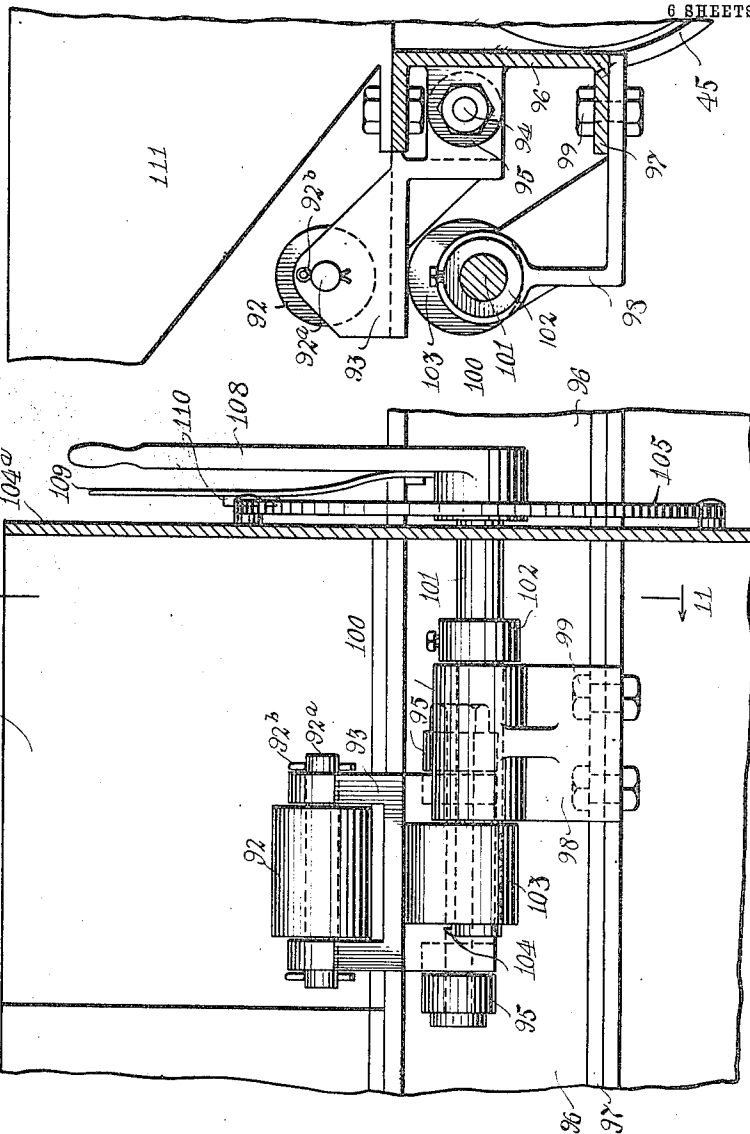


Fig. 10

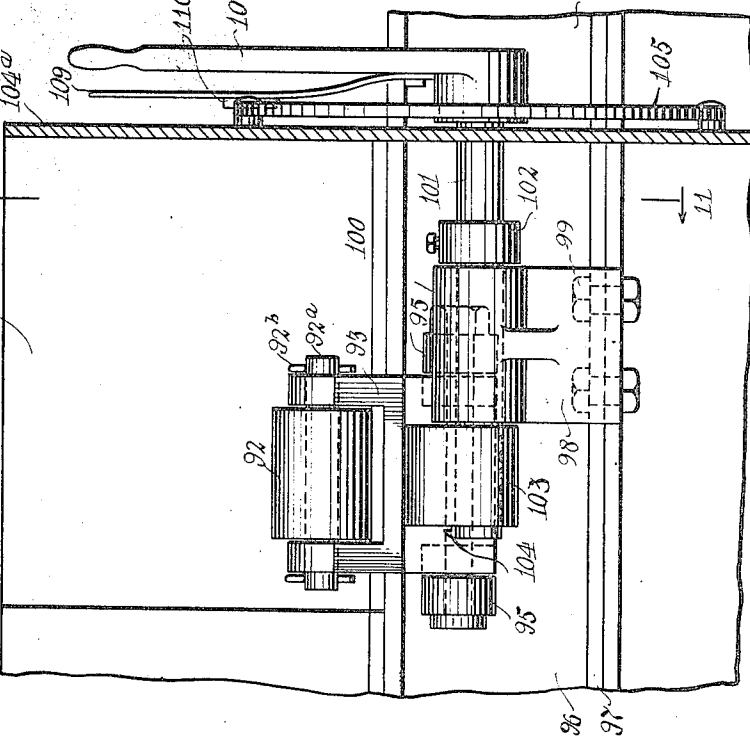
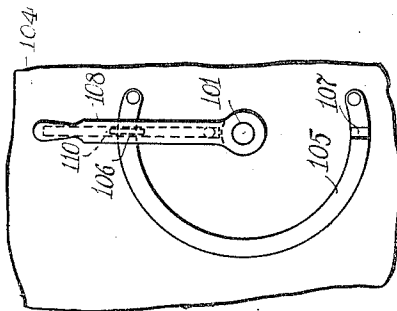


