

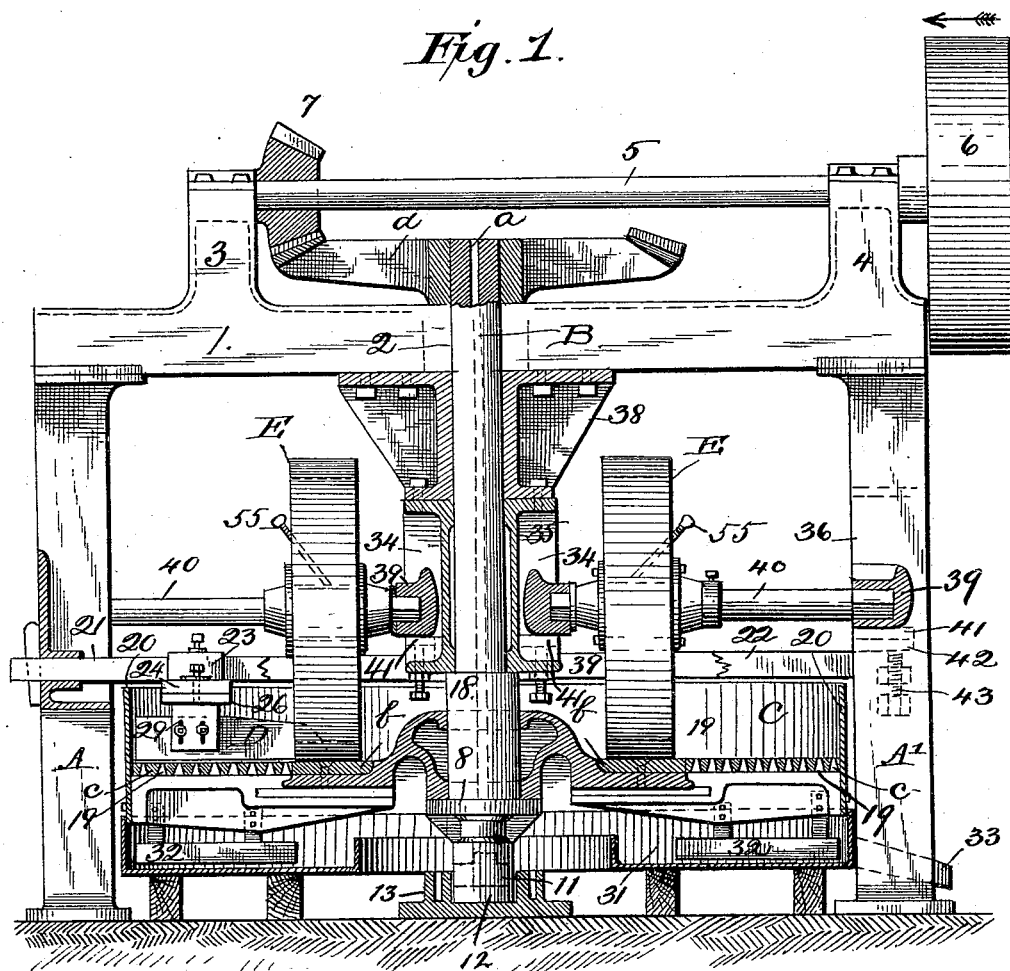
(No Model.)

4 Sheets—Sheet 1.

J. THOMPSON.
DRY CLAY GRINDING MACHINE.

No. 454,780.

Patented June 23, 1891.



