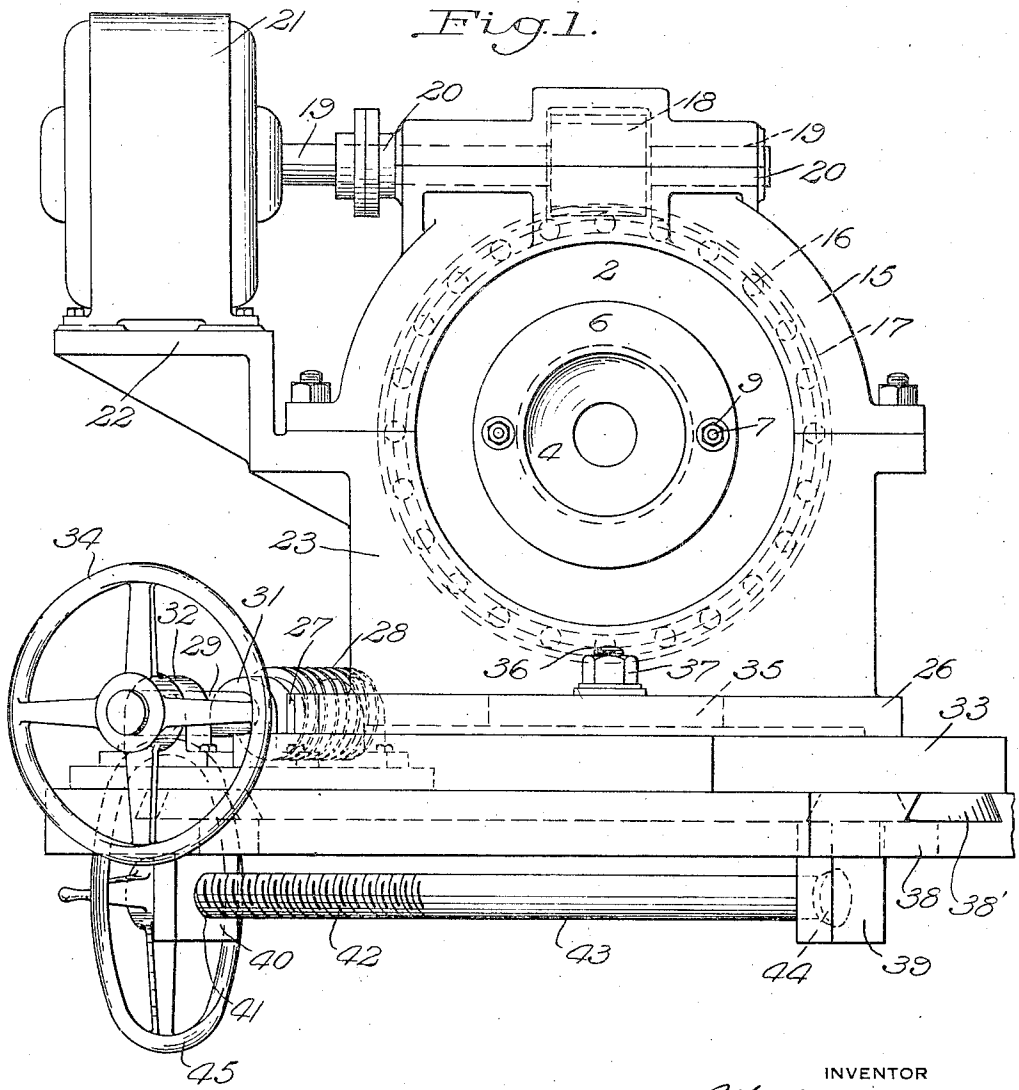
Oct. 16, 1934. P. B. ABRAMSEN 1,977,223

APPARATUS FOR FINISHING TUBES AND ROUNDS

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Fig. 1.



