

Oct. 23, 1923.

1,472,015

R. G. COBURN

SAND BLAST NOZZLE

Filed March 30, 1918

2 Sheets-Sheet 1

Fig. 1.

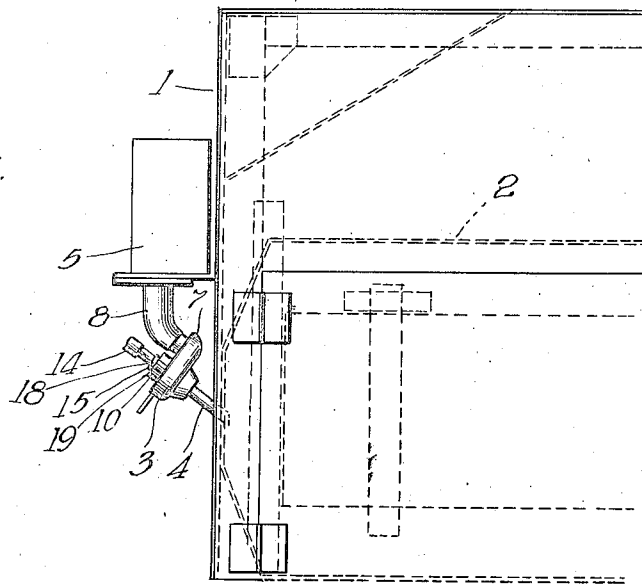
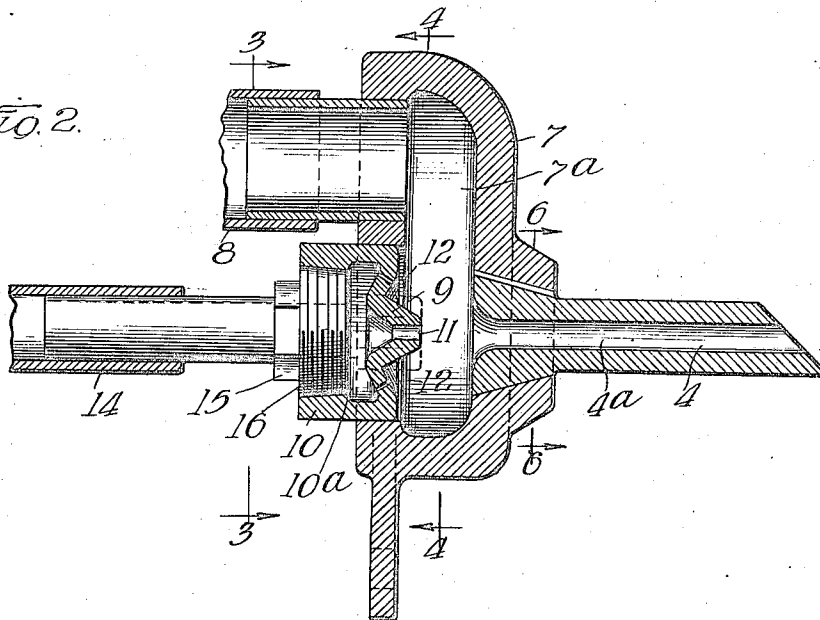


Fig. 2.



