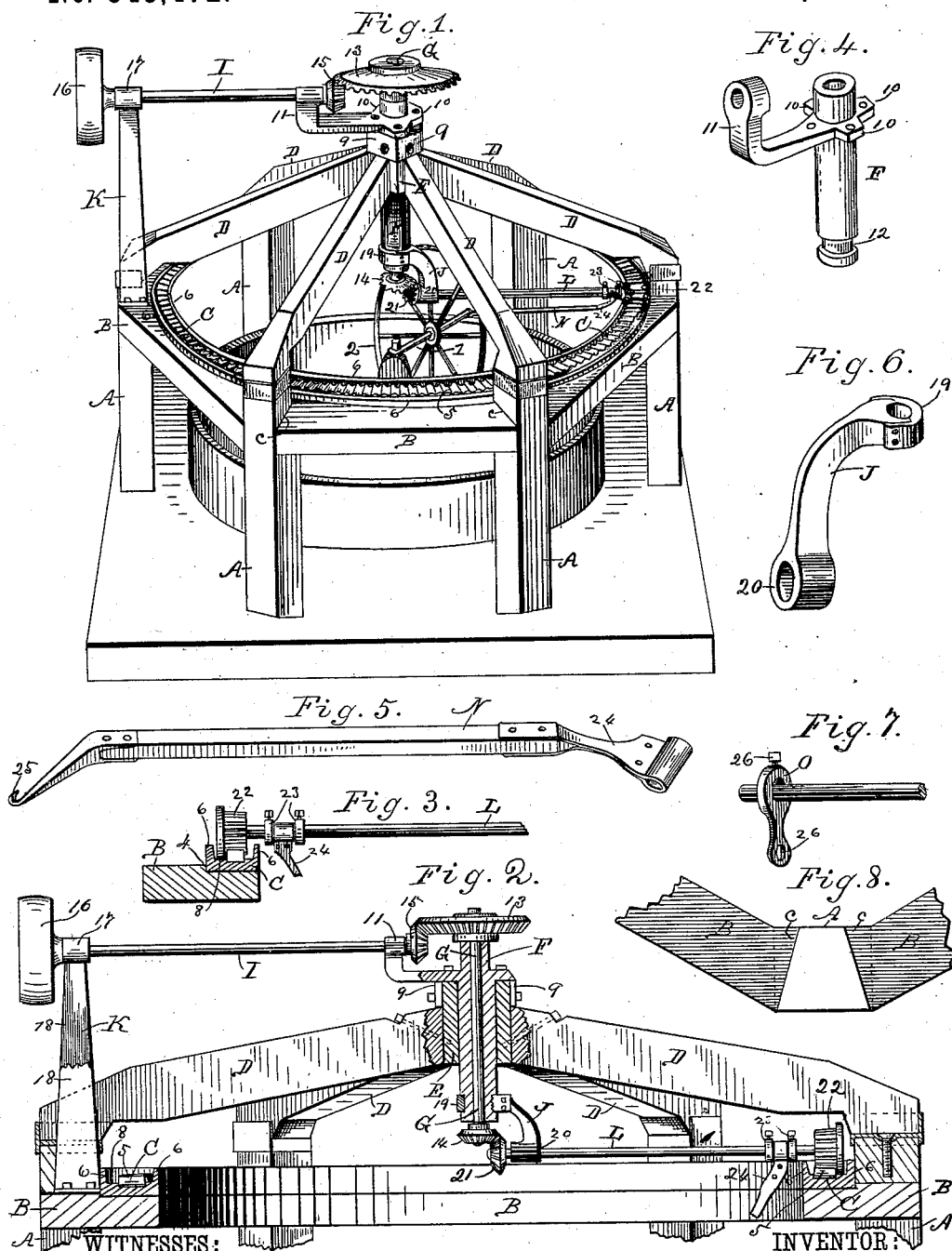


(No Model.)

F. MIDDLETON.  
CLAY TEMPERING MACHINE.

No. 343,472.

Patented June 8, 1886.



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# UNITED STATES PATENT OFFICE.

FRANK MIDDLETON, OF RICHMOND, VIRGINIA.

## CLAY-TEMPERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 343,472, dated June 8, 1886.

Application filed January 14, 1886. Serial No. 188,614. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK MIDDLETON, of Richmond, in the county of Henrico and State of Virginia, have invented a new and useful  
5 Improvement in Clay-Tempering Machines, of which the following is a description.

My invention is an improved clay-tempering machine, and relates to a novel construction of the main frame, and to certain features of  
10 the construction for transmitting and applying the power; to which ends the invention consists in certain novel constructions and combinations of parts, as will be described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective view of my apparatus. Fig. 2 is a side elevation thereof, parts being broken away and others shown in section. Fig. 3 is a detail cross-section of the frame, cross-beam, and  
20 the circular track, with the carrier-pinion in place on the latter. Fig. 4 is a detail perspective view of the center bearing-tube. Fig. 5 is a detail perspective view of the pitman, showing the manner of connecting the same  
25 with the traveler-shaft. Fig. 6 is a detail perspective view of the bearing-connection. Fig. 7 is a detail perspective view showing a portion of the tempering-wheel shaft and the collar and set-screw thereon, and Fig. 8 is a detail top plan view of one of the posts.

