

984,753.

Patented Feb. 21, 1911.

2 SHEETS—SHEET 1.

Fig. 1

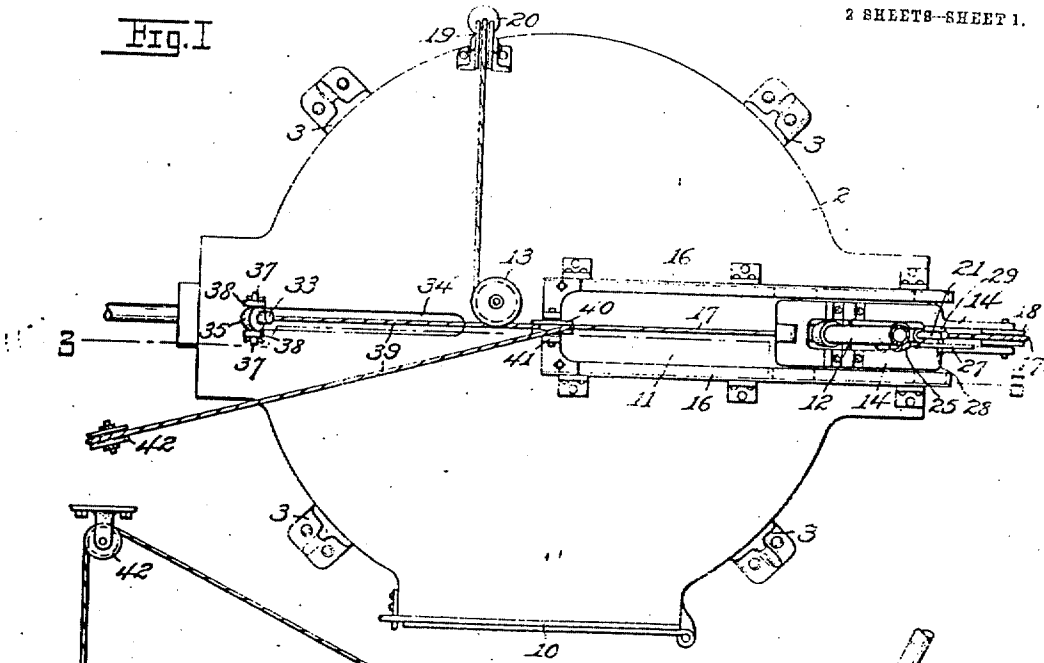
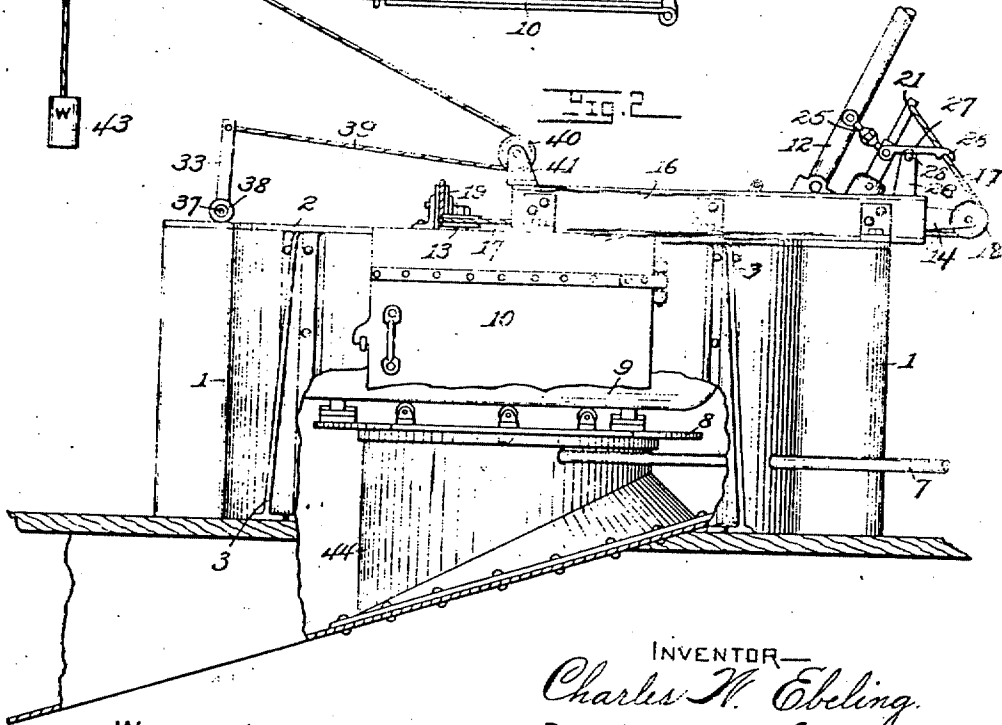