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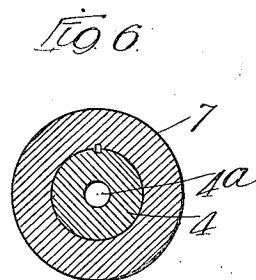
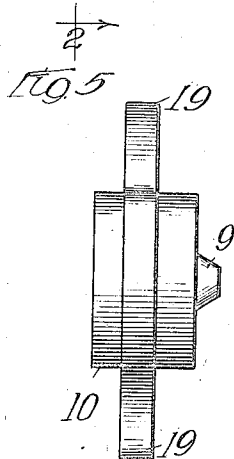
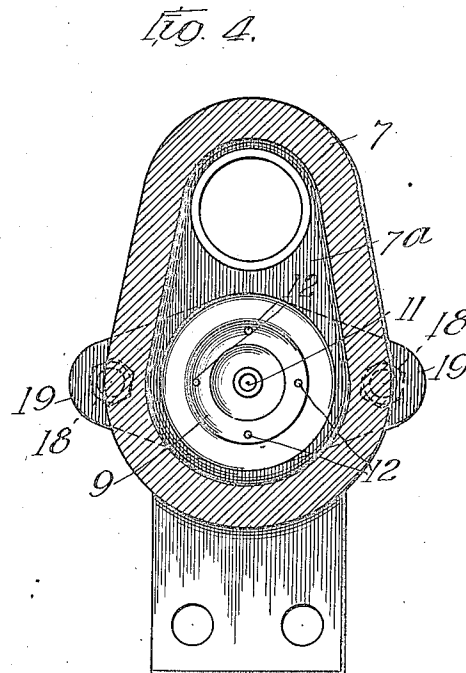
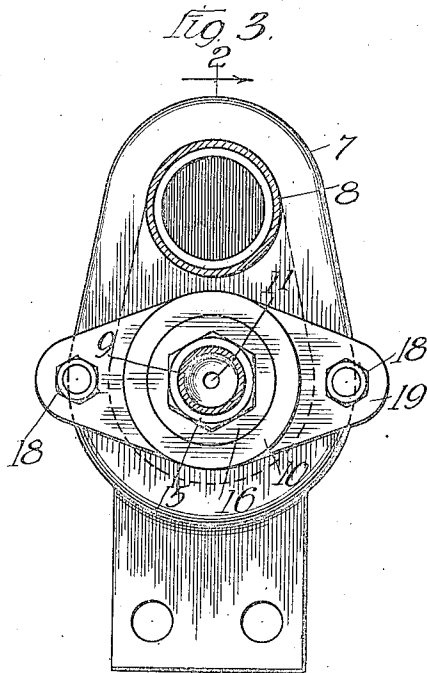
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2 Sheets-Sheet 2



Witnesses:
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UNITED STATES PATENT OFFICE.

RICHARD G. COBURN, OF CHICAGO, ILLINOIS.

SAND-BLAST NOZZLE.

Application filed March 30, 1918. Serial No. 235,704.

To all whom it may concern:

Be it known that I, RICHARD G. COBURN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sand-Blast Nozzles, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to nozzles for sand blast machines, and has for its object the provision of a sand blast nozzle which shall be particularly effective in operation.

In the accompanying drawings Fig. 1 is an elevation of an end portion of a sand blast machine having a nozzle embodying my present invention;

Fig. 2 is a longitudinal section of the nozzle itself;

Figs. 3 and 4 are cross sections taken on lines 3—3 and 4—4, respectively, in Fig. 2;

Fig. 5 is a side elevation of a portion of the nozzle;

Fig. 6 is a cross section taken on line 6—6 in Fig. 2.

In the drawings Fig. 1 shows a portion of a sand blast machine forming no part of my present invention. This machine is simply shown as one illustration of the use of my improved sand blast nozzle. It will be understood that the nozzle may be applied to other and various different types of sand blast machines.

Inasmuch as the aforesaid machine is no part of my present invention it will not be necessary to describe it here further than to say that 1 is the exterior frame of the machine within which there is a rotary barrel 2, in which barrel it is intended to place castings or other articles to be treated by the sand blast. The barrel 2 is arranged for rotation so as to bring the castings or other articles in position to be treated one after another by the sand blast, and there is suitable mechanism for rotating the barrel and also for opening it to permit the insertion and removal of the articles. These mechanisms, however, will not be described for the reason given.

An improved sand blast nozzle embodying my present invention is mounted at the left hand side of the frame 1 in position to direct a sand blast upon the articles within the barrel 2. This nozzle is indicated at 3 and has a tubular member or spout 4 which

passes through the wall of the frame 1 and also into the end of the barrel 2 so as to discharge sand inside of the latter. In connection with this nozzle 3 there is a reservoir 5 for sand or like material which is preferably mounted above the nozzle, so that the sand may be fed to the latter by gravity.

