Feb. 20, 1934. H. E. BOUGHTON 1,948,328

ROLL MACHINE FOR PREPARING FOUNDRY SAND

Filed Dec. 8, 1930 3 Sheets-Sheet 1

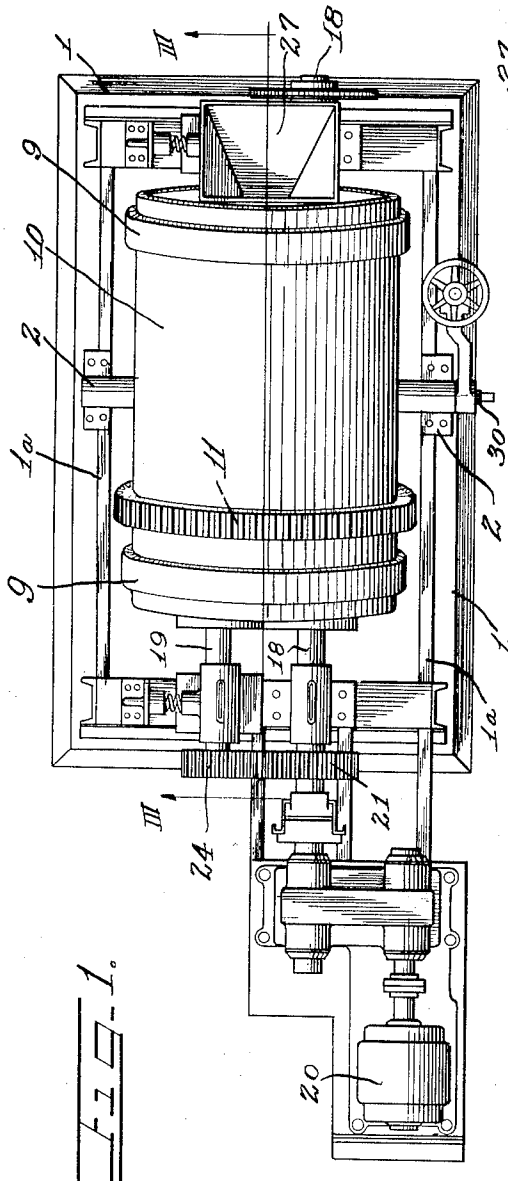


FIG. 1.