INVENTOR

Peter B. Abramsen

By Byron, Stebbins, Parmelee & Blenko

Attorneys

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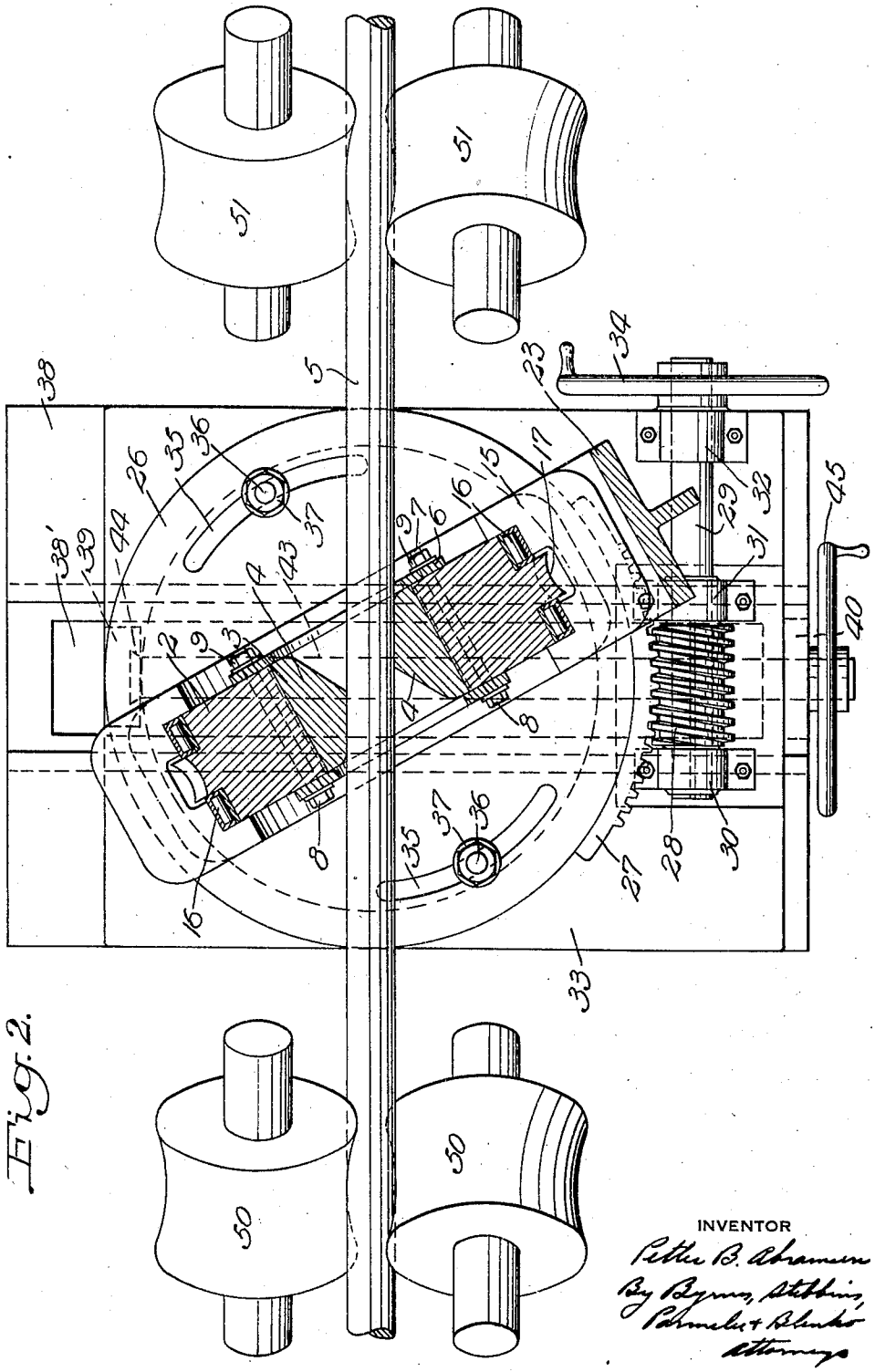


Fig. 2.