The nozzle itself is best shown in Figs. 2 to 6, inclusive. It is provided with a hollow member 7 which serves as a support or holder for the spout or outlet 4. This member 7 is also connected by means of a tube or hose 8 with the sand box 5, so that the sand may descend and enter the chamber 7^a within the member 7. An air blast nozzle 9 is provided by a member 10 which is fitted into the rear wall of the hollow member 7, preferably in a removable manner so as to permit the removal and the replacement of said member 10. The nozzle 9 has a main air outlet or orifice 11 which is directly in line with the bore 4^a of the nozzle or discharge member 4. Side nozzles 12 are arranged at the sides of the main discharge orifice 11 and these nozzles 12 are preferably arranged in annular order around the central orifice 11 and are inclined so as to direct currents of air which shall converge in front of the central orifice 11, as well shown in Fig. 2. As a convenient arrangement the member 10 is constructed so that the central orifice 11 is provided by the tapering portion 9 and the orifices 12 are formed in an annular inclined portion at the base of the member 9. The rear portion of the hollow member 10 is connected with an air tube 14, as by means of a nut 15 having a threaded portion 16, which fits into a correspondingly threaded socket in the rear of the member 10. Thus the air blast coming through the tube 14 will enter the chamber 10^a of the member 10 and be distributed through the central orifice 11 and side orifices 12 and the effect of the distribution through the latter will be to cause the sand coming through the tube 8 to be directed to the locality in front of the central orifice 11 so that the air blast coming through that orifice will be effective in acting directly upon the sand so placed in front of it. This I find by actual trial makes an exceedingly effective arrangement so that the sand is blasted through the nozzle at an exceedingly high velocity and in an unusually efficient manner, giving highly advantageous results in cleaning castings.

for example, which have never been obtained by any other form of sand blast nozzle so far as my knowledge is concerned.

The nozzle as a whole may be supported in any desirable way, but is preferably mounted in a detachable manner so as to permit its removal and replacement, and as stated, the air blast orifice member 10 is also preferably mounted in a detachable manner so as to permit its removal and replacement. The member 10 is also preferably larger than the rear end of the discharge member 4 so that the latter may be moved rearwardly and through the opening in which the member 10 fits, to permit said member 4 to be removed and replaced by another one. The replacement of the nozzle 4 is necessary because of wear by the sand, as well known in this art.

The member 10 providing the nozzle 9 is preferably formed as part of a cross member 19 which is secured to the hollow member or casing 7 by means of bolts 18. Thus the member 10 may be secured firmly in position by means of the bolts 18 and then the air inlet tube may be held in proper position by screwing the threaded portion 16 into the correspondingly threaded socket at the rear of said member 10, which screwing action may readily be done by means of the nut 15 on air tube. To remove the various parts the air tube may be unscrewed so as to withdraw its threaded end 16 from the member 10 and then the member 10 may be removed by unloosening the nuts of the bolts 18 and moving the member 19 so as to withdraw said member 10. If desired to remove the nozzle 4 also this may be pushed back in its socket and then through the opening in the back of the casing 7 from which the member 10 has been withdrawn.

It will be understood that changes and modifications may be made without departing from the spirit of the invention.

What I claim is:

1. The combination of a casing providing a vertically extending mixing chamber, a sand inlet opening into one side of said chamber near the upper end thereof, an air blast nozzle opening into the same side of said chamber below said sand inlet and a sand blast nozzle on the other side of said chamber, the intake end of said nozzle being located opposite said air blast nozzle, said air blast nozzle having a main air orifice aligned with the sand blast nozzle, and supplemental air orifices at the sides of said first mentioned orifice for assisting in the direction of sand into said sand blast nozzle, said first mentioned air orifice being relatively large and said supplemental orifices being relatively small.