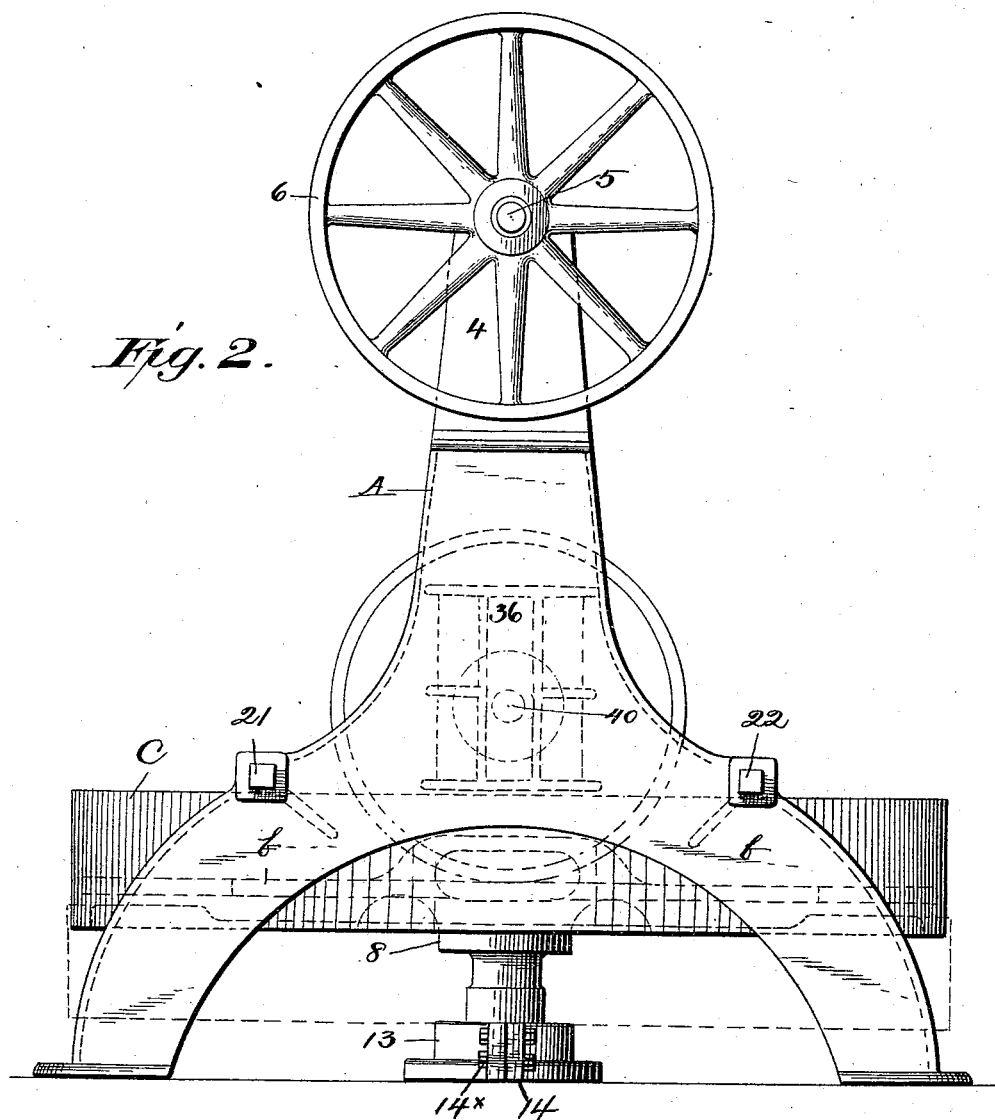
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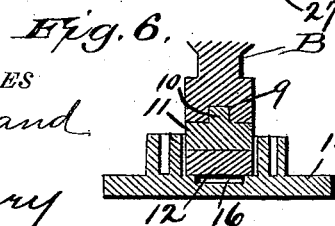
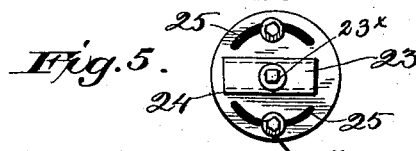
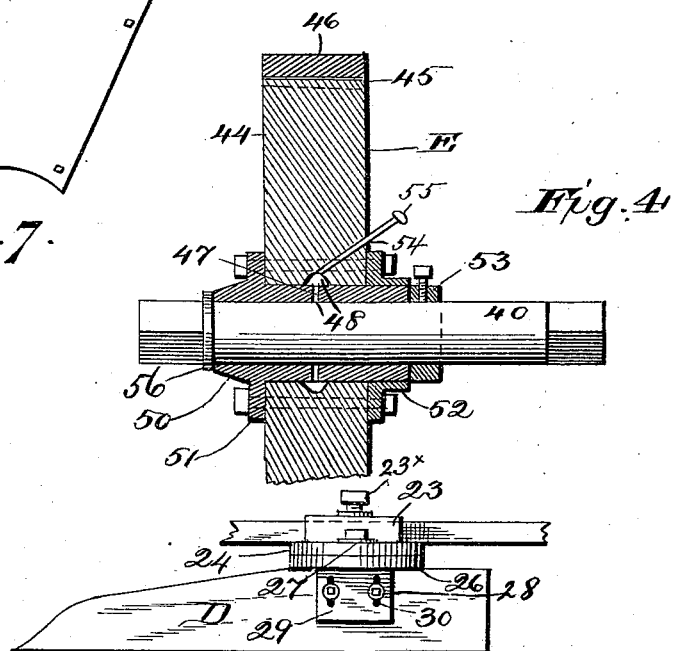
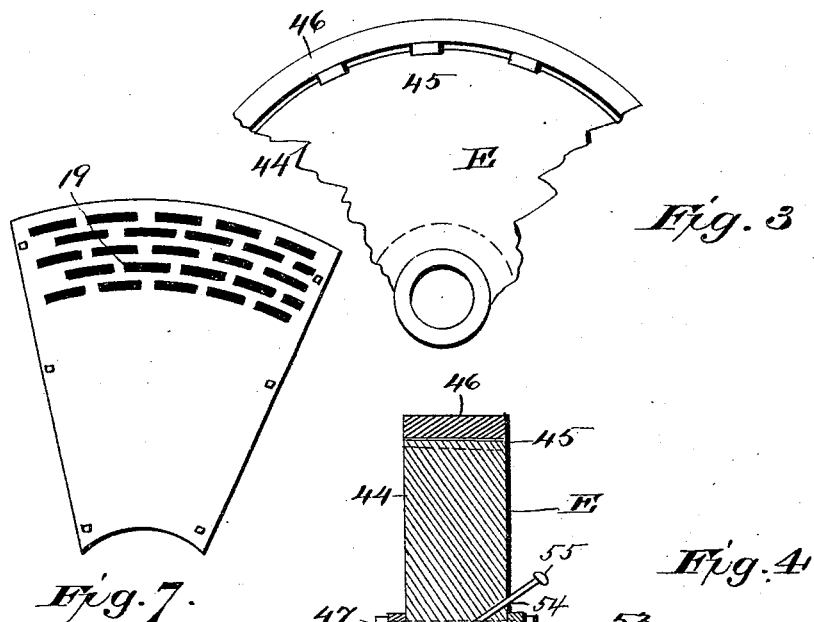
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DRY CLAY GRINDING MACHINE.

