

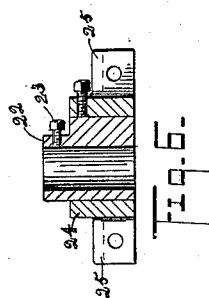
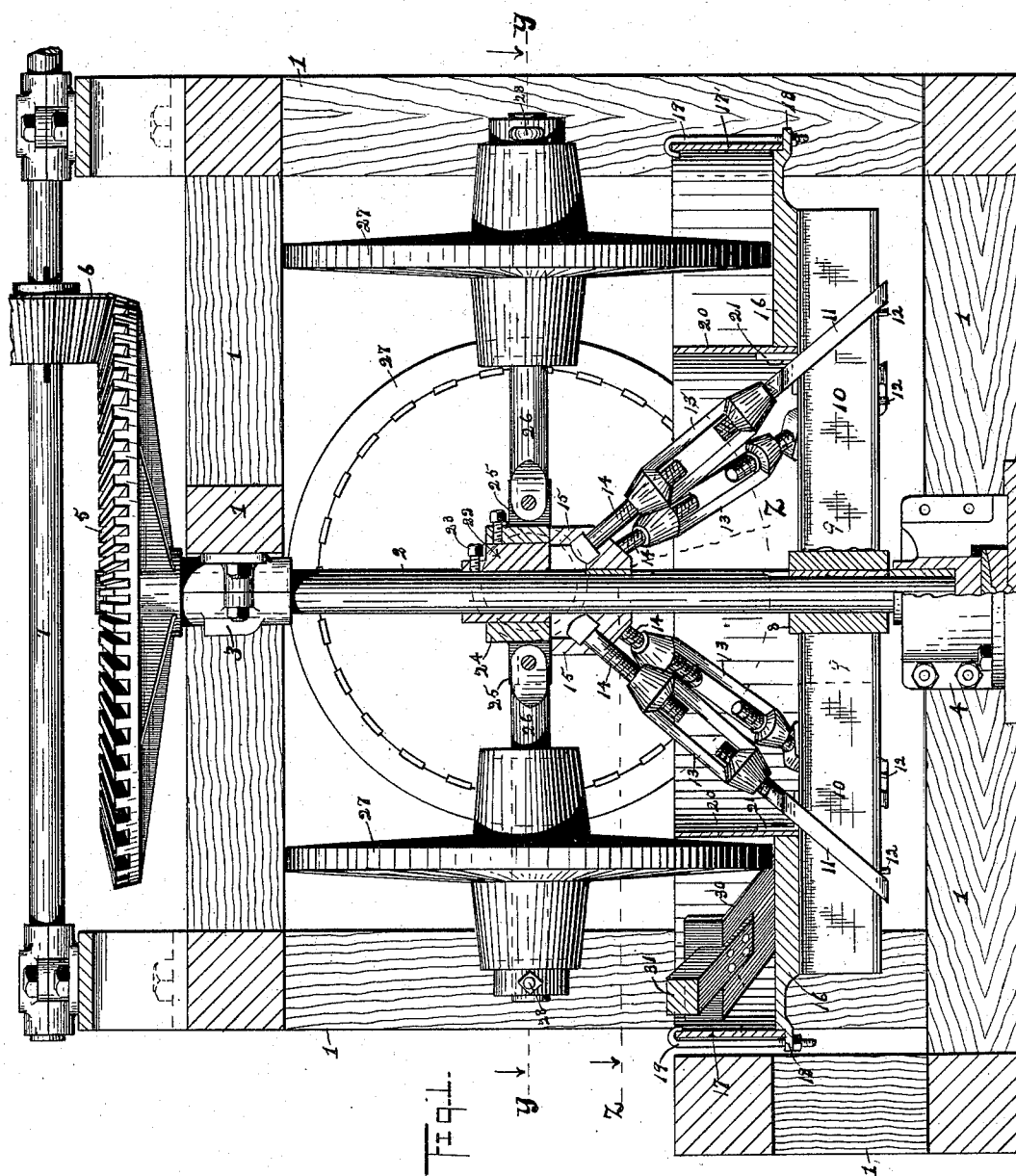
(No Model.)

3 Sheets—Sheet 1.

H. B. CAMP.
CLAY MILL.

No. 533,114.

Patented Jan. 29, 1895.



WITNESSES

Belle S. Lowrie.

C. E. Humphrey

INVENTOR

Horace B. Camp,
by

 $\bar{b}_x$

ATTORNEY.

C. Humphrey

(No Model.)