INVENTOR
Peter B. Abramsen
By Byron, Stebbins, Pahmeier & Blenko
Attorneys

Oct. 16, 1934. P. B. ABRAMSEN 1,977,223

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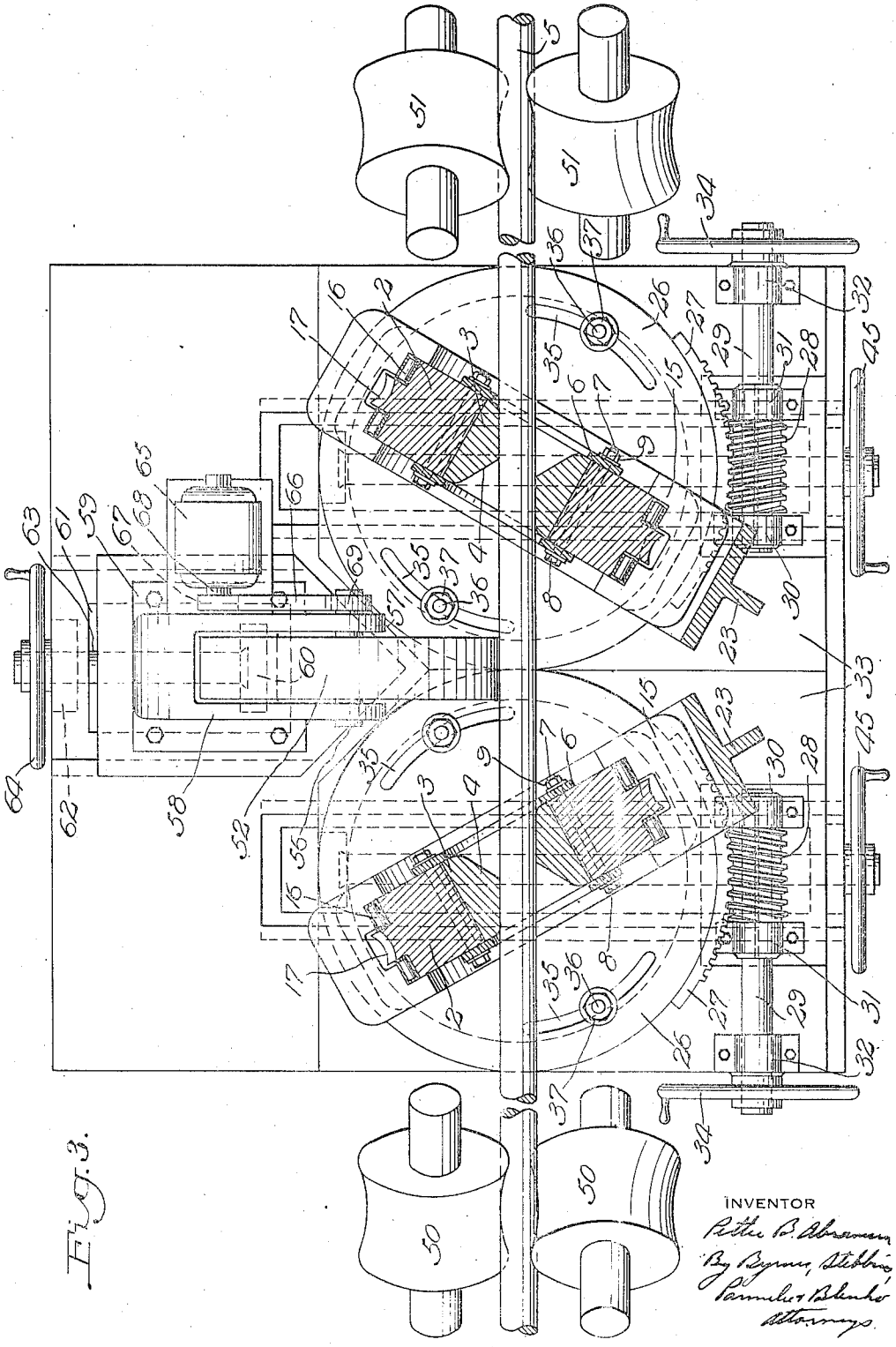


Fig. 3.

INVENTOR

Peter B. Abramsen

By Byron, Stubbs

Parmelee & Blanke

Attorneys

Patented Oct. 16, 1934 1,977,223

UNITED STATES PATENT OFFICE

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APPARATUS FOR FINISHING TUBES AND ROUNDS

Petter B. Abramsen, Dormont, Pa.

