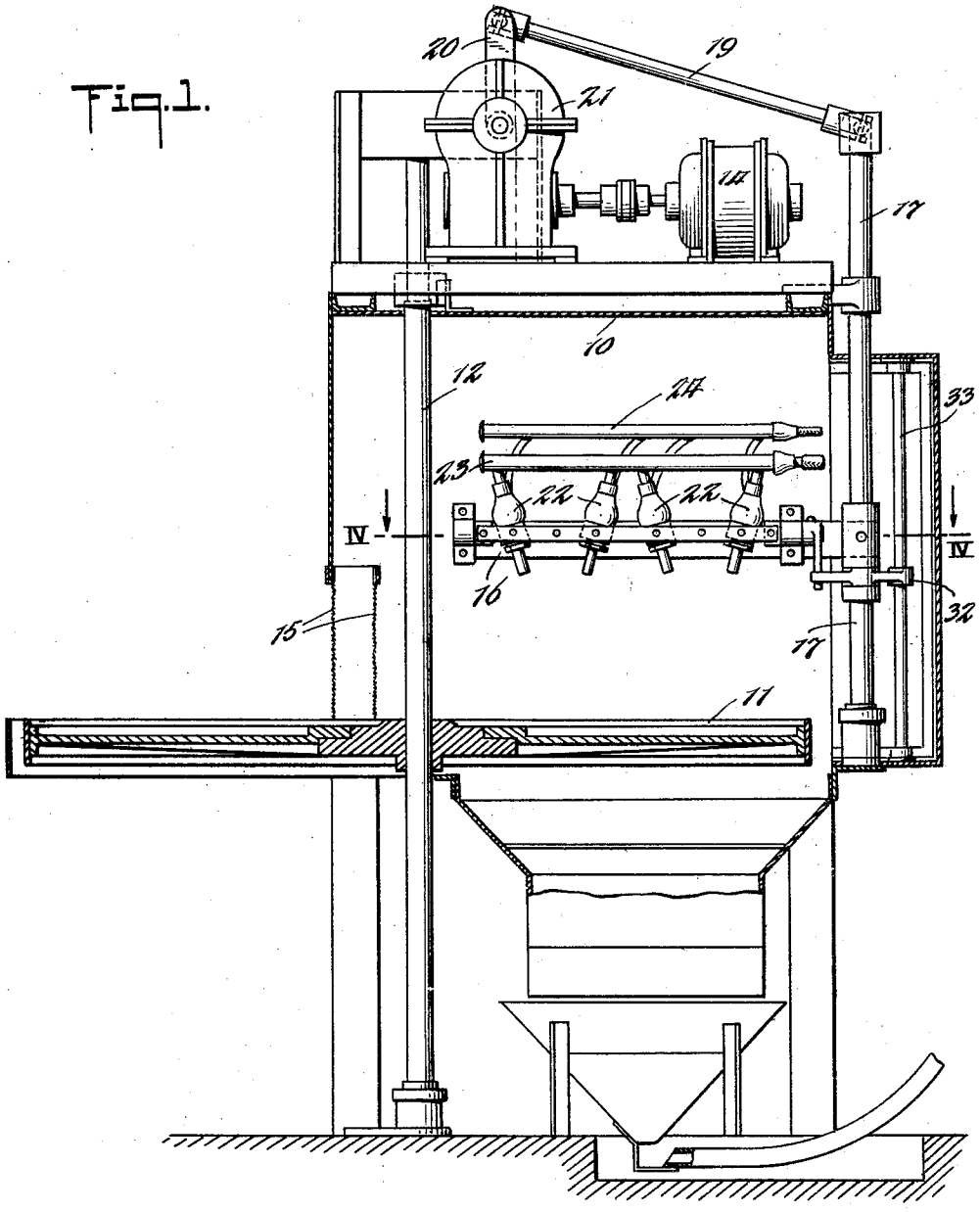
Nov. 8, 1932. C. E. BILLINGS ET AL 1,887,395

SAND BLAST APPARATUS

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Fig. 1.