Fig. 9



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UNITED STATES PATENT OFFICE.

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CLAY-CLEANING MACHINE.

1,024,262.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed December 22, 1910. Serial No. 598,676.

To all whom it may concern:

Be it known that we, BERNARD JACQUART and JOHN V. V. BOORAEM, both citizens of the United States, and residents, respectively, of South River, in the county of Middlesex and State of New Jersey, and the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Clay-Cleaning Machine, of which the following is a full, clear, and exact description.

Our invention relates to clay cleaning machines—that is, to machines employed for separating pebbles, small stones and various other hard impurities from large masses of mined clay, in order to render the clay plastic and otherwise suitable for forming bricks, earthenware members, and other articles of the kind.

Our machine is of the general type which cuts away the soft plastic or semi-liquid parts of the clay, leaving the pebbles or other impurities or masses of the same in convenient form to be removed as waste matter.

Our invention further comprehends improved devices for taking care of the pebbles and other impurities as the same are separated from the clay so as to render the removal as little troublesome as possible, and also to render it as nearly as practicable continuous and automatic.

Our clay cleaning machine is in some respects more or less similar to that described in our pending application, Serial No. 536,537, for a clay cleaner, filed January 5, 1910.

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 horizontal section on the line 1—1 of Fig. 2, looking in the direction of the arrow, and showing generally the lower portion of our machine; Fig. 2 is a vertical section on the line 2—2 of Fig. 3, looking in the direction of the arrow and showing more particularly the turntable and gearing for actuating the same; Fig. 3 is a vertical section on the line 3—3 of Fig. 1, looking in the direction of the arrow, and showing more particularly the hoppers and mechanism associated therewith for throwing either hopper into service, the other be-

ing simultaneously thrown out of action; Fig. 4 is a fragmentary plan view of the turntable carrying the knives for cutting the clay into strips; Fig. 5 is a section on the line 5—5 of Fig. 4; looking in the direction of the arrow, and showing means co-acting with the knives for removing pebbles and other small impurities; Fig. 6 is a section on the line 6—6 of Fig. 5, looking in the direction of the arrow and showing one of the members used for dislodging small pebbles or other impurities after the same have become dislodged; Fig. 7 is a section on the line 7—7 of Fig. 4, looking in the direction of the arrow and showing means for adjusting one of the knife plates; Fig. 8 is a section on the line 8—8 of Fig. 1, looking in the direction of the arrow, and showing one of the trap doors for discharging large pebbles or other hard pieces of material. Fig. 9 is a detail showing the hand lever for controlling a part of the mechanism used for ejecting pebbles and other impurities; Fig. 10 is a detail showing the hand lever appearing in Fig. 9 and cam mechanism controllable by said hand lever for governing a part of the pebble ejecting mechanism; and Fig. 11 is a section on the line 11—11 of Fig. 10, looking in the direction of the arrow.

