Dec. 4, 1923.

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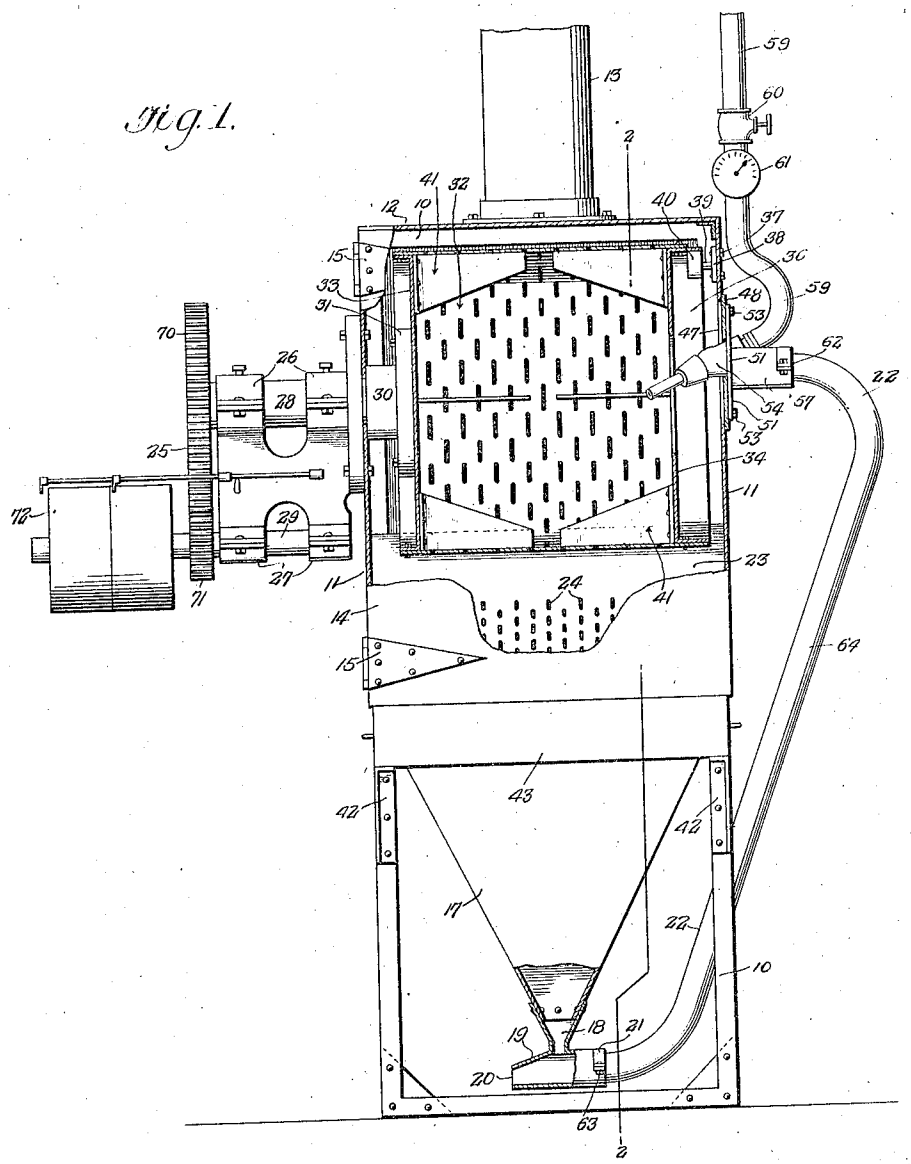
I. M. KEMP ET AL

SAND BLAST MACHINE

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Fig. 1.



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SAND BLAST MACHINE

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Fig. 2.