3 Sheets—Sheet 2.

H. B. CAMP.
CLAY MILL.

No. 533,114.

Patented Jan. 29, 1895.

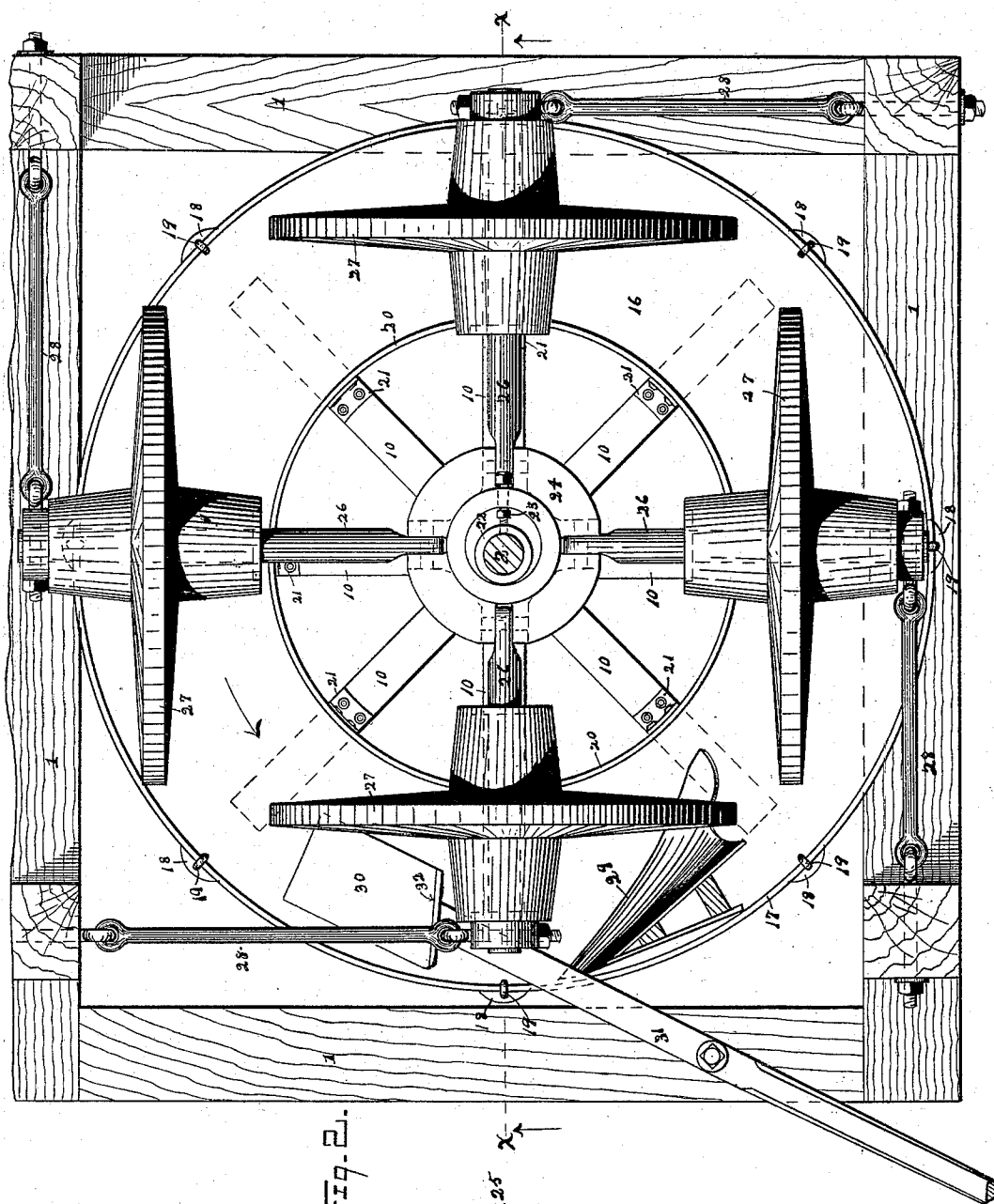


Fig. 2.

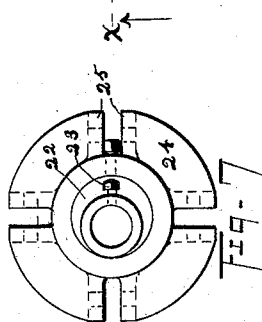


Fig. 3.

WITNESSES.

Belle S. Lowrie
C. Humphrey

INVENTOR.

Horace B. Camp,
by

ATTORNEY.

C. Humphrey

(No Model.)