No. 454,780.

Patented June 23, 1891.



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No. 454,780.

Patented June 23, 1891.

Fig. 8.

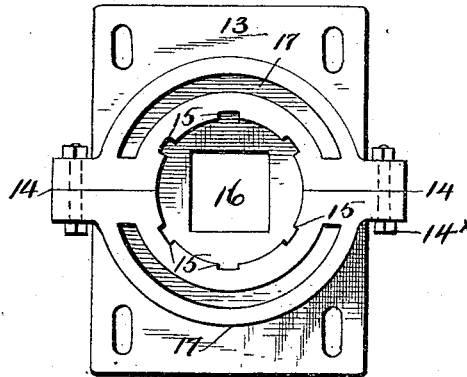


Fig. 9.

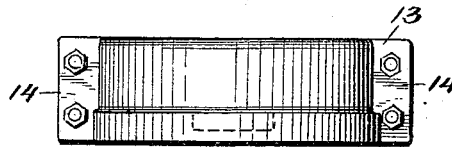


Fig. 10.

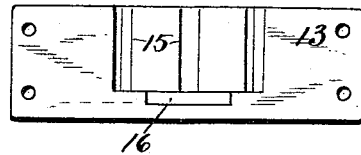
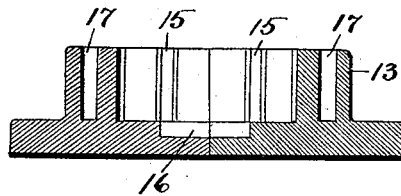


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOHN THOMPSON, OF BUCYRUS, OHIO, ASSIGNOR TO THE FREY-SCHECKLER COMPANY, OF SAME PLACE.

DRY-CLAY-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 454,780, dated June 23, 1891.

Application filed January 28, 1891. Serial No. 379,377. (No model.)

To all whom it may concern:

Be it known that I, JOHN THOMPSON, a citizen of the United States of America, residing at Bucyrus, in the county of Crawford and State of Ohio, have invented a new and useful Dry-Clay-Grinding Machine, of which the following is a specification.

My invention relates to improvements in machines for grinding dry clay, of that kind wherein a rotating receptacle usually styled a "dry-pan" and roller in the pan are used; and the object of the invention is to improve existing machines in this line of the art.

I now proceed to give a legal description of the invention, so as to distinguish it from other inventions in the art, and in such a manner that it may be made and constructed by those skilled therein and its construction and mode of operation fully understood.

I have fully and clearly illustrated the invention in the accompanying drawings, wherein—

Figure 1 is a detail view of the machine partly in section and in elevation. Fig. 2 is a side view of the machine looking from the direction indicated by the arrow in Fig. 1. Fig. 3 is a side view of a portion of one of the rollers, showing the manner of holding the tire on the roller. Fig. 4 is a detail sectional view of one of the rollers, showing the manner of securing it to the shaft. Fig. 5 is a detail of one of the scrapers in the dry-pan and means for adjusting its position in the pan and for securing it to the supporting-bar. Fig. 6 is a vertical section of the step-bearing of the vertical shaft. Fig. 7 is a detail of one of the bottom screen-plates of the pan. Fig. 8 is a plan view of the step-bearing of the central shaft. Fig. 9 is a side view of the same. Fig. 10 is an inside view of one of the sections of the bearing. Fig. 11 is a transverse section of the bearing.