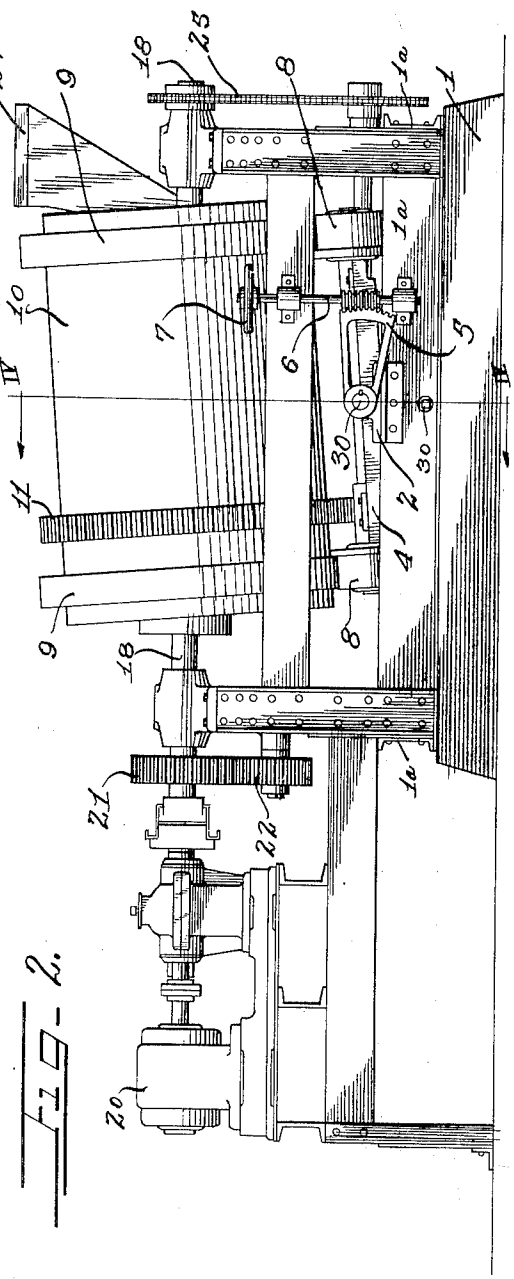


FIG. 2.

Inventor
Harry E. Boughton.
Charles W. Fillo
by Attys.

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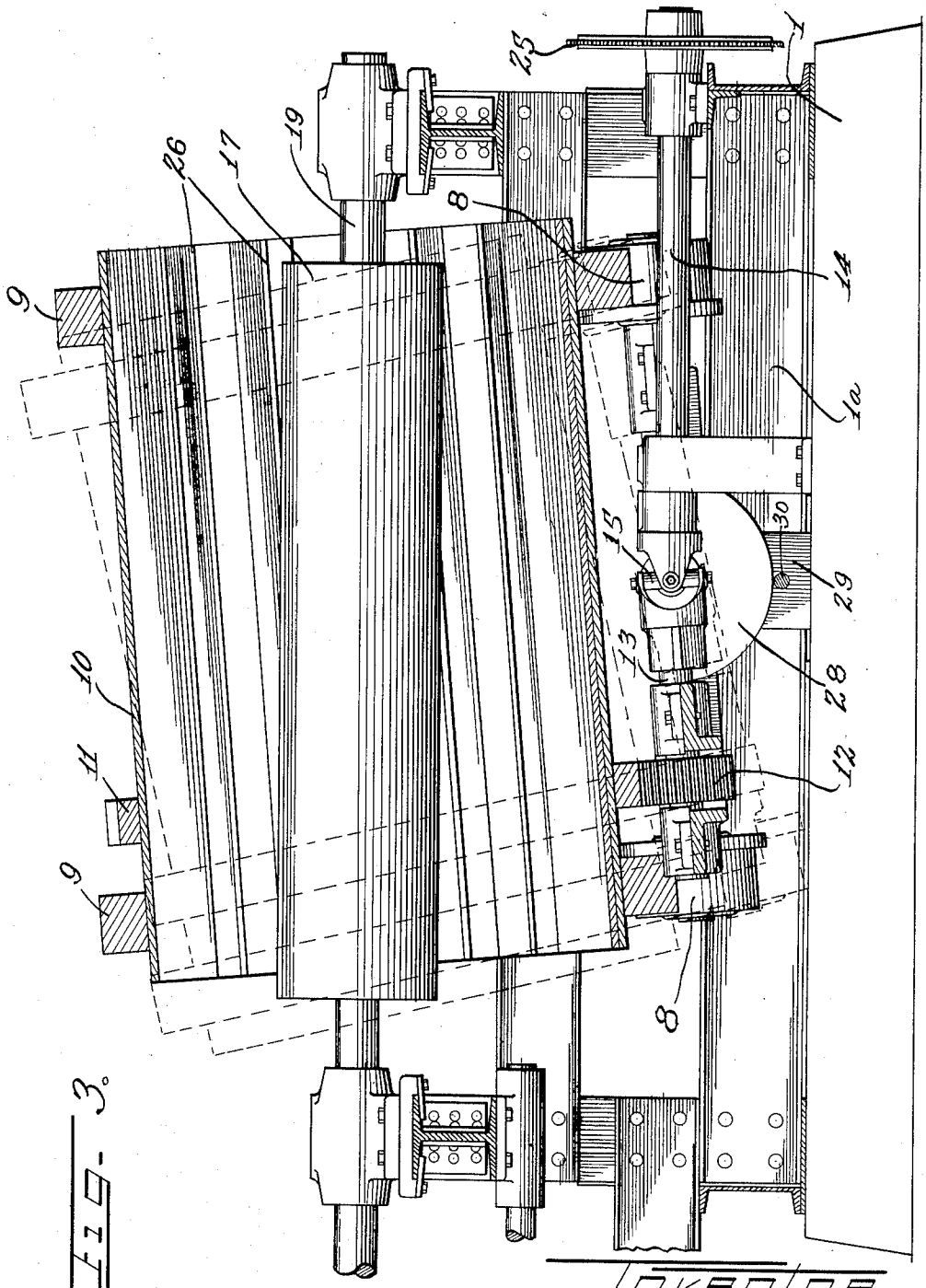