Application September 15, 1931, Serial No. 562,859

4 Claims. (Cl. 80—13)

My invention relates generally to the finishing of tubes and rounds and, more particularly, to the straightening, sizing and surfacing of the tubes and rounds after they have been formed.

By my invention I provide a hollow roll having an internal surface or a plurality of internal surfaces adapted to engage the material to be finished. I further provide complete apparatus for the finishing of tubes or rounds which comprises the combination of a hollow roll or a plurality of hollow rolls of the above character with cross rolls, and with apparatus suitable for grinding the surface of the tube or round.

In the drawings, I have shown for purposes of illustration only, a preferred embodiment and one modification of my invention. It is to be understood, however, that the invention may be otherwise embodied without departing from the spirit and scope thereof.

In the drawings,

Figure 1 is an end elevational view showing the hollow roll, its mounting and driving means;

Figure 2 is a horizontal cross sectional view through the center of the apparatus shown in Figure 1, showing it in combination with cross rolls and a round being treated; and

Figure 3 is a view similar to Figure 2 showing a modification of my invention.

In the apparatus shown in the drawings, with particular reference to Figures 1 and 2, there is a hollow roll indicated generally by the reference character 2. The hollow roll 2 has an inner portion 3 having thereon a plurality of inner material engaging surfaces 4. The material engaging surfaces 4 constantly decrease in diameter toward the center of the roll. The material engaging surfaces 4 may also be described as being the surfaces generated by revolving a cylinder about a point on its own axis at a constant angle of generation. The surfaces 4 may also be described as being formed by placing together the small ends of two truncated cones. This shape is preferable for the reason that when the roll is inclined to the axis of a bar 5, the bar will be engaged on opposite sides thereof by both faces of the roll.

The inner portion 3 is preferably made of tool steel so as to provide a hard surface for straightening or polishing the bars or tubes. The inner portions 3 may be made integral with the balance of the roll, or, as shown in the drawings, may be made removable so that they can be readily replaced. The inner portions 3 are held in position in the roll by means of circular plates 6, which are held in position on each side of the roll by means of bolts 7 having heads 8 and nuts 9 thereon.

The roll 2 is mounted in a bearing 15 on rollers 16. An annular rack 17 is provided on the periphery of the roll so that it may be driven. A worm gear 18 is adapted to engage the rack 17 for driving the roll. The worm gear 18 is mounted on a shaft 19 carried in bearings 20 and is driven by a motor 21. The motor 21 may be mounted in any desired position, such as on a platform 22 carried by the roll housing 23, which also carries the bearing 15 for the roll 2.

The housing 23 is mounted on a base plate 26. The base plate 26 carries a rack 27 on one side thereof, which rack is adapted to engage the worm wheel 28 on the shaft 29 which is mounted in bearings 30, 31 and 32, which are carried by the main base plate 33 and on which main base plate the base 26 is rotatably mounted. A hand wheel 34 is mounted on and keyed to the shaft 29. Rotation of the shaft will rotate the base plate 26 relative to the main base plate 33, so as to change the angle of inclination between the roll 2 and the bar 5. Slots 35 are provided in the base 26 on which the roll housing is mounted. These slots are adapted to receive bolts 36, which bolts pass through the main base plate 33 and are adapted to receive nuts 37 for holding the base plate 26 in any adjusted position.

The main base plate 33 is mounted on the supporting plate 38, which has an elongated slot 38' therein. The main base plate 33 carries a lug 39 which is adapted to extend downwardly through the opening 38 in the supporting plate 38. The supporting plate 38 carries a downwardly projecting lug 40 having a threaded opening 41 therein. The threaded opening 41 is adapted to receive the threaded portion 42 of a shaft 43. The one end of the shaft 43 is fixedly mounted in the lug 39 as at 44. The other end of the shaft 43 carries a hand wheel 45. Rotation of the hand wheel will cause the main base plate 33 to be carried along the supporting plate 38 in a direction laterally of the bar 5.

As may be seen, the roll by the above-described mechanism is rendered adjustable laterally of the direction of travel of the material and the angle of inclination relative to the bar or round made adjustable.