The ground 9 is cut away so as to form a foundation pit 10, and disposed within this pit is a pan 11 into which portions of clay, if dropped accidentally during the operation of the machine, are adapted to fall in order to be easily removed. A pulley 12 is mounted upon a bearing 13 and extends downwardly into the upper portion of the pan 11. A conveyer belt 14 runs upon this pulley 12 and together therewith constitutes a conveyer for the purpose of removing clay strips, as hereinafter described. A pillar 15 is located centrally within the foundation bed and supports a vertical bearing 16, the latter being held upon the pillar by aid of bolts 17. At 18, 18^a are foundations which support a floor 19 of substantially circular form and provided with an outlet 20. At 21 is a slidable door for opening and closing the outlet 20, and below this outlet is a spout 22 extending downwardly to a point a little above the belt 14. Another belt 14^a (see Fig. 2) extends generally in a direction at a right angle to the belt 14 and runs upon a pulley 12^a supported by aid

of a bearing 13^a. The belt 14^a and a portion of the pulley 12^a extend downwardly into a pan 11^a. The floor 19 is provided with an outlet 20^a and spout 22^a, and associated with the outlet 20^a is a sliding door 21^a, this sliding door and the spout 22^a together with several other parts just mentioned being practically duplicates of similar parts above described and shown more particularly in the lower right-hand corner of Fig. 3.

The floor 19 is supported by sills 23 which rest upon the foundations. Mounted upon the floor 19 is a wall 24 of sheet metal and having generally a circular form. Beams 25 are supported by the foundations 18, 18^a and extending upwardly from these beams are vertical posts 26 which in turn support horizontal beams 27. Tie rods 28 extend through the beams 25, 27 (see Fig. 3) so as to hold them firmly in relation to each other, and also to other portions of the framework. At 29, 30 are two hoppers for holding the crude clay—that is, the stock being operated upon. Angle beams 31, 32 are used for the purpose of bracing the hoppers. At 33 is an angle beam which carries a vertical bearing 34 and extending through this bearing is a vertical shaft 35 which at its lower end is supported by the bearing 16. The upper end of the shaft 35 carries a bevel gear wheel 36. Two arms 37 carry two knives 38 and are supported by the shaft 35. These knives, because of their office, we designate as “sweeping knives”; they are adjustable relatively to the arms 37 and for this purpose are provided with slots 39 through which extend bolts 40. The bolts 40 are provided with nuts 41 which, by turning, are tightened or loosened, thereby securing or releasing the knives.

In order to connect the arms 37 with the shaft 35 we provide a collar 42 encircling the shaft and connected with the inner ends of the arms 37 so as to support the same. A spiral conveyer 44 is provided with a housing 43 having generally a trough-like form and disposed substantially horizontal. The spiral conveyer 44 is provided with a pulley 46 whereby it is actuated. A belt 47 engages the pulley 46 and also engages a pulley 48 which is mounted rigidly upon a shaft 49, this shaft extending through bearings 50, 51. A pulley 52 is likewise mounted upon the shaft 49 and fitted upon this pulley is a belt 53 by aid whereof it is driven. Fitted upon the shaft 49 is a bevel pinion 54 which meshes with the bevel gear wheel 36.

Disposed at the top of the hoppers 29, 30 are cross beams 55 supporting bearings 56 and extending from one of these bearings to the other is a shaft 57 carrying a pulley 58. Fitting upon this pulley is a broad belt 59, this belt and the pulley 58 together constituting a conveyer for carrying the

clay or stock to the top of the hoppers and discharging it thereinto. The hoppers 29, 30 are provided internally with sloping walls 60, 61 meeting at their tops. A door 62 is by aid of hinges 63 secured upon these sloping walls and is adapted to be thrown into either of two normal positions, as indicated by full and dotted lines in Fig. 3. An arm 64 is provided for the purpose of shifting the door 62 from one of its normal positions to the other. A sector 65 is disposed adjacent to the arm 64 and employed in connection with it for locking it in different positions.

When the clay is carried up by the conveyer belt 59 and discharged into the two hoppers 29, 30 or into either of them, it is formed into charges 66, as will be understood from Fig. 3. A turntable is shown at 67 and is provided with wearing plates 68 of divers forms, as indicated in Fig. 4, these wearing plates being removable and also interchangeable. When worn out they are readily taken off and replaced. The turntable 67 is provided with ribs 69 integral with it and also with projecting portions 70 which are mated by other projecting portions 71 carried by the ribs.