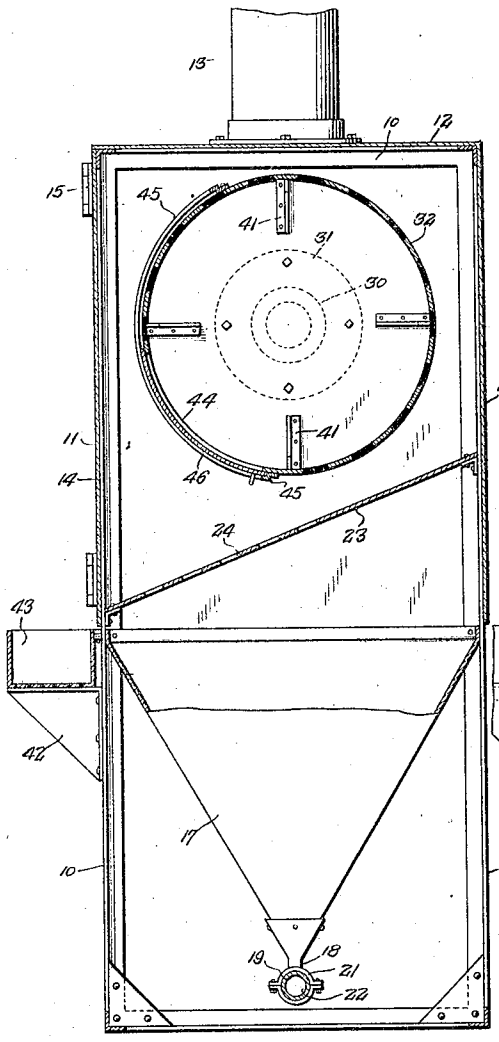
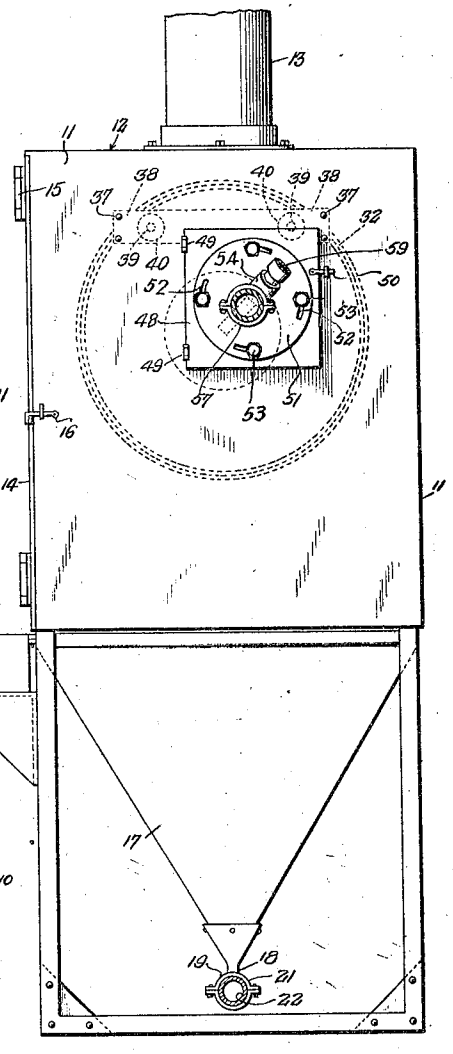


Fig. 3.



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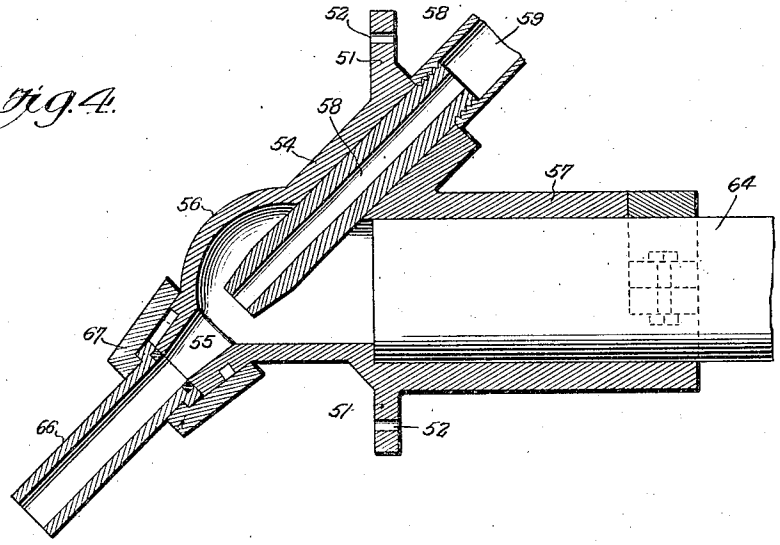
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SAND BLAST MACHINE