Fig. 2



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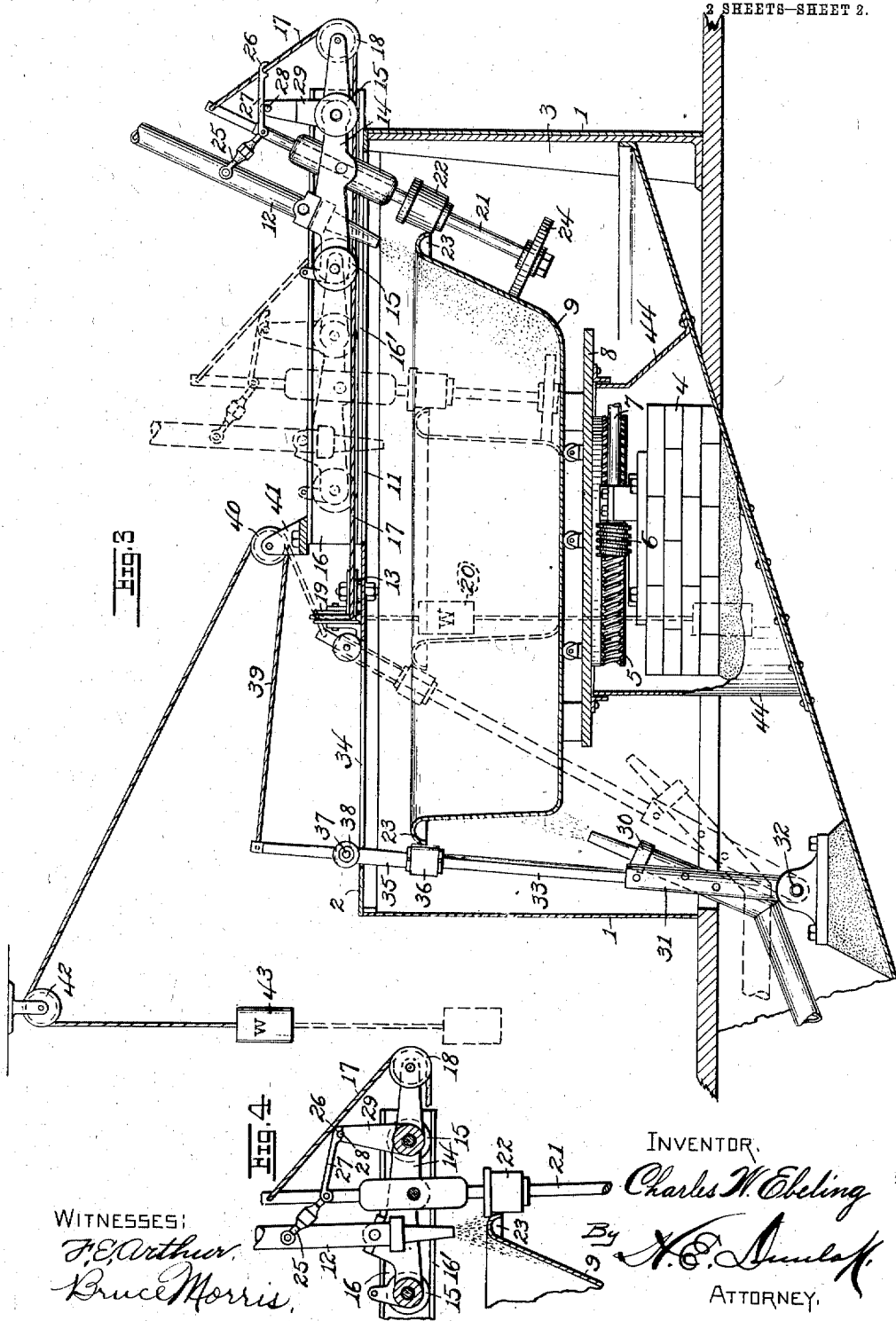
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SAND BLAST APPARATUS.
APPLICATION FILED FEB. 12, 1910.