At 72 we provide plates which, because of their office, we designate as “supporting plates”; they are supported by aid of threaded bolts 73 which extend through the projecting portions 70, 71, as will be understood from Fig. 7. The bolts 73 when once adjusted are located by aid of nuts 74 which are forced up against the under sides of the projecting portions. Mounted upon the supporting plates 72 are other plates 75 which, because of their office, we designate as “knife plates”. They are secured to the supporting plates by aid of bolts 76. At 76^a, 76^b are bolts which extend not only through the knife plates 75 and supporting plates 72, but also through the projecting portions 70, 71 and thus serve to anchor the knife plates and supporting plates firmly in position. The bolts 76^a, 76^b are adjustable like the bolts 73, so that the knife plates 75 can be brought to the precise level of the upper portion of the wearing plate 68.

The supporting plates 72 are provided with downwardly extending hanger portions 79 and supported by and extending from the latter are pintles 77 held in place by bolts 78, the pintles 77 (see Fig. 6) being arranged in pairs and the pintles of each pair extending toward each other. At 80 are knives of considerable length carried by the turntable. These knives extend through slots 81 in the respective knife plates and are adjustably held in position by aid of bolts 82, these knives are removable and interchangeable.

At 83 is a trap member which is mounted

upon the pintles 77 and is adapted to rock when actuated, as hereinafter described. Extending downwardly from the trap member 83 is an arm 84. A second trap member 5 85 is disposed parallel with each trap member 83 but is somewhat shorter, and adjacent to each short trap member 85 is a short knife 86 as will be understood from Figs. 4 and 5. Each trap member 85 is mounted 10 upon pintles 85^a and is adapted to rock. Each trap member 85 is provided with an arm 87 extending downwardly, this arm being of greater length than the arm 84, as will be understood from Fig. 5. A bolt 88 15 extends through the arm 87 and is adjustable relatively to the same. For the purpose of locking the bolt 88 rigidly in position after its adjustment, we provide nut locks 89. The bolt 88 by lodging against 20 the ribs 69 serves as a limiting stop for preventing excessive travel of the arm 87. A link 91 is pivotally connected with the arm 87 and also with the arm 84. This link is provided with heads 91^a as will be under- 25 stood from Fig. 6.

At 92 is a roller through which extends a stub shaft 92^a, the latter being provided with a cotter pin 92^b, as shown more particularly in Figs. 10, 11. The stub shaft 30 92^a is supported by a lever 93 which has generally the form of a fork and is journaled upon a stub shaft 94 which extends through lugs 95, the latter being integral with an I-beam 96 forming a part of the 35 spiral conveyer casing 44 above described. The I-beam 96 is provided with a projecting flange 97 integral with it. A bracket 98 engages the underside of the flange 97 and is secured thereto by bolts 99. The 40 bracket 98 carries a cylindrical bearing 100 and extending through this bearing is a shaft 101. This shaft is provided with a set collar 102 (see Fig. 10) and also with an eccentric 103. The eccentric 103 is secured rigidly upon the shaft 101 by aid of 45 a key 104.

Mounted upon a stationary plate 104^a is a sector 105 (see Fig. 9), this sector being provided with two notches 106, 107. A 50 hand lever 108 is mounted rigidly upon the shaft 101 and carries a leaf spring 109, the latter being provided with a pawl 110 which is adapted to click into either of the notches 106, 107. The operator in grasping 55 the hand lever 108 places his fingers around the adjacent end of the leaf spring 109, and by pressing the same toward the lever, draws the spring away from the sector 105. The operator thus disengages the hand 60 lever 108, and by opening it shifts the hand lever into either of two normal positions, as will be understood from Fig. 9. One of these normal positions is shown in Fig. 10, in which the eccentric 103 is in such posi- 65 tion as to press the lever 93 upwardly so

that the roller 92 is in its uppermost position. The roller 92 is now partially within the path of travel of the shoe 90, and as the turntable revolves and this shoe comes into engagement with the roller 92, the lever 70 87 is tripped and pebbles are ejected as elsewhere described.