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Fig. 4.



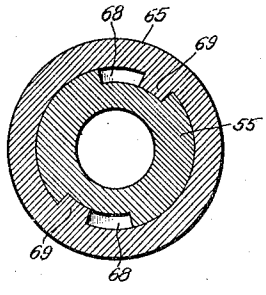


Fig. 6.

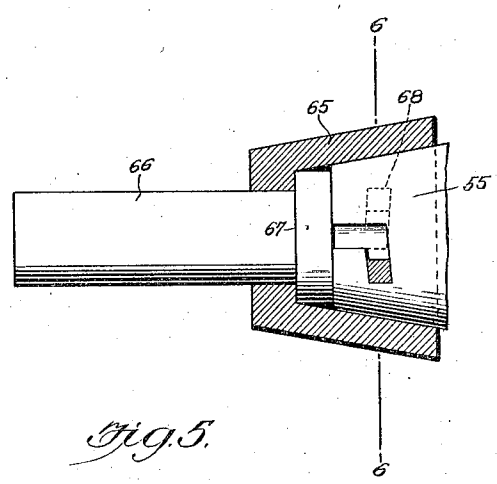


Fig. 5.

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Patented Dec. 4, 1923. 1,476,619

UNITED STATES PATENT OFFICE.

ISAAC M. KEMP AND EDWARD C. WIEDERHOLD, OF WILLIAMSPORT, MARYLAND.

SAND-BLAST MACHINE.

Application filed October 5, 1921. Serial No. 505,584.

To all whom it may concern:

Be it known that we, ISAAC M. KEMP and EDWARD C. WIEDERHOLD, citizens of the United States, residing at Williamsport, in the county of Washington and State of Maryland, have invented certain new and useful Improvements in Sand-Blast Machines, of which the following is a specification.

This invention relates to improvements in sand blast apparatus of the class wherein a rotating "barrel" is employed for containing the articles to be treated and against which the abrading medium is thrown, preferably by an air blast, and has for one of its objects to improve the construction, and increase the efficiency and utility of devices of this character.

Another object of the invention is to provide a device of this character in which provision is made for repeatedly using the abrading element.

Another object of this invention is to provide a device of this character including an improved construction of nozzle device.

With these and other objects in view the invention consists in certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims, and in the drawings illustrative of the preferred embodiment of the invention.

Figure 1 is a front elevation, partly in section, of the improved apparatus.

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is a side elevation with the return conductor detached.

Fig. 4 is an enlarged sectional detail of the nozzle device.

Fig. 5 is an enlarged sectional detail illustrating the construction of the coupling between the body of the nozzle device and the discharge nipple.

Fig. 6 is a transverse section on the line 6—6 of Fig. 5.

The improved apparatus comprises a supporting frame represented as a whole at 10 with three sides of its upper portion enclosed by imperforate walls 11, and the top 12 likewise imperforate except for a relatively large vertical flue 13, for the dust generated by the operation of the device. The fourth side of the frame opposite the imperforate walls 11 is occupied by a door 14 hingedly united as at 15 to the frame and provided with a suitable catch 16 at the edge opposite to the hinges.