Fig. 3.

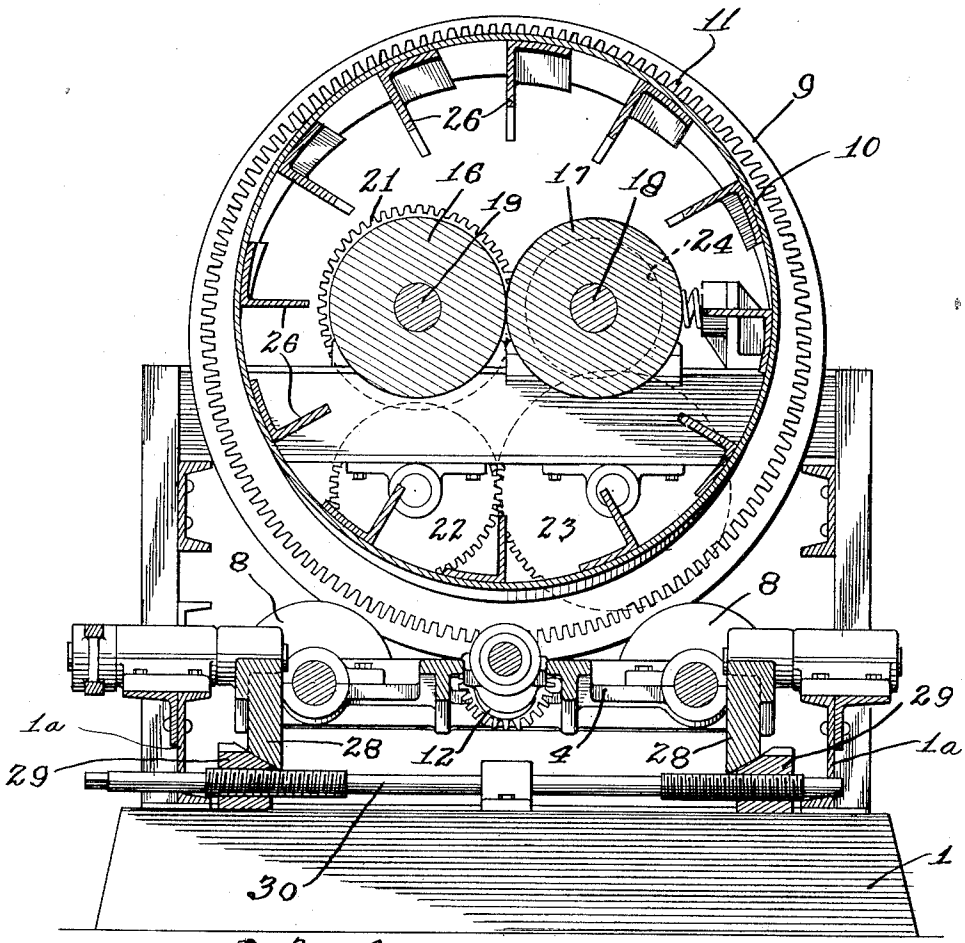
Inventor
Harry E. Boughton.
by Charles W. Hill
Attys.

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ROLL MACHINE FOR PREPARING FOUNDRY SAND

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Fig. 4.