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2 SHEETS-SHEET 2.



UNITED STATES PATENT OFFICE.

CHARLES W. EBELING, OF ELM GROVE, WEST VIRGINIA.

SAND-BLAST APPARATUS.

984,753.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed February 12, 1910. Serial No. 543,625.

To all whom it may concern:

Be it known that I, CHARLES W. EBELING, a citizen of the United States of America, and resident of Elm Grove, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Sand-Blast Apparatus, of which the following is a specification.

This invention relates broadly to sand-blast apparatus, and specifically to a device for sand-blasting metal bath-tubs and the like.

The primary object of the invention is to provide an automatically operated apparatus for smoothing the surfaces of cast-iron bath-tubs, removing the roughness and unevenness, and also removing the dust and sand which adhere to the surface of the tub after the latter is removed from the sand in which it is cast, rendering said surfaces suitable for receiving an enamel or other surface coating or finish.

A further object is to provide a sand-blast apparatus in which the article treated is rotated so as to present within the range of the blast-nozzles the entire surface of the article.

A still further object of the invention is to provide, in an apparatus of the character mentioned, blast-nozzles having means associated therewith whereby said nozzles are caused to automatically vary their positions as the article acted upon rotates, so that in a complete revolution of said article the entire surface thereof will be subjected to the abrading blasts from said nozzles.

Other important objects will be in part apparent and in part explained hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will hereinafter be exemplified and fully described, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top plan view of the invention; Fig. 2 is a side elevation of the same, a portion of the casing-wall being broken away; Fig. 3 is an enlarged section on the line 3—3, Fig. 1; and Fig. 4 is a longitudinal

section of the carriage on which the upper blast-nozzle is mounted, the latter being shown in the position assumed in blasting the top of the rim of a bath-tub.

Referring to said drawings, in which like reference characters designate like parts throughout the several views—1 indicates a casing or inclosing wall, preferably of substantially circular form and having an overlying top or cover 2, said wall being supported by suitably-located posts 3. Located centrally within the inclosure constituted by said wall 1 is a suitable base or foundation 4 upon which is rotatably mounted a gear-wheel 5 which meshes with a worm 6 carried by a drive-shaft 7, and overlying said gear-wheel and rotatable therewith is a supporting table 8 adapted for receiving thereon a bath-tub 9 or other article to be acted upon, said article being admitted to the interior of the inclosure through a suitable door 10 provided in the wall 1.

In the top or cover 2 is provided a longitudinal slot or opening 11 in which a blast nozzle 12 is adapted to move when so actuated, said nozzle being pivotally mounted upon a movable carriage consisting of connected side members 14 mounted upon wheels or rollers 15 which travel upon the inner base flanges 16 of parallel guide-bars 16 located on opposite sides of said opening 11.

A cable 17, which is passed over a pulley 18 journaled in the rear end of the carriage, thence around a sheave 13 mounted horizontally at a point in front of the opening 11, and thence over a pulley 19 located adjacent to the edge of the top of the casing 1, bears upon its free end a suspended weight 20 and has its opposite ends attached to the upper end of a rod 21 which is pivotally mounted upon said carriage in the rear of the nozzle 12 and which stands substantially parallel to said blast-nozzle. Said rod has a sleeve or roller 22 rotatable thereon adapted for engaging the flange or rim of the tub 9, and has on its lower end a disk-roller 24 adapted for engaging the body of the tub, as shown.

A brace-rod 25, preferably having a turn-buckle adjustment, is pivotally connected at

its opposite ends to the blast-nozzle 12 and the rod 21 at points above their pivotal mountings, whereby the relative positions or inclinations of said nozzle and rod are maintained; that is, when the rod is caused to assume different positions or inclinations, the nozzle is automatically caused to assume like, or substantially parallel, positions or inclinations.