The objects of my improvements are, to secure steadiness of frame and machinery when in operation; to provide a circular cog-track  
35 up by the traveler-pinion, and will prevent it from dripping off; to simplify the mechanism for transmitting and applying the power; to so form the main frame that the weight and motion of the machinery will stiffen the whole  
40 main frame; and a further object is to economize material in the construction of machinery of this class.

In the drawings I have shown the posts A as mounted on a base-piece. It will be understood that in practice such posts may be sunk  
45 in the ground, or may have any other suitable foundation-support. I arrange these posts in a circular form around the clay-pit, which may be of common construction, having a central  
50 bearing for the shaft 1, carrying the tempering-wheel 2, such shaft and wheel being also

of the common construction. The upper ends of posts A are joined by cross-beams B.

In the present instance the posts A have the opposite sides of their upper ends mortised at 3, to receive the cross-beams, and the  
55 walls of such mortises on the opposite side of the same post diverge toward the outer side of the post, as shown most clearly in Fig. 8.

The cross-beams B serve as a foundation for  
60 the circular track C, and are preferably grooved at 4, to form a seat for such track, although such groove might be omitted where so desired.

By the circular arrangement of the posts A  
65 and B, which constitute what, for convenience of reference, I denominate the "outer frame," I provide a firm foundation for the circular track D, which is usually seated in a groove,  
70 4, formed in the upper side of the cross-beams at the inner edges thereof.

The track C is provided at about its center with the rack 5, and is provided on opposite sides of such rack with the elevations or  
75 flanges 6. The object of these flanges is to prevent the oil used to lubricate the rack from flowing off and wasting, and also obviate the dripping of such oil onto the workmen below. This track is depressed at 7, at the base of the  
80 cog-rack, so the oil will accumulate in such depression, and will be taken up and distributed by the traveling pinion in the operation of the apparatus.

Between the cog-rack and the outer flange of the carrier I form a smooth bearing, 8, for the  
85 plain-faced pulley of the traveling wheel.

The arch-frame is formed of a series of beams, D, having their outer ends supported on the tops of posts A. These beams D may be secured to the outer frame by seating them in  
90 socketed castings secured on the tops of the posts, as shown, or they may be secured to the posts by lag-bolts, as will obviously appear. These beams D rise toward the center, where they are usually secured to or against a center-piece or key-block, E, which latter is preferably hexagonal, as shown, or, where more  
95 or less beams D are used, with a number of sides corresponding to the number of beams employed. It is usual to provide this key-  
100 block with small metallic blocks 9, secured to it, one above each of the beams D. Mani-

festly, the joint between beams D and block E may be formed by mortising the beams into the block or in other suitable manner. By thus elevating the arch-frame at the center I attain two desired ends. In the first place, I provide a support for the drive mechanism sufficiently above the track to avoid the necessity of hangers or similar expedients, by which to support such track. Another important result is that the weight and motion of the operating mechanism, instead of sagging the top frame and rocking the entire framing, as is the case where the top frame is formed horizontal, will rather operate to tighten and increase the rigidity of the framing by the weight and motion operating at the crown of the arch, causing the arch-frame to press out on the outer frame, as will be understood.

The key-block is provided with a vertical opening for the central bearing-tube, F. This tube forms a bearing for the vertical shaft G, and is provided with a bearing-flange resting on the key-block. This flange might be formed a disk, but it preferably consists of a number of arms, 10, as shown. I provide this bearing-tube with a bracket, H, usually an extension of one of the arms 10, and provided at its outer end with a bearing, 11, for the upper or countershaft, I. Near its lower end the bearing-tube is provided with an annular groove, 12, for the connection-piece J. The vertical shaft J is journaled in the center bearing-tube, and is provided at its upper end with a gear, 13, and at its lower end with a gear, 14. The counter-shaft is journaled near its inner end in the bearing 11, and has at such end a gear, 15, meshing the gear 13 of shaft G. At its outer end the counter-shaft has a pulley, 16, to receive a belt from the source of power, and is journaled near said end in the bearing 17 of the standard K. This standard, it will be seen, is formed with two legs, 18, which rest on the outer frame, and are usually disposed one on each side of one of the posts A thereof. By the use of this counter-shaft I avoid the use of twist-belts and the like, necessary when power is communicated by belt directly to the vertical shaft, and facilitate the application of the power and avoid the slipping consequent to the use of twist-belts.