The roll just described may be used in combination with cross rolls 50 for feeding the material to the straightening or polishing roll, and in combination with cross rolls 51 for delivering the bars from the hollow roll.

In Figure 3, I have shown a plurality of hollow

rolls 2 in combination with feed rolls 50, delivery rolls 51 and an emery wheel 52. The emery wheel 52 may be used for grinding the surface of the bar 5 so as to remove therefrom any pit markings. In this embodiment, the base plates 33 are mounted on a large supporting plate 55 which has openings therein similar to the opening 38' shown in Figures 1 and 2, and the rolls 2 are rendered adjustable laterally of the material in the manner described above with reference to Figures 1 and 2.

The emery wheel is supported on a shaft 56 mounted in bearings 57 on the upwardly extending arms 58 which are supported by a plate 59. The plate 59 is carried by the supporting plate 55. The plate 59 has a downwardly extending lug 60 which is adapted to extend through the opening 61 in the supporting plate 55. The supporting plate 55 has a downwardly projecting lug 62. The lug 62 is threaded to receive the threaded portion of the shaft 63. One end of the shaft 63 is fastened to the downwardly projecting lug 60 on the base plate 59, and the other end has mounted thereon and keyed thereto a hand wheel 64. The rotation of the hand wheel 64 will serve to adjust the grinding wheel 52 laterally of the machine.

The grinding wheel 52 may be driven by means of a motor 65 through a belt 66 which passes over a wheel 67 carried by the motor shaft 68 and over a wheel 69 carried by the shaft 56.

In the embodiment shown in Figure 3, the hollow rolls 2 are made adjustable laterally of the machine and the inclination thereof adjustable in the manner described with reference to the embodiment shown in Figures 1 and 2. The roll 2 adjacent the feed rolls will be valuable for straightening the rod being fed through the machine. After the rod passes through the straightening roll, it then passes the grinding wheel 52 which removes pit markings which are characteristic of hot rolled rounds, and also serves to reduce the size of the round 5 to the desired size. The hollow roll 2 which is located adjacent the delivery rolls 51 may be used for polishing the bars or tubes being fed through the machine.

As may be readily seen, the apparatus which I provide is very effectual for the finishing of tubes and rounds. A single hollow roll may be used in combination with a plurality of cross rolls or any desired number of hollow rolls may be used in combination with the cross rolls and in combination with a grinding wheel for removing markings from the material, and for grinding it to the proper size. Any desired number of hollow rolls may be used to accomplish the purpose desired.

While I have shown and described a preferred embodiment and one modification of my invention, it is to be understood that it may be otherwise embodied within the scope of the appended claims.

I claim:

1. In apparatus for finishing tubes or rounds, a hollow roll having two inner adjacent material engaging surfaces in the form of truncated cones with the small ends thereof adjacent each other, said roll being inclined to the axis of the material being rolled to an extent sufficient to bring the material engaging surfaces into contact with the material on opposite sides thereof simultaneously.

2. In apparatus for finishing tubes or rounds, a hollow roll having two inner adjacent material engaging surfaces in the form of truncated cones with the small ends thereof adjacent each other, said roll being inclined to the axis of the material being rolled to an extent sufficient to bring the material engaging surfaces into contact with the material on opposite sides thereof simultaneously, and means for driving the roll.

3. In apparatus for finishing tubes or rounds, a hollow roll having two inner adjacent material engaging surfaces in the form of truncated cones with the small ends thereof adjacent each other, said roll being inclined to the axis of the material being rolled to an extent sufficient to bring the material engaging surfaces into contact with the material on opposite sides thereof simultaneously, means for driving the roll, and means for adjusting the inclination of the roll.

4. In apparatus for finishing tubes or rounds, a hollow roll having two inner adjacent material engaging surfaces, each of said material engaging surfaces being in the form of a frustum of a cone, the small ends of each frustum being adjacent to each other, and means for driving the roll, the said roll being disposed at sufficient angle to the longitudinal axis of the material passing therethrough to cause the material engaging surfaces to simultaneously engage opposite sides of the material.

PETTER B. ABRAMSEN.