10 Now, as will be apparent, rotary motion communicated to the table 8 through the drive-shaft and gears causes the table to rotate, carrying the tub mounted thereon. Owing to the rearwardly and downwardly directed stress placed upon the upper end of the rod 21 through the cable 17, said rod is rocked back and forth on its pivotal mountings as said tub is rotated, the sleeve or roller 22 and the disk-roller 24 being at all times maintained in contact, or operative engagement, with the flange or rim 23 and body, respectively, of said tub. In addition to the rocking movement of the rod 21 which occurs during the rotation of the tub, the carriage is caused to move back and forth along the runway constituted by the flanged guide-bars 16, the weight 20 upon the free end of the cable passed over pulley 18 serving to normally maintain the carriage in a forwardly-thrust position with the roller 22 in engagement with the rim 23, and the tub, as it approaches, in its rotation, a position in parallel alinement with the carriage, forcing said carriage rearward, the said parts moving from the positions shown in full lines in Fig. 3 to those shown in dotted lines in said figure.

The position of the mounting of the nozzle 12 upon the carriage is such with relation to that of the rod 21 that blasts therefrom will be discharged against the interior surfaces of the tub, being directed downward along the walls of the latter in such manner as to effect the abrasion of the surface presented to the blast from the top to the bottom of the tub wall. The curved form of the tub at the point where the side-walls merge or join with the bottom causes the blasts directed downward along the inclined inner surface of the walls to glance inward along the bottom of the tub and to thus effect the desired abrasion of the bottom.

When it is desired to direct a blast upon the top of the rim 23, it becomes necessary to change the positions of the nozzle 12 and the rod 21 with relation to the tub so that the former will stand substantially vertical over said rim. The adjustment of the rod and nozzle so that they will occupy vertical positions is readily effected by bringing the hook-end 26 of a rod 27, pivotally mounted upon the rod 21, into interlocking engagement with a laterally-directed pin 28 car-

ried by an upright standard 29 fixed in a stationary position on the carriage. This, as is clearly apparent, causes the disk-roller 24 to be withdrawn from engagement with the body of the tub and the other parts to assume the positions clearly shown in Fig. 4.

For blasting the exterior surface of the tub, a second blast-nozzle 30 and actuating means therefor is provided, said nozzle 30 being located in a position for directing its blasts upward in an inclined direction against the outer surface of the tub. Said nozzle is fixed between parallel members 31 which have a suitable pivotal mounting 32 and to the upper ends of which is rigidly connected the lower end of a rod 33 which extends upward through the top or cover 2 and is movable in a longitudinal slot 34 provided in said cover. Slidably mounted upon said rod 33 is a sleeve 35 having rotatable upon its lower end a roller 36 adapted for engagement with the rim 23 of the tub. Laterally directed trunnions 37 carried by the upper end of said sleeve have rollers 38 mounted thereon, said rollers being adapted to travel upon the cover 2 on opposite sides of said slot 34. As is obvious, when a swinging movement is imparted to the rod 33, the rollers 38 travel forward and backward, effecting the raising and lowering of the sleeve 35 along said rod to an extent which serves to maintain the roller 36 in engagement with the rim 23 of the tub throughout all the positions assumed by the latter in its rotation. Connected to the upper end of the rod 33 is one end of a cable 39 which is thence passed over a pulley 40 located at a suitable point beyond the inner end of said slot 34, as upon a support 41 at the front end of the runway 16, thence over a pulley 42 located at an appropriate point, and has a weight 43 suspended from its opposite or free end, as shown.

As is obvious, the weight 43 serves to maintain the upper end of the rod 33 swung inward so that the roller 36 is at all times in engagement with the rim 23 of the tub, following said rim as the tub rotates. Consequently, the blast-nozzle 30, which is rocked back and forth with the rod 33, is at all times during the rotation of the tub maintained in an effective blasting position and, in a complete revolution of the tub, subjects the entire exterior surface of the latter to its abrading blasts.

For preventing access of sand and dust to the gears, an inclosing casing 44 is provided directly below the rotating table.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A sand-blast apparatus comprising means for rotating the article acted upon, a blast-nozzle, and means associated with said

nozzle whereby the latter is caused to follow the movement of the rotated article.

2. A sand-blast apparatus comprising means for rotating the article acted upon, a blast-nozzle, and means whereby said nozzle is automatically actuated to vary its position to direct constantly effective blasts.

3. A sand-blast apparatus comprising means for rotating the article acted upon, a blast-nozzle, means for automatically actuating said nozzle to vary its angle of inclination with the variation of the angle of inclination of the parts presented within the range of its blasts, and means for reciprocating said nozzle, causing it to follow the irregular surface lines of the article.