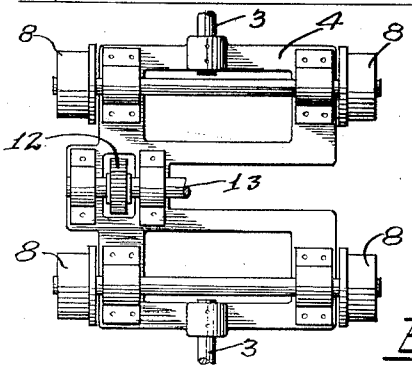


Fig. 5.

Inventor
Harry E. Boughton.
By: Charles W. Hills
Attys.

Patented Feb. 20, 1934 1,948,328

UNITED STATES PATENT OFFICE

1,948,328

ROLL MACHINE FOR PREPARING FOUNDRY SAND

Harry E. Boughton, Lakewood, Ohio, assignor to The Standard Sand & Machine Company, Chicago, Ill., a corporation of Ohio

Application December 8, 1930. Serial No. 500,745

3 Claims. (Cl. 83—12)

This invention relates to a roll machine for preparing sand for foundry purposes and concerns itself with a pair of rolls having different rates of speed between which the sand may be passed a varying number of times in accordance with the inclination of the sand carrying drum.

The invention comprises the novel structure and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawings which illustrate a preferred form of this invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is a top plan of a machine involving this invention.

Figure 2 is a side elevational view of the machine.

Figure 3 is an enlarged central sectional view through the revolving drum showing parts in elevation.

Figure 4 is a transverse sectional view taken upon the line IV—IV of Figure 2 looking in the direction of the arrows.

Figure 5 is a plan view of the cradle or supporting frame for the revolving cylinder.

In referring now to the drawings, there is shown a stationary base 1 including the upright channel members 1*a* which form an interior box-like structure. Upon the side channel members 1*a* are secured suitable bearings 2 in which short stub-shafts 3 are journalled. The inner ends of the stub-shafts 3 are secured to a tiltable cradle 4 which is clearly shown in Figure 5. Upon the outer end of one stub-shaft 3 there is secured a rack segment 5 which meshes with a vertical worm shaft 6 journalled in suitable brackets upon the frame of the machine and having a handwheel 7 thereon whereby the same may be manually rotated. It will be obvious that by rotating the shaft 6 in one direction or the other, the cradle 4 may be tilted as desired.

Two pairs of flange rollers 8 are journalled in the cradle 4 and these rollers engage suitable circular bearing tracks 9 which are secured upon a rotating drum 10. These rollers 8 are so spaced as to form a support for the drum 10 upon the tiltable cradle 4. The drum 10 is adapted to be rotated by means of an external annular gear 11 which surrounds the same and which meshes with a small gear 12 (Figure 3) secured upon a shaft section 13 which is journalled upon the cradle and which is connected to a shaft section 14 by means of a universal or Gimbel joint 15 preferably located substantially in the pivotal axis of the cradle. Within the drum, there are located a pair of cooperating rolls 16 and 17 which are respectively mounted upon shafts 18 and 19 which are suitably journalled in bearings carried by a super-frame structure rising from the base 1.

In referring to Figure 3, it will be noted that the ends of the drum 10 are open so that the shafts 18 and 19 can readily extend therethrough. Upon a suitable stand at one end of the base 1 there is mounted a motor 20 which is geared in any suitable way to the shaft 18. This shaft 18 carries a gear 21 which is located beyond the super-frame structure and this gear 21 meshes with an idler gear 22 which is located therebeneath as shown in Figures 2 and 4. The idler gear 22 meshes with a larger gear 23 which is also an idler gear and which meshes with a gear 24 secured upon the shaft of the roll 17. It will be noted that the gear 22 is substantially the same size as the gear 21 whereas the gear 23 is considerably larger than the gear 22. Likewise, the gear 24 is smaller than the gear 21 with the result that the roll 17 will be driven at a higher rate of speed than the roll 16 so as to produce a rubbing action on the sand that passes between the rolls and helps to distribute the bond on the individual sand grains. The shaft 18 is connected by suitable sprocket gearings 25 to the aforementioned shaft 14 which rotates the drum or cylinder 10.