It so happens in some kinds of clay containing very few pebbles or other impurities that it is not necessary for the roller 75 92 to remain in its uppermost position. In this event, the operator grasps the hand lever 108, presses the spring 109 toward the hand lever, and thus disengages the pawl 110, after which he turns the hand lever 80 108 downwardly until the pawl 110 fits into the notch 107. This lifts the fixed portion of the eccentric 103 downwardly, and, of course, lowers the eccentric 103 and with it, the roller 92. The roller is now out of the 85 path of travel of the shoe 90, and, consequently, is unable to actuate the lever 87. The result is that the rocking members 83 are not actuated. As soon, however, as pebbles accumulate sufficiently, it may be 90 desirable to eject them, and in this event, the operator merely turns the hand lever 109 back into the position indicated in Fig. 10. This being done, the shoe 90 will periodically engage the roller 92 and the lever 95 87 will be tripped accordingly.

The operator, by examining the quantity and character of the clay strips passing the knives and dropping into the hopper, as 100 elsewhere described, can judge when it is proper to move the hand lever 108.

Above the spiral conveyer and connected securely to the housing 43 thereof is a hopper 111 for causing loose materials dropping 105 into this hopper to glide into reach of the conveyer. A spring 112 is connected at one of its ends to a bracket 113 (see Fig. 5), the opposite end of the spring being connected with the link 91. The purpose of the spring 112 is to restore the two arms 84, 87 to normal position each time they are 110 displaced. The arm 87 is so located that the rotation of the turntable will periodically bring the shoe 90 into engagement with the roller 92, so as to trip the arm 87, 115 and this arm, by its connection with the arm 84 through the medium of the link 91, causes the arm 84 to trip likewise. The result is that both the trap members 83, 85 are actuated, being rocked slightly in a 120 clockwise direction according to Fig. 5. The spring 112 is momentarily stretched each time the arms are thus tripped, and after the arms are tripped the spring retracts them to their respective normal positions. 125

Each hopper 29, 30 is provided with an opening 114 (see Fig. 8) and a number of separate doors 115 close each of these open- 130 ings. The doors 115 are mounted upon the

hoppers by aid of hinges 116, each door carrying a weight 117 extending obliquely upward from it and tending to keep it closed. The various doors 115 are thus normally closed by the weights 117. The purpose of the doors 115 will be understood from Fig. 8. Sometimes it happens that during the rotation of the turntable 67 a pebble 118 may find lodgment against one of the knives, say a long knife 80. The pebble being too large to be disposed as smaller pebbles are, is carried bodily along by the turntable until it lodges against one of the doors 115. The pressure of the pebble against the door causes the latter to open and the pebble is thus let out of the hopper.

The operation of our device is as follows: The various working parts being in action as above described, mined clay or stock is fed to the conveyer belt 59 and by this belt is conveyed up to the top of the machine. The door 62, under control of the arm 64, is shifted to the right or left according to the will of the operator, and as indicated by full and dotted lines in Fig. 3. If the door be to the right according to this figure, the clay drops into the hopper 29. If, however, the door 62 be to the left, or as indicated in dotted lines in this figure, the clay drops into the hopper 30, in either case piling up and remaining in the hopper until used up. The turntable 67 being constantly in motion, the long and short knives which it carries are passed successively under the hoppers. Each time a knife passes under one of the hoppers it cuts off a thin slice of the clay. It will be understood for this purpose that the clay contains more or less water and is to some extent plastic. Each knife takes off a thin shaving from the bottom of the charge of clay, and this shaving drops downward, lodging upon the floor 19. The sweeping knives 38 gather up all of the shavings and cause them to drop through the spouts 22, 22^a, and the shavings thus discharged are by aid of the conveyer belts 14, 14^a carried away from the machine and are ready for use. If, now, very small pebbles are present in the clay, these pebbles lodge against the knives 80, 86. Since, however, the trap members 83, 85 are periodically rocked (to the left according to Fig. 5, as above explained), the pebbles are easily discharged through the slots 81 and this takes place, of course, at the instant when the arm 87 is tripped by coming into engagement with the roller 92. The result is that any pebbles which have lodged against the adjacent edges of the knives 80, 86 are dislodged and thrown into the hopper 111 and by aid of the spiral conveyer are carried out of the machine. If it happens that large pebbles (see 118, Fig. 8) are present in the clay, they cannot pass through the slots 81 as just described, and are consequently carried along by the knives.