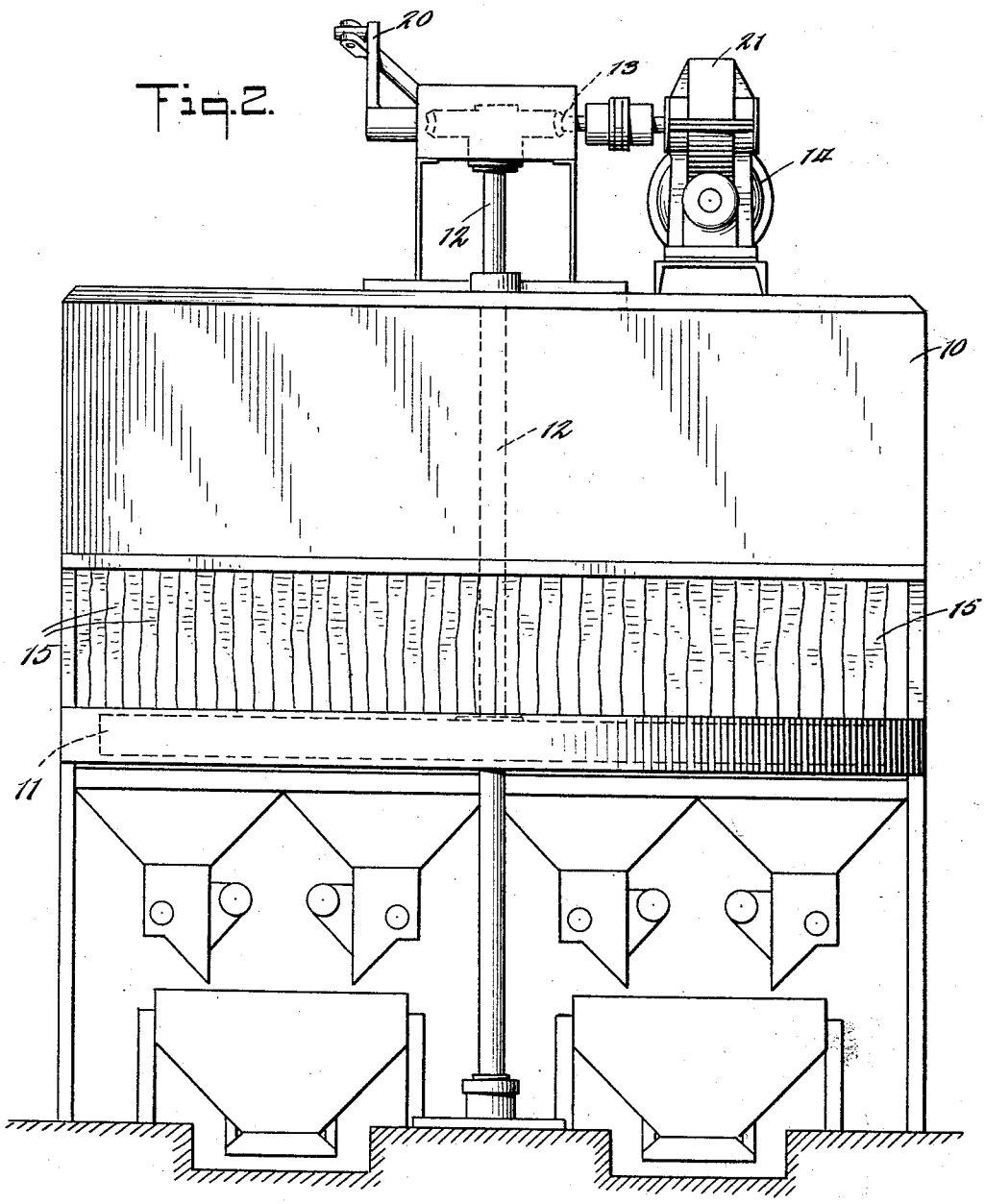
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Fig. 2.



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Fig. 3.