The connection-piece J is provided at one end with a cuff or removable bearing, 19, fitting the groove 12 of the center-piece, and bolted or otherwise suitably secured to the body or web of the connection, which has at its opposite end a bearing, 20, for the traveler-shaft L. It will be noticed that the body or web of the connection is curved, and all abrupt bends or angles are avoided, giving the greatest strength with the least expenditure of metal, as will be seen. This connection, it will be seen, revolves around the central bearing-tube, its bearing 19 turning in the annular groove 12, as shown.

The traveler-shaft L is journaled at its inner end in bearing 20, and has a pinion, 21, meshing the lower gear of the vertical shaft. At

its outer end, shaft L has the traveler M, having a cog-wheel, 22, meshing the circular cog-rack of track C. As the vertical shaft is turned by means of the counter-shaft, the traveler will by the meshing of cogs 22 in the circular rack, be caused to move around the center bearing, as will be understood from the drawings and foregoing description.

To the shaft of the carrier is connected one end of a pitman, N, which may be formed of wood or iron, or, as is preferred, of wood and iron combined. In order to form this connection, it is preferred to secure two collars, 23, on the traveler-shaft, and to secure the split cuff 24 of the pitman on the shaft between said collars. The opposite end of the pitman is provided with a hook, 25, which engages an eye, 26, on the collar O. This collar is fitted on and movable along the tempering-wheel shaft.

To secure the pitman from slipping in against the tempering-wheel, and at the same time obviate the necessity of braces and the like, I employ a set-screw, 26, turning through the collar O, and bearing against the tempering-wheel shaft. This set-screw operates to secure the collar to the shaft, and permits it to be adjusted as may be desired.

Heretofore machines for transmitting power to clay-tempering machines have been in use for a long time. I do not claim any of those old principles as used in such machines as inventions of my own; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a clay-tempering machine having a traveling shaft and intermediate gearing connecting the same with the driving-gear, a main frame comprising an outer frame and an arch-frame, which supports the intermediate gearing, supported at its outer end on the outer frame, and having its central portion or crown elevated, substantially as and for the purposes specified.

2. In a clay-tempering machine, a frame comprising standards or uprights having connecting-beams and arranged in approximately a circular series, whereby to provide an elevated support for the circular track, substantially as set forth.

3. In a clay-tempering machine, a main frame consisting of a circular outer frame having vertical posts and cross-beams connecting said posts, and the arch-beams supported at their outer ends on the posts, and being inclined upward toward their inner ends, substantially as set forth.

4. In a clay-tempering machine, a circular track having a cog-ring and provided on opposite sides thereof with guard flanges or elevations, whereby to prevent oil passing off of the edge of such track, substantially as set forth.

5. A clay-tempering machine having a circular track provided with guard flanges or elevations, and having a cog-ring between said elevations, the cogged portion of the track being depressed, whereby oil will accumulate at

the base of such cogs, and the traveling pinion meshing said cog-ring, whereby oil will be distributed thereby, substantially as set forth.

6. The combination, with the circular track, 5 the traveling pinion, the shaft supporting said pinion, a vertical shaft geared with aforesaid shaft, and a gear on said vertical shaft, of the counter-shaft operating above the central gearing, and having a pinion meshed with the 10 gear of the vertical shaft and provided with a pulley, whereby to facilitate the transmission of power from the driver, substantially as set forth.

7. The combination of the outer frame, the 15 beams D, a center-piece or key-block, and a bearing-tube, F, the traveler-shaft, and the vertical shaft geared therewith and journaled in tube F, substantially as set forth.

8. The combination, in a clay-tempering 20 machine, with the traveler-shaft, the vertical shaft, and the counter-shaft, of the center bearing-tube encircling the vertical shaft and provided with a flange adapted to rest upon the supporting-frame, and having a bracket 25 provided with a bearing for the counter-shaft, substantially as set forth.

9. In a clay-tempering machine, and in combination with the traveler-shaft, the vertical shaft, and the counter-shaft, the central 30 bearing-tube having near its lower end an an-

nular groove and provided with a bearing for the vertical shaft, and with a bracket having a bearing for the counter-shaft, and the connection having at one end a bearing fitting the annular groove of the bearing-tube and 35 provided with a bearing for the traveler-shaft, substantially as set forth.

10. In a clay-tempering machine, the combination, with the tempering-wheel shaft and the traveler, of the collar encircling the wheel- 40 shaft and provided with a set-screw, whereby it may be fixed thereto, and the pitman having one end connected with the traveler and its other end detachably joined to the collar of the wheel-shaft, substantially as and for the 45 purposes specified.

11. The combination, with the framing and the vertical and traveler shafts, of the bearing-tube encircling the vertical shaft, and having annular groove 12, flange 10, and bracket 50 H, having bearing 11, the standard, the counter-shaft journaled in bearing 11 and the standard, and suitable gears connecting the counter, vertical, and traveler shafts, substantially as and for the purposes specified.

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Witnesses:

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