They are brought against the doors 115, and causing the latter to swing open pass out of the machine and are conveyed away. Suppose, for instance that, as indicated in Fig. 8, a large pebble 118 is lodged against the door 115. The pebble being now struck by the knife 80, the door 115 swings upwardly, allowing the escape of the pebble. The pebble 118, being once outside of the door 115, is acted upon by centrifugal force so that the pebble is immediately thrown off the turntable and thus finds its way to the floor.

The operator does not maintain the hand lever 108 in position, as shown in Fig. 10, if the clay be full of pebbles or similar impurities. If, however, the clay be comparatively free from such impurities, and, consequently it is not necessary to eject the pebbles very often, the lever 108 may be turned downwardly or into proximity to the notch 107, being turned back only in instances where it is desired that the pebbles be ejected periodically.

We realize that in the construction of the machine above described, various materials may be employed, and on this account we do not limit ourselves in the selection of such materials. Neither do we limit ourselves to the precise arrangement of the parts, as variations may be made therein without departing from the spirit of our invention.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. The combination of a turntable provided with projecting portions, a supporting plate resting upon said projecting portions, a knife plate detachably secured to said supporting plate, means for adjusting said supporting plate and said knife plate relatively to said projecting portions, a knife carried by said knife plate, a trap member carried by said turntable and disposed adjacent to said knife for the purpose of supporting a pebble lodging against said knife, and means controllable by the rotation of said turntable for shifting the position of said trap member in order to dislodge said pebble.
2. The combination of a turntable, a knife carried thereby for shaving portions of clay from a mass thereof, a trap member disposed adjacent to said knife and co-acting therewith to remove a pebble from against the edge thereof, an arm connected with said trap member, and means disposed within the path of travel of said arm for tripping the latter in order to actuate said trap member.
3. The combination of a turntable, a plurality of knives carried thereby for shaving off portions of clay from a mass thereof, trap members disposed adjacent to said knives for the purpose of temporarily supporting pebbles separated by said knives

from said clay, and means controllable by the rotation of said turntable for periodically tripping said trap members in order to discharge said pebbles.

5 4. The combination of a turntable provided with slots, knives carried by said turntable and extending through said slots for the purpose of shaving off portions of clay from a mass thereof, as said turntable is re-
10 volved, trap members disposed adjacent to said slots for the purpose of temporarily supporting pebbles separated from said clay by said knives; arms connected with said trap members, a link connecting one of said
15 arms with another in order that a plurality of said trap members may be actuated at the same time, and means controllable by rotation of said turntable for periodically actuating said trap members.

20 5. The combination of a turntable, knives carried thereby for shaving portions of clay from a mass thereof, trap members disposed adjacent to said knives for temporarily sup-
25 porting pebbles separated by said knives from said clay, means controllable by the rotation of said turntable for periodically tripping said trap members in order to discharge said pebbles, and mechanism con-
30 trollable at will for temporarily throwing said means out of action.

6. The combination of a turntable, a plu-

rality of knives carried thereby for shaving off portions of clay from a mass thereof, trap members disposed adjacent to said knives for temporarily supporting pebbles 35 separated by said knives from said clay; mechanism for periodically tripping said trap members, a roller for actuating said members, and means controllable at will for tripping the position of said roller in order 40 to render it temporarily inactive.

7. The combination of a hopper for holding clay, a turn table provided with knives for gradually removing said clay from said hopper, a conveyer, trap members co-acting 45 with said knives for removing impurities from said clay and bringing said impurities within reach of said conveyer.

In testimony whereof I have signed my name to this specification in the presence of 50 two subscribing witnesses.

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