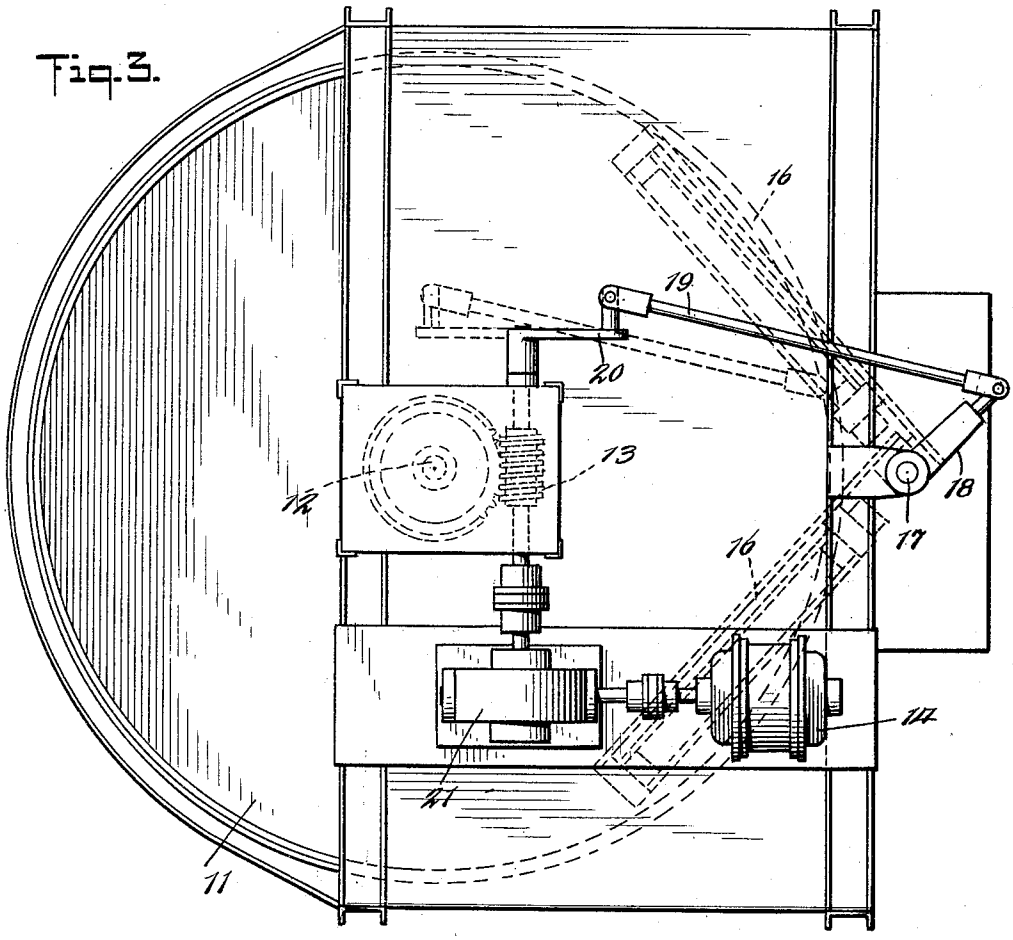


Fig. 4.

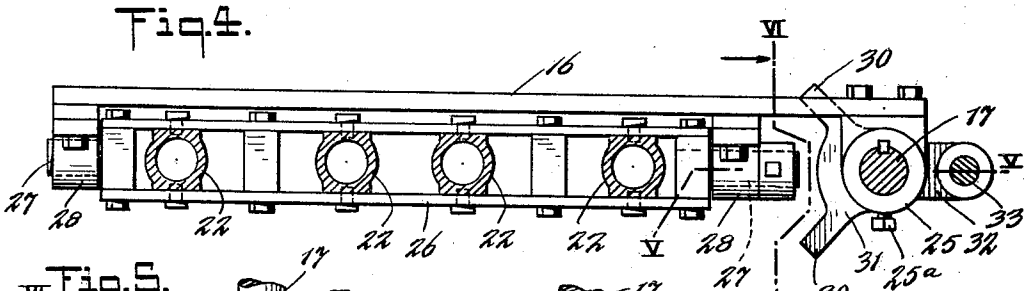
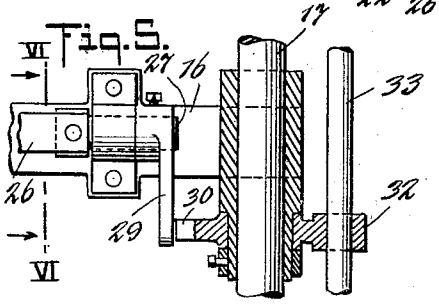


Fig. 5.