Disposed within the space below the walls 11 and door 14 is a hopper shaped receptacle 17 having a contracted discharge 18 communicating with a horizontal tubular member 19, the latter having a reduced inlet 20 at one end and with means at 21 for coupling a tubular conductor 22 thereto, as shown.

Located between the walls 11 is an inclined floor 23 having perforations 24 in the lower portion, and terminating next to the bottom of the door 14, as shown in Fig. 2.

Attached to the outer face of one of the walls 11 is a bracket 25 having bearings 26 and 27 in the upper and lower parts respectively to support a main drive shaft 28 and a counter shaft 29. The shaft 28 extends through an opening in the adjacent wall 11 and carries a sleeve or collar 30 having a relatively large flange 31, the sleeve and flange being located within the casing formed by the walls 11, top 12 and door 14.

The barrel for containing the articles to be treated comprises a perforated cylinder including a body 32 one closed end 33 and the other end 34 provided with a central opening 35. The closed end 33 of the barrel is rigidly connected to the flange 31 as by clamp bolts so that the barrel rotates with the shaft 28.

The annular end or "head" 34 of the barrel is formed with a relatively wide flange 36, and attached at 37 to the adjacent wall 11 is a plate 38 carrying stub shafts 39 in spaced relation and respectively supporting bearing rollers 40 in constant contact with the inner face of the flange 36 which thus constitutes a movable track running upon the rollers. By this means an effectual support is produced for the otherwise unsupported end of the barrel, and without obstructing the opening 35.

Attached to the interior of the barrel are a plurality of blades 41 which operate as baffle members, which throw the material from side to side in the drum and expose every side of each individual piece to the action of the abrading element.

Extending from the frame members 10 just below the lower edge of the door 14, are brackets 42 to support a receptacle 43 to receive the articles after being treated in the barrel.

The cylindrical portion of the barrel is

perforated, as shown, and with an opening in one side, as indicated at 44 in Fig. 2, and attached to the drum at the sides of the opening and extending over the adjacent parts of the drum, are curved guide members 45 to receive a correspondingly curved plate 46 which thus serves as a sliding closure to the opening 44, as shown in Fig. 2.

When the contents of the drum are to be discharged, the drum is stopped in its rotary movement with the opening 44 at a relatively low point and the closures 14 and 46 opened, when the material will flow from the drum upon the inclined floor 23 and thence into the receptacle 43.

The wall member 11 next to the end 34 of the drum is provided with a relatively large opening, indicated at 47, and bearing over this opening is a combined closure and nozzle support 48, the latter hingedly coupled to the wall 11 as at 49 and provided with a suitable catch 50 to hold it in closed position.

The member 48 is provided with an intermediate aperture, and covering this aperture is a plate 51 having a plurality of curved slots 52 through each of which a clamp bolt 53 extends and is tapped into the closure member 48. By this means the plate 51 is rotatively adjustable upon the closure member 48.

Formed integral with the member 51 is a nozzle device comprising an inclined shell 54 with the inner end reduced and tapered, as shown at 55. The shell 54 is enlarged intermediate the ends as shown at 56 to form a gathering chamber, and leading into the chamber portion is a lateral branch 57.

Fitting in the bore of the shell 54 at its outer part is a conductor tube 58 for the compressed air and to whose outer end the air conductor hose 59 is connected, the hose having a controlling valve 60 and pressure gage 61 of conventional form.

Connected at its ends at 62 and 63 to the members 57 and 19 is a conductor tube 64. Bearing upon the tapered terminal 55 of the shell 54 of the nozzle device, is a correspondingly tapered sleeve or collar 65, and fitting within the collar is a smaller tube 66 enlarged at the inner end as shown at 67 to form a stop flange to prevent its removal.

The tapered portion 55 of the shell is provided with obliquely directed bayonet slots 68, while the sleeve member 65 is provided with inwardly directed studs or pins 69 to engage in the slots. By this means the member 66 may be very quickly and readily detached and replaced when worn.