4. The combination with an article to be acted upon having an irregular surface, of means for rotating said article, a sand-blast nozzle, means associated with said nozzle whereby it is actuated to follow the irregular surface lines of said article as the latter is rotated, and means whereby the inclination of said nozzle is varied to a degree corresponding with the inclination of the surface of the article presented to its blasts.

5. In an apparatus for sand-blasting bath-tubs, means for rotating the tub, a blast-nozzle, means associated with said nozzle whereby the latter is caused to assume varying angles of inclination corresponding to the angles of inclination of the walls of the tub presented to its blasts, and means whereby said nozzle is caused to move back and forth to maintain the walls of the tub in constant range.

6. In a sand-blasting apparatus for bath-tubs, means for rotating the tub, a movable carriage, a blast-nozzle pivotally mounted on said carriage, and means under the control of the rotating tub for moving said carriage back and forth to maintain said nozzle in constant operative relation to the walls of said tub.

7. In a sand-blast apparatus for bath-tubs, means for rotating the tub, a movable carriage, a blast-nozzle pivotally mounted on said carriage, means under the control of the rotating tub for moving said carriage back and forth to maintain said nozzle in constant operative relation to said tub, and means under the control of the tub for swinging said nozzle on its pivotal mounting to cause an equal angle of inclination to the tub walls presented thereto to be constantly maintained.

8. In a sand-blast apparatus for bath-tubs, means for rotating the tub, a movable carriage, a blast-nozzle pivotally mounted on said carriage for directing blasts against the interior walls of the tub, means controlled by the rotating tub whereby said carriage is moved to maintain the relation of said nozzle to the tub and whereby the angle of

inclination of the nozzle is varied to correspond with the variations of inclination of the tub walls presented to said nozzle, and means for simultaneously directing blasts against the exterior walls of the tub.

9. In a sand-blast apparatus for bath-tubs, means for rotating the tub, a movable carriage, a blast-nozzle pivotally mounted on said carriage for directing blasts against the interior walls of the tub, means controlled by the rotating tub whereby said carriage is moved to maintain the relation of said nozzle to the tub and whereby the angle of inclination of the nozzle is varied to correspond with the variations of inclination of the tub walls presented to said nozzle, a second nozzle adapted for directing blasts against the exterior walls of the tub, and means controlled by the rotating tub whereby the angle of inclination of the second nozzle is varied.

10. In sand-blast apparatus for bath-tubs, means for rotating a tub, a movable carriage, a blast-nozzle pivotally mounted on said carriage, a rod pivotally mounted on said carriage adjacent to said nozzle, a connecting link between said rod and said nozzle, roller bearings carried by said rod in engagement with the tub, and means for moving the carriage to maintain such engagement throughout the revolution of the tub.

11. In sand-blast apparatus for bath-tubs, means for rotating a tub, a movable carriage, a blast-nozzle pivotally mounted on said carriage, a rod pivotally mounted on said carriage adjacent to said nozzle, a connecting link between said rod and said nozzle, a pair of roller bearings carried by said rod in engagement with the tub, means for moving the carriage to maintain such engagement throughout the revolution of the tub, said bearings contacting the walls of the tub near its top and near its bottom and adapted to hold said rod substantially parallel to the part of the wall contacted, maintaining the relative inclination of the nozzle to the part of the wall presented thereto substantially constant.

12. In sand-blast apparatus for bath-tubs, means for rotating a tub, a blast-nozzle for directing blasts against the interior walls of the tub, means for varying the position of said nozzle to maintain its operative relation to the tub throughout the rotation of the latter, a blast-nozzle for directing blasts against the exterior surface of the tub, and means controlled by the rotating tub for varying the inclination of the last-mentioned nozzle to maintain its operative relation to the tub throughout the rotation of the latter.

13. In sand-blast apparatus for bath-tubs, means for rotating a tub, a blast-nozzle for directing blasts against the interior walls of

the tub, means for varying the position of
said nozzle to maintain its operative rela-
tion to the tub throughout the rotation of
the latter, a blast-nozzle for directing blasts
5 against the exterior surface of the tub, a
pivoted rod to which the last-mentioned noz-
zle is connected, and means controlled by
the rotating tub whereby said rod is actuated
to follow the walls of the tub as the latter is

rotated, maintaining said nozzle in operative 10
relation to the tub.

In testimony whereof I affix my signature
in presence of two subscribing witnesses.

CHARLES W. EBELING.

Witnesses:

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BRUCE MORRIS.