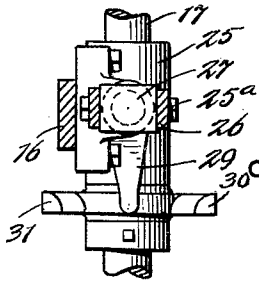


Fig. 6.

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UNITED STATES PATENT OFFICE

CLARENCE E. BILLINGS, OF NEW HAVEN, AND DONALD S. SAMMIS, OF STRATFORD, CONNECTICUT, ASSIGNORS TO THE NEW HAVEN SAND BLAST COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT

SAND BLAST APPARATUS

Application filed May 29, 1930. Serial No. 457,360.

Our invention relates to sand blast apparatus and particularly such apparatus which is designed for automatic operation to clean objects by means of a blast of sand. More especially the invention relates to that type of apparatus wherein objects to be cleaned are carried past sand blast nozzles upon a moving surface.

One object of the invention is to provide a simple, rugged and automatic apparatus which will clean the exterior of an object in efficient manner. Another object is the provision of such an apparatus which will clean as large a percentage of the exterior of an object as possible without changing the position of the object upon the surface which carries it. Other objects will appear upon consideration of the present specification.

One form of the invention is shown by way of illustration in the accompanying drawings, wherein

Figure 1 is an elevation of an apparatus constructed in accordance with the invention, certain parts being shown in section,

Fig. 2 is an elevation of the apparatus as seen from the left in Figure 1,

Fig. 3 is a plan view of the apparatus illustrated in Figure 1, certain parts being shown in different position.

Fig. 4 is an enlarged horizontal section on the line IV—IV of Figure 1 showing more clearly a part of the apparatus.

Fig. 5 is a vertical section on the line V—V of Fig. 4, and

Fig. 6 is a section on the line VI—VI of Fig. 4.

The invention comprises a sand blasting machine in which a horizontally movable arm, for instance a pivoted arm, carries nozzles, and in which means are provided for periodically changing the direction in which the nozzles point. Means may also be provided for adjusting the elevation of the arm.

In the drawings there is shown a housing 10 forming a sand blast chamber and having mounted in association therewith a rotating table 11 carried by a spindle 12 which projects through the top of the housing and is operated by a train of gears 13, which is driven by a motor 14 carried upon the housing.

The rotating table 11 projects outside of the housing 10, and a pair of curtains 15, preferably of rubber, close an opening in the housing above the table for a purpose which will now be described.

If an object is placed upon the rotating table outside of the housing, it will be carried within the housing as the table rotates and upon further rotation will be brought out of the housing again. If a sand blast is projected upon the object inside of the housing the rubber curtains will in large measure prevent the escape of sand outside of the housing, but will permit the object to enter and leave the housing as the table 11 rotates.

We provide, within the housing 10 and above the table 11, a pivoted arm 16 which may be conveniently carried by a shaft 17 extending out of and above the housing and oscillated by means of a crank 18 attached thereto. (See Fig. 3.) The shaft 17 is, of course, positioned away from the rim of the table 11 and the arm 16 is thus pivoted beyond the circumference of the table. The crank 18 comprises a collar rigid with the shaft 17 and a rotary pin therein, and is conveniently operated through a connecting rod 19 which is pivoted to a crank 20 operated by the train of gears 13. Since the motor 14 must operate at a reasonable speed in order to give proper efficiency and since the spindle 12 carrying the table 11 must rotate at a very slow speed (say ½ R. P. M.) we prefer to provide a speed reducer 21 in the train of gears 13. The table 11 rotates at a very slow speed, and the crank 18 and arm 16 at a faster speed. Thus the table 11 rotates very slowly while the arm 16 sweeps back and forth over a gradually changing portion of its surface.