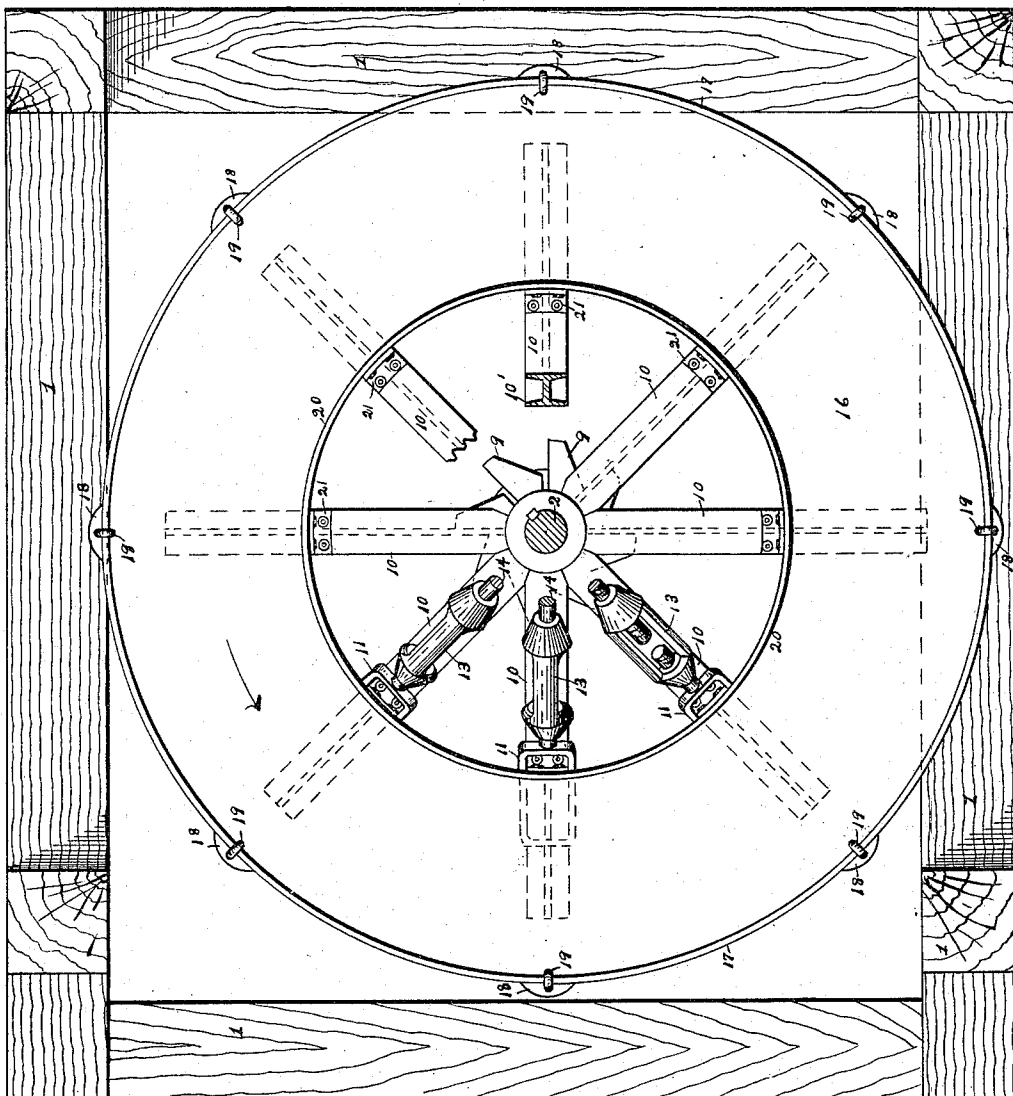
3 Sheets—Sheet 3.

H. B. CAMP.
CLAY MILL.

No. 533,114.

Patented Jan. 29, 1895.

Fig. 3.



WITNESSES

Belle S. Loring.

C. C. Humphrey

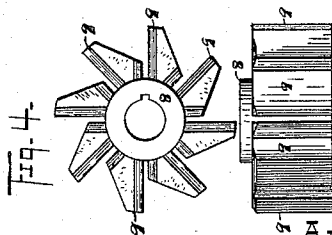


Fig. 4.



Fig. 5.

INVENTOR

Horace B. Camp,

by C. C. Humphrey, his

ATTORNEY

UNITED STATES PATENT OFFICE.

HORACE B. CAMP, OF CUYAHOGA FALLS, OHIO.

CLAY-MILL.