A A' designate two substantial supports, consisting of heavy vertical standards provided with legs, these supports being made strong enough to sustain and carry the requisite machinery associated with the operation of the pan. The supports are connected near the top by a strong cross-piece 1, having a vertical bearing 2 formed therein to receive the vertical driving-shaft of the

pan, and on this cross-piece are standards 3 4, having bearing-boxes in them, in which is journaled the shaft 5, carrying a driving pulley or gear 6, and also a bevel gear-wheel 7, meshing with the bevel gear-wheel *d* on the vertical shaft. The vertical shaft B turns the pan and has its upper portion journaled in the bearing of the cross-piece 1, substantially as shown. The lower portion of this shaft is formed with a strong annular flange 8 well braced by strengthening the metal at this part, as shown, the central supporting-sleeve of the pan resting on this flange as its end bearing. In the lower end of the vertical shaft is an angular socket 9, in which the angular coupling-plug 10 on the bearing-piece 11 fits, as shown in the drawings, especially Fig. 6, and under the bearing-piece 11 is arranged a bearing-plate 12. The bearing-piece 11 and plate 12 are arranged in a bearing-box 13. This bearing-box 13 is made in two parts having flanges 14 extended therefrom, through which strong fastening-bolts 14^x are projected. In the inner face of the bearing-box 13 are vertical grooves 15 to take the lubricating material and supply it to the bearings, and in the bottom of the bearing-box is an oil-well 16, and to catch the oil in case it should at any time overflow annular chambers 17 are formed in the box. In the vertical shaft is a central hole *a*, and also through the bearing-piece and bearing-plate through which the lubricating material is conveyed to the parts at the lower end. As there is great weight on this bearing, and it is necessary to repair it at times, the bearing-box is made in two pieces, so that the shaft and pan may be raised slightly when it is necessary, the box-halves slipped out, and the bearings removed, repaired, and replaced without greater inconvenience than that of lifting the pan and shaft high enough to take the pressure from the bearings, the shaft 5 being removed for such purpose.

C designates the pan, formed with a central sleeve 18, keyed to the vertical shaft and having a number of radiating arms extending from the flange or hub of the sleeve, on which are strongly secured the bottom plates *b*, of chilled iron, constituting the track or floor, a part of which travels under

the rollers. The outer portions of the floor extending beyond the track of the rollers are composed of plates *c*, fastened in place upon the arms of the pan and formed with 5 curved inner ends fitting against the periphery of the track and provided with a number of slots 19, through which the clay is scraped by the scrapers. It has been the usual custom to make these clay slots or escapes radially arranged; but this arrangement does 10 not discharge the clay as freely and uniformly as the capacity of the machine demands, and to remedy this defective discharge of clay through the slots I arrange them 15 lengthwise and concentric to the direction of rotation, as shown in Fig. 7 of the drawings. The clay is thus swept through the openings continuously and passes through them freely. The casing 20 of the pan is a substantial metal plate secured around the bottom and fastened to the ends of the radiating arms of the pan, as indicated in Fig. 1 of the drawings.

The standards *A A'* are given additional 25 security by cross-bars 21 22, and on these are adjustably secured the scrapers *D*. On the cross-bar is arranged a sleeve 23, adjustable on the cross-bar and kept in position by a set-screw. On the sleeve 23 is a disk 24, arranged with its face on a horizontal plane 30 and formed with concentric slots 25. A bracket having a disk 26, corresponding in size to the disk 24, is bolted to the latter by bolts 27 let through the slots in the upper disk, and on the disk 26 is attached a plate 29, having 35 vertically-arranged slots 30 therein, through which bolts 28 are projected, as shown, these bolts also passing through the scraper *D*. It will thus be perceived that the scraper can be adjusted endwise by moving the sleeve on the cross-bar and directed at any desired angle by moving the disks. Said scrapers may also be adjusted vertically by means of the 40 bolts 28 and slots 30. The scraper has a curved upper end portion to set close under the roll, and the under edge is straight to sweep the bottom of the pan.

Under the dry-pan is arranged a circular trough or box 31, swept by scrapers 32, depending from the arms of the pan-bottom, the 50 ground clay being pushed into a spout 33, leading to elevating apparatus, as usual. This trough 31, with its scraper mechanism, forms no part or parcel of my invention.