The interior of the drum or cylinder 10 is provided with a plurality of longitudinally extending lifting shelves 26 which are adapted to carry the sand upwardly and discharge the same above the rolls 16 and 17 whereby the same may be passed between the rolls for mixing the same. At the rear end of the cylinder 10 there is located a suitable hopper 27 by means of which the sand may be fed into the cylinder 10.

The aforementioned cradle 4 is adapted to be maintained in its adjusted position according to an arrangement shown in Figure 4. To this end, it will be noted that a pair of depending members 28 having sloping surfaces are embodied in the cradle and these depending members 28 are adapted to coact with slidable wedge members 29 mounted upon the base 1 and adapted to be operated by a screw shaft 30 having the right and left handed threaded portions for engaging the wedge blocks 29. By rotating the screw shaft 30, the wedge blocks 29 may be shifted further apart or brought closer together in accordance with the tilted position of the cradle.

It will of course be understood that the sand

will travel more quickly through the cylinder when the same is at a speed inclination than when the same is at a more shallow inclination. The inclination, therefore, will govern the number of times that the sand is forced to pass between the rolls 16 and 17.

In the operation of the machine, the cylinder will, of course, be rotated and the sand will be charged into the cylinder through the hopper 27. The sand entering the hopper will naturally descend to the bottom of the cylinder and be carried upwardly by the lifting shelves 26 which will discharge the same between the rolls 16 and 17. After the sand has passed between the rolls 16 and 17, it will again be carried upwardly by the shelves 26 and again deposited between the rolls 16 and 17 and so on until it is passed outwardly at the other end of the cylinder due to the inclination of the cylinder which gradually causes the sand to gravitate towards the discharging end thereof, which is, of course, located at the lower end of the cylinder. Now if the cylinder is given only a small inclination, the sand will gravitate therethrough very slowly with the result that it will be passed a large number of times between the rolls 16 and 17 for treatment, whereas, on the other hand, if the cylinder is given a rather steep inclination, the sand will gravitate therethrough more quickly and will pass through the rolls 16 and 17 a fewer number of times. Consequently, sand requiring a good deal of treatment may be passed through the rolls a larger number of times, while sand that requires only a limited treatment may be passed through the rolls a fewer number of times.

From the foregoing, it will be apparent that a novel machine has been provided for preparing sand for foundry purposes and which machine may be so regulated as to treat the sand according to the requirement thereof. It will also be appreciated that due to the fact that the mixing rolls 16 and 17 rotate in opposite directions at different rates of speed, the sand will be given a rubbing action whenever it is passed between the rolls. It will also be noted that the cylinder 10 is fairly long so that considerable time may be required for the sand to pass therethrough with the result that the same will be thoroughly mixed before passing therethrough.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than is necessitated by the prior art.

I claim as my invention:

1. In a mixing machine, a longitudinally extending base, a cradle having laterally extending trunnions journaled upon said base, a mixing drum supported upon said cradle, means for tilting said cradle, downwardly extending members having sloping lower ends upon said cradle, wedges mounted upon said base and engaging said sloping ends and means for simultaneously actuating said wedges for sustaining said cradle in tilted position.

2. In a mixing machine, a stationary base, a tiltable cradle having laterally extending trunnions journaled upon said base, a mixing drum mounted on said cradle, wedges between said base and cradle for maintaining said cradle in tilted position, a pair of coacting rollers in said drum, said rollers having shafts journaled upon said base and means for tilting said cradle and drum relative to said rollers.

3. In a mixing machine, a stationary base, a cradle having trunnions journaled upon said base, a mixing drum mounted upon said cradle, rollers journaled upon said base and located in said drum and means for tilting said cradle and drum relative to said rollers.

HARRY E. BOUGHTON.