SPECIFICATION forming part of Letters Patent No. 533,114, dated January 29, 1895.

Application filed January 16, 1894. Serial No. 497,017. (No model.)

To all whom it may concern:

Be it known that I, HORACE B. CAMP, a citizen of the United States, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Clay-Mills, of which the following is a specification.

My invention has relation to that class of mills for grinding clay and analogous substances in which the material is broken and reduced by vertically-revolving wheels upon an annular horizontal bed, and in which the bed revolves and the reducing wheels maintain generally the same relative position thereto.

The object of my invention is to produce a new and improved mill of the class designated, of unusual simplicity in construction and of great strength, wherein all parts of the bed shall be subjected to the action of the wheels, without intricate machinery for causing them to cross and re-cross the same, and which shall embody an improved device for continuously subjecting the material to the wheel tracks, and shall have an appliance for changing the line of travel of the wheels to avoid forming channels or grooves in the bed; and its further object is, by means of a novel construction, to retain the bed and connected parts together with a minimum of fastening bolts, and to thereby avoid the loosening of the same, usually incident to jarring; and to permit the ready assembling of the parts; and the replacing of parts where it may at any time become necessary.

To the aforesaid objects my invention consists in the peculiar and novel construction, arrangement and combination of parts hereinafter described and then specifically pointed out in the claims, reference being had to the accompanying drawings, which form a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different views, Figure 1, is a central vertical section of my improved clay mill at the line *x, x*, of Fig. 2, excepting the wheels and shafts which are not sectioned; Fig. 2, a plan of the same from the section line *y, y*, of Fig. 1; Fig. 3, a plan, the left half in section at the line *z, z*, of Fig. 1, the right half being otherwise broken as hereinafter described;

Figs. 4 and 5, plan and side elevation respectively, slightly enlarged, of bed-supporting hub; Fig. 6, a detached view of the bolt-retaining hub; and Fig. 7, a detached view of the axle sleeve and internal shifting cam.

Referring to the drawings, 1, is a framework in which is mounted a vertical shaft, 2, journaled in a box 3, on a central cross-beam of the frame 1, and in a step 4, and bearing at its upper end a bevel gear, 5, in which meshes a smaller bevel gear 6, mounted on a horizontal shaft 7, journaled in suitable boxes in the frame 1, and to which the driving power is communicated in any approved form. On this shaft 2, is securely keyed a hub 8, having a series of radial wings 9, see Figs. 1, 3, 4, and 5, to receive and retain the inner ends of the I-beams hereinafter described. These wings are of the peculiar shape shown in the last mentioned drawings, having a general triangular shape, and situated and separated so as to permit the central web of the I-beams to enter between them and rest against the hub, 8, each having on its longer and shorter faces vertical flanges to rest against said central web and between the upper and lower flange of said beam. Between each pair of wings is inserted one end of an I-beam, 10, (a cross section of which, 10', is shown at the right of the center of Fig. 3,) which rests against the hub 8, and extends horizontally, radially outward for a certain distance hereinafter specified. The peculiar advantage of this construction is that the I-beam is held firmly in place without bolts the top and foot of the beam inclosing the top and bottom of the wings on the hub, while the main web of the beam is snugly up against the vertical portion of the wing. The outer end of each of these I-beams is supported by a compound diagonal stay consisting of a lower bolt 11, having a loop that surrounds the I-beam and rests against a lug or abutment 12 on the under side of the I-beam, its upper end being screw-threaded and meshing in the turnbuckle 13, which unites it with a bolt 14, the head of which rests in a recess in a hub 15, keyed or otherwise rigidly attached to the shaft, 2. By this arrangement each I-beam can be independently adjusted to form a perfectly true support for the bed; to conform to any inequalities of the latter; and to per-

mit its ready removal and replacement when necessary.

On the outer ends of the I-beams 10, is the annular bed, 16, preferably cast in a single piece, which extends beyond the ends of said beams, the portion of which that rests on the beams being heavy to receive the tread of the grinding wheels, the projecting edge being thinner, as shown in Fig. 1. Around the outer edge of this bed is the outer curb, 17, which rests on lugs 18 cast on the edge of said bed, and is retained by hooked bolts 19, which pass through said lugs and are retained in said lugs by nuts on the under side. The inner curb, 20, rests on the I-beams, and is rigidly retained against the inner edge of the bed by angle irons 21, bolted to said beams. Above the hub 15, is freely mounted on the shaft 2, an eccentric sleeve 22, capable of being revolved thereon, and held in any desired position by a set-screw 23. Fitting on the cam 22 is a sleeve 24, having pairs of radial wings 25, between each pair of which is hinged the inner end of an axle, 26. These axles are of different lengths, and on each is journaled a grinding wheel 27, having an elongated hub properly protected by caps at the ends to prevent the entrance of dust and grit.