2. The combination of a casing providing a vertically extending mixing chamber, a sand inlet opening into one side of said

chamber near the upper end thereof, an air blast nozzle opening into the same side of said chamber below said sand inlet and a sand blast nozzle on the other side of said chamber, the intake end of said nozzle being located opposite said air blast nozzle, said air blast nozzle having a main air orifice aligned with the sand blast nozzle, and supplemental air orifices at the sides of said first mentioned orifice for assisting in the direction of sand into said sand blast nozzle, said first mentioned air orifice being relatively large and said supplemental orifices being relatively small, and said supplemental orifices being arranged in annular order around said first mentioned orifice and being inclined so as to converge at a point in front of said first mentioned orifice.

3. The combination of a casing having front and back walls and forming a mixing chamber, a sand inlet secured to the upper portion of the rear wall, an air blast nozzle secured to the lower portion of said wall and pointing into the mixing chamber and a sand blast nozzle secured to the front wall and having its receiving aperture in line with said air blast nozzle, but separated from the same by space forming a portion of the mixing chamber, said sand blast nozzle having its bore in substantial axial alignment with the bore of said air blast nozzle, said air blast nozzle having a main air orifice aligned with the sand blast nozzle, and supplemental air orifices at the side of said first mentioned air orifice for assisting in the direction of sand into the inlet opening of said sand blast nozzle, said supplemental air orifices being arranged in annular order around said main orifice and being relatively smaller than the same and inclined so as to converge at a point in front of said main air orifice.

4. The combination of a casing providing a mixing chamber, a sand inlet opening into said mixing chamber, an air nozzle arranged to direct air into said chamber below the sand inlet, said air nozzle being provided with a central relatively large orifice and with supplemental relatively small orifices, which latter surround the main orifice and are inclined so as to point in front of the main air inlet and a discharge nozzle secured to said casing on the side thereof opposite said air nozzle and having its bore substantially in alinement with the central air orifices.

5. The combination of a casing providing a mixing chamber, a sand inlet opening into said mixing chamber, an air nozzle arranged to direct air into said chamber below the sand inlet, said air nozzle being provided with a central relatively large orifice and with supplemental relatively small orifices, which latter surround the main ori-

5 fice and are inclined so as to converge at a point in front of the main air inlet and a discharge nozzle detachably secured to said casing on the side thereof opposite said air nozzle and having its bore substantially in alinement with the central air orifice, said air nozzle being provided by a member fitted removably into one side of said casing, and said discharging nozzle being removable from the casing through the opening produced in the casing by the removal of the air nozzle therefrom.

6. The combination of a casing providing a mixing chamber, a sand inlet opening into said mixing chamber, an air nozzle arranged to direct air into said chamber below the sand inlet, said air nozzle being provided with a central relatively large orifice and with supplemental relatively small orifices, which latter surround the main orifice and are inclined so as to converge in front of the main air inlet and a discharge nozzle detachably secured to said casing on the side thereof opposite said air nozzle and having its bore substantially in alinement with the central air orifice, said air nozzle being provided by a member fitted removably into one side of said casing, and said discharge nozzle being provided with a tapering end portion fit-

ting into a tapering socket in said casing, and removable from said casing through the opening resulting from the removal of said air nozzle member.

7. The combination of a casing providing a mixing chamber, a sand inlet opening into said mixing chamber, an air nozzle arranged to direct air into said chamber below the sand inlet, said air nozzle being provided with a central relatively large orifice and with supplemental relatively small orifices, which latter surround the main orifice and are inclined so as to point in front of the main air inlet and a discharge nozzle detachably secured to said casing on the side thereof opposite said air nozzle and having its bore substantially in alinement with the central air orifice, said air nozzle being provided by a member fitted removably into one side of said casing, said discharge nozzle being removable from the casing only through the opening which results from the removal of said air nozzle member, and an air tube member having a screw threaded connection with the rear of said air nozzle member.

In witness whereof, I hereunto subscribe my name this 25th day of January A. D., 1918.

RICHARD G. COBURN.