The discharge tubes 66 being exposed to the full force of the blast, wear out very rapidly and require frequent renewal, and the simply constructed device enables this renewal to be easily and quickly accomplished by releasing the member 48 and swinging it into open position carrying the whole nozzle device with it, and disposing the member 66 in convenient position for removal and to enable an unimpaired tube to be attached to the portion 55.

The inner terminal of the conductor 58 is spaced a short distance only from the tapered portion 55 of the shell, and in the path of the hose member 64, the parts combining to produce an effectual blast nozzle whereby the abrading element is forcibly driven through the small tube 66 with great force and against the slowly revolving contents of the barrel.

The shell 54 is so constructed that the discharge member 66 points downwardly at about 45 degrees and laterally at about 35 degrees toward the front or discharge side of the drum. By this means the abrading medium is thrown to the center of the barrel, and after its action on the material passes through the perforations in the barrel and falls upon the inclined floor 23 and through the perforations therein into the hopper 17 and is sucked therefrom through the hose 64 and into the nozzle again where it is used over again, and so on so long as it possesses any "life."

The curved slots 52 enable the nozzle device to be adjusted as required, to control the position of the discharge end of the tube 66.

The shafts 28 and 29 are provided with intermeshing gears 70 and 71, while the shaft 29 is also provided with operating pulleys 72 of the usual construction.

By this means the necessary rotation of the barrel is accomplished.

The improved device is designed more particularly for subjecting relatively small metal castings to the action of a blast of an abrading element, such as sharp sand, for the purpose of burnishing them and removing burrs and sharp corners, and to effectually clean such articles, and may be constructed of any size or capacity and of any suitable material.

The preferred embodiment of the invention is disclosed in the drawings and set forth in the specification, but it will be understood that modifications within the scope of the claimed invention may be made in the construction without departing from the principle of the invention or sacrificing any of its advantages.

Having thus described the invention, what is claimed as new is:—

1. In a sand blast apparatus a supporting casing, a screen drum within said casing and having one closed end and an annular outwardly directed flange at the other end, said drum having a lateral opening, a detachable closure over said opening, means carried by the casing and attached to the

closed end of the drum for supporting the same for rotation, bearing rollers attached to the casing and engaging the annular flange of the drum near the upper line thereof, whereby the bearing rollers are maintained free from contact with the abrading element which may sift through the drum, and a nozzle device supported by said casing and extending through the open end of the drum.

2. In a sand blast apparatus, a casing having an opening in one of its end walls, a screen drum for an abrading element supported for rotation in said casing and having an opening in one end wall registering with the opening in the casing, a closure for said casing opening and having a transverse opening in turn, a closure for the opening of the last mentioned closure and having a plurality of segmental slots, clamp bolts engaging respectively in the closure of said casing opening and extending through said slots, and a nozzle device supported obliquely by the slotted closure and extending into the drum, whereby the direction of the discharge of the nozzle can be controlled and directed in plurality of directions.

3. In a sand blast apparatus, a casing having an opening in one of its end walls, a screen drum for an abrading element supported for rotation in said casing and having an opening in one end wall registering with the opening in the casing, a closure for said casing opening and having a transverse opening in turn, a closure for the opening of the last mentioned closure, means for rotatively coupling said last mentioned closure to the closure of the casing opening, and a nozzle device supported obliquely to the rotative closure and extending into the drum, whereby the direction of the discharge of the nozzle can be directed vertically and obliquely.

4. In a sand blast apparatus, an enclosing casing having an opening through one of its end walls, a movable door for said casing opening and having a transverse opening in turn, a closure for the transverse opening of said door, a nozzle device carried by the closure for said door opening, a screen drum mounted for rotation in said casing and into which the discharge tip of said nozzle extends, and means for adjustably coupling said nozzle device to said closure to enable the direction of the discharge of the nozzle to be directed vertically and obliquely.

In testimony whereof, we affix our signatures hereto.

ISAAC M. KEMP.
EDWARD C. WIEDERHOLD.