Each wheel is of cast iron, the hub being integral therewith and provided with a tire, as shown in the intermediate wheel of Fig. 1. These wheels are located at different distances from the axle 2, and retained in place relatively thereto by suitable mechanism so that their peripheries will travel on different parts of the bed, their aggregate tread covering substantially the width of the bed from the inner curb to the thinner part thereof hereinbefore described.

Each axle 26, with its wheel is securely anchored against being carried about by the revolution of the bed by a link 28, attached to an eye in the outer cap of the axle, and a similar eye in a post of the frame 1, which construction, however, permits of limited vertical motion of the wheel and axle and horizontal motion of the former on the latter. When the wheels have run in their several tracks for a suitable length of time, which will be determined by their action in wearing the bed, the cam 22, is released and partially revolved in the sleeve 24, thereby changing the positions of the pivotal points of the axles 26, by moving them to or from the central shaft and causing corresponding changes in the lines of travel of the wheels, by which arrangement the cutting of grooves or channels in the bed is avoided.

Directly inside the outer curb of the bed is a scraper 29, Fig. 2, shaped similarly to the mold-board of a plow, with its point opposite the movement of the bed. Attached to the frame in any desired manner, but preferably by a link, and arranged to ride on a bed and adapt itself to any vertical movement of the latter, its office being to scrape the material from the bed near the outer curb and simul-

taneously turn it over and throw it into the paths of the wheels.

The material, when ground, is removed from the bed by a shovel 30, supported and operated by a handle 31, connected by a flexible joint to the frame 1, and so arranged that it can be swung into the bed with its edge opposite the motion of the latter, by which the ground material is driven upon the shovel, and, being deflected, by a diagonal flange 32, falls outside the curb into any approved receptacle.

I claim as my invention—

1. In a mill of the class designated the combination with a vertical, central shaft, an annular horizontally revolving bed mounted on radial arms attached at their inner ends to a hub on said shaft, their outer ends being sustained by stays attached to a second hub on said shaft, of a number of vertically revolving wheels arranged to run thereon, mounted on axles anchored against revolution with said bed, substantially as shown and described.

2. In a mill of the class designated the combination with a vertical central shaft, an annular horizontally revolving bed mounted on radial arms attached at their inner ends to a hub on said shaft, their outer ends being sustained by stays attached to a second hub, of a number of vertically revolving wheels arranged to run on said bed and mounted at different distances from the center of said shaft on axles anchored against revolution with said bed, substantially as shown and described.

3. In a mill of the class designated the combination with a vertical central shaft, an annular horizontally revolving bed mounted on radial arms attached at their inner ends to a hub on said shaft their outer ends being sustained by stays attached to a second hub, of a number of vertically revolving wheels arranged to run on said bed, mounted on axles anchored at their outer ends against revolution with said bed and flexibly fastened at their inner ends to a hub on said shaft, said hub embracing between itself and said shaft an eccentric sleeve capable of rocking said axles and wheels horizontally on said bed when so desired, substantially as shown and described.

4. In a mill of the class designated, the combination with an annular horizontally-revolving bed, and a vertical central shaft and a number of radial horizontal axles adapted to carry wheels to run on said bed, having their outer ends anchored against revolution therewith, and a hub surrounding said vertical shaft to which the inner ends of said axles are attached, of an intermediate eccentric sleeve adapted to unite said hub and shaft and arranged to be attached to and revolved about the latter as desired, substantially as shown and described and for the purpose specified.

5. In a mill of the class designated the combination of a vertical central shaft, a number of wheels mounted on axles anchored at their outer ends against revolution, an annular

horizontally revolving bed mounted on I
beams fastened to a hub on said shaft, said
hub having recesses to receive and hold said
beams the outer ends of said beams supported
5 by stays connected with a second hub on said
shaft substantially as shown and described.

6. In a mill of the class designated the com-
bination with a central vertical shaft, and a
support for the annular bed consisting of ra-
10 dial beams, retained at their inner ends by a
hub on said shaft, and their outer ends sus-

tained by stays united with a second hub
mounted on said shaft of an annular bed
adapted to rest on said beams outside of said
stays substantially as shown and described. 15

In testimony that I claim the above I here-
unto set my hand.

HORACE B. CAMP.

In presence of—

C. E. HUMPHREY,

C. P. HUMPHREY.