Nozzles 22 are carried by the arm 16 and are fed by an air pipe 23 and a sand pipe 24 both having flexible connections in order that the arm 16 may oscillate freely. Thus, as the arm 16 oscillates across the table 11 and any object carried thereon, streams of sand may be projected downward beneath the arm.

Means may be provided for adjusting the elevation of the arm 16 above the table 11. For instance a collar 25 may carry the arm 16 and may have a set screw 25*a* therein for attaching it to the shaft 17 at any desired elevation.

We also provide means for periodically changing the angle which each nozzle makes with a vertical line through the nozzle. As here illustrated this constitutes means for changing the direction in which the nozzles point preferably at the extremes of each oscillation of the arm 16. To this end the nozzles 22 are carried in a frame 26 having a horizontal trunnion 27 at each of its ends which turns in a bearing 28 on the arm 16. A lug 29 is rigidly fastened to and projects below the frame 26 extending between the forked arms 30 of a bushing 31 carried loosely on the collar 25. An extension 32 on the bushing 31 engages and slides upon a shaft 33 which is stationary, thus the bushing 31 does not turn with the shaft 17, but maintains its position during oscillation of the shaft and arm. However, the bushing 31 is raised and lowered with the collar 25.

From the description just given it will be seen that when the arm 16 has completed its travel in one direction, the lug 29 will come in contact with one forked arm 30 and the frame 26 will be turned in such a direction that the nozzles will point generally toward the centre of the table. Upon completion of its motion in the opposite direction the lug 29 will contact with the other forked arm 30, turning the nozzles again toward the centre of the table. Thus the nozzles will always point in the direction in which the arm 16 is moving and will project sand, upon any object carried on the table, from the side instead of only from above.

Any known or convenient design of sand hoppers beneath the table, sand return apparatus, and dust cleaning arrangement may be employed.

Apparatus constructed in accordance with the present invention gives a more thorough cleaning of any object subjected to its action because the sand is projected upon more faces of that object than has been possible in the past. Furthermore the motion of the nozzles is not radially of the table, thus cleaning but two sides of the object, but by sweeping across the table several times during a revolution in an arc which cuts numerous radial lines of the table all sides of the object are effectively sand blasted.

While the present invention is here illustrated and specifically described in connection with a rotating table, it is to be understood that the invention is not limited to such a construction, but might be applied equally well where continuous belts are used, or other moving surfaces upon which an article to be cleaned may be carried. It must also be obvious that gravity sand feed or pressure sand feed might be employed. Other details of construction here specifically illustrated and described are capable of similar variation according to the desires and judgment of any one skilled in the art.

We claim:—

1. In a sand blasting machine, a rotatable table, an arm pivoted beyond the circumference of said table adapted to oscillate above said table, and nozzles carried along the length of said arm, in combination with means for changing the direction in which said nozzles point at the extremes of each oscillation.

2. In a sand blasting machine, a rotatable table, an arm pivoted beyond the circumference of said table adapted to oscillate above said table, and nozzles carried along the length of said arm, in combination with means for changing the direction in which said nozzles point at the extremes of each oscillation, and means for adjusting the elevation of said arm above said table.

3. In a sand blasting machine, a rotatable table, a casing partly inclosing said table, an arm pivoted beyond the circumference of said table adapted to oscillate above said table within said casing, and a frame having trunnions at each of its ends, said trunnions turning in bearings on said arm, in combination with nozzles carried along the length of said frame, a lug projecting beneath said frame, and a forked member adapted to contact with said lug, thus turning the frame to change the direction in which said nozzles point at the extremes of each oscillation, substantially as described.

In testimony whereof we have signed our names to this specification.

CLARENCE E. BILLINGS.
DONALD S. SAMMIS.