In the inner face of the standards *A A'* are 55 formed vertical ways 36, the sleeve 35 being supported from a bracket 38, secured to the cross-piece connecting the upper part of the supports. In the ways 34 and 36 are arranged bearing-boxes 39, in which are mounted 60 fixed shafts 40. These bearing-boxes are loosely and adjustably seated in the ways, the adjustability being attained through cushions 41 to relieve the jar, a plate 42 to hold the box and cushion, and a set-screw 43 65 to adjust the parts. By these means the shaft with the roller thereon may be raised

and lowered to accommodate the pressure. The cushions 41 are preferably blocks of hard rubber. The ends of the boxes 39 are curved, 70 as shown, to allow the shaft to be lightly tipped or raised at its ends should a hard substance be drawn under the rollers which their weight should be insufficient to disintegrate. 75

E designates the roller, consisting of the following elements: a strong heavy body 44, having transverse grooves 45 to receive fastening-wedges to hold the tire in place, and a tire 46, 80 of chilled iron. In the hub of the roller is an annular oil-groove 47, having an oil-hole 48 leading thereto and communicating with an inclined oil-duct 54, provided with a removable pin 55. On the shaft 49 of the roller is a sleeve 50, having a flanged head 51. This 85 sleeve runs through and projects beyond the opposite side of the roll, and has secured on its projecting part a flanged collar 52, a collar 53 being fixed on the shaft to hold the sleeve from movement in that direction, it being 90 prevented from movement in the opposite direction by a flange 56 on the shaft 40, the sleeve 50 and collar 52 being held to the roller by bolts passed through the flanges and roller. This gives the roller a good bearing 95 on a fixed shaft. Motion is communicated to the pan through the vertical shaft and its gear connections, and the clay, being thrown in the pan, is carried under the rolls by the scrapers, while at the same time the ground 100 clay is swept by them over the floor and drops through the slots of the screening-flutes.

Having thus specified the construction, explained the operation, and identified the principle thereof, as required by the statute, I now 105 proceed to particularly point out and distinctly claim the parts and combinations.

I claim as my invention as follows:

1. In a clay-grinding dry-pan machine, the combination of the revolving vertical shaft 110 having an angular socket in its lower end, the dry-pan fixed on the vertical shaft, a bearing-piece having an angular plug to set in the angular socket of the vertical shaft, a bearing-plate under the bearing-piece, and a bearing- 115 box to hold the bearing plate and piece, consisting of two sections provided with projecting flanges detachably connected together, whereby when the vertical shaft is raised the end bearings may be removed, substantially 120 as and for the purpose specified.

2. In a clay-grinding machine, the combination of the vertical revolving shaft having an angular socket in the lower end of the shaft and a vertical opening through its center, a 125 bearing-piece having an angular plug to engage the socket of the vertical shaft and a vertical central hole through its center, and a bearing-box to hold the said plate and piece, consisting of two parts connected together and 130 formed with vertical oil-grooves in their under face, substantially as and for the purpose specified.

3. In combination with a dry-pan of clay-

grinding scrapers supported in the dry-pan and composed of a sleeve to take the support and formed with a disk having concentric slots, a disk formed with a depending flange, 5 having vertically-arranged slots, bolts to hold the disks adjustably together, and a scraper-blade adjustably connected to the flange of the lower disk, as specified.

4. In a clay-grinding machine, the combination, with a dry-pan and its vertical shaft, of 10 a supporting-frame formed with vertical ways, a fixed sleeve having the vertical shaft projected through it and formed with vertical ways, bearings loosely seated in the vertical 15 ways of the frame and sleeve, fixed shafts in the bearings, and rollers journaled on the shafts, substantially as described.

5. In a clay-grinding machine, the combination, with the dry-pan and its vertical shaft, 20 of a supporting-frame formed with vertical

ways, a fixed sleeve having the vertical shaft projected through it and formed with vertical ways, bearings loosely disposed in the vertical ways and formed with curved outer faces, fixed shafts in the bearings, and rollers loosely 25 journaled on the shafts, substantially as described.

6. In a clay-grinding mill, the combination, with the pan, of the rollers mounted on the shaft 40 and adjustable bearings for said 30 shafts formed with curved outer end faces, whereby the shafts may be moved vertically and tilted, substantially as described.

In testimony whereof I hereunto set my hand in the presence of two attesting witnesses. 35

JOHN THOMPSON.

Attest:

JAMES ARTHUR FREY,
W. S. HIGHT.