March 30, 1926. 1,578,862

J. H. STALEY

SAND BLAST APPARATUS

Filed April 9, 1924

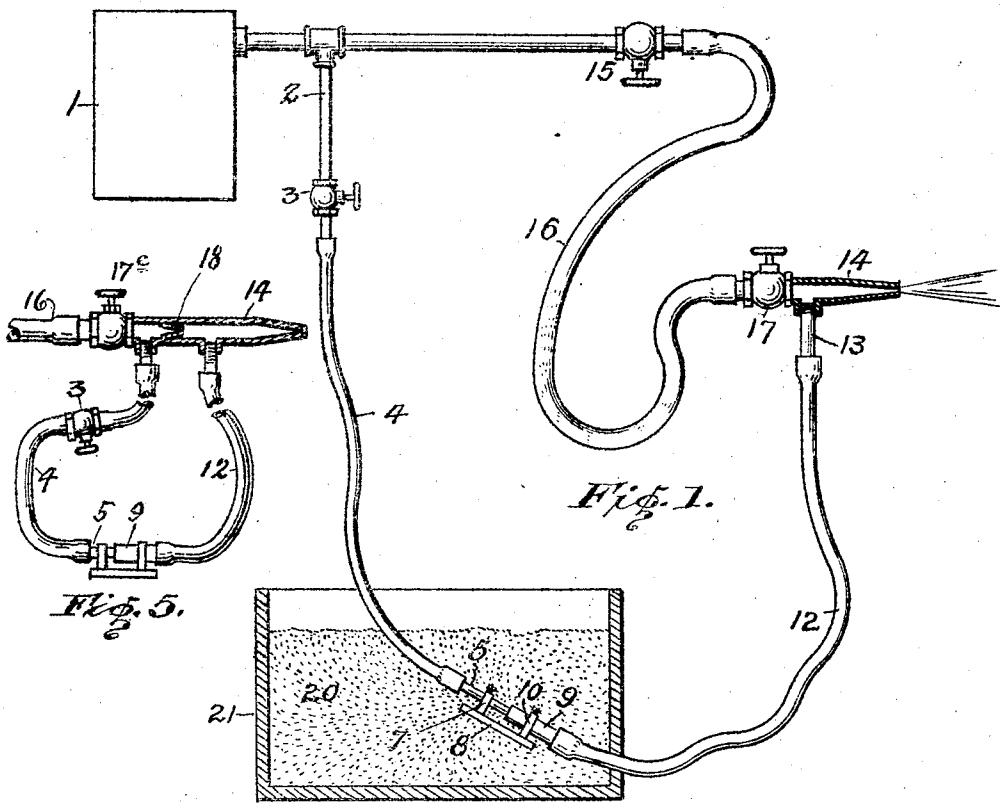


Fig. 1.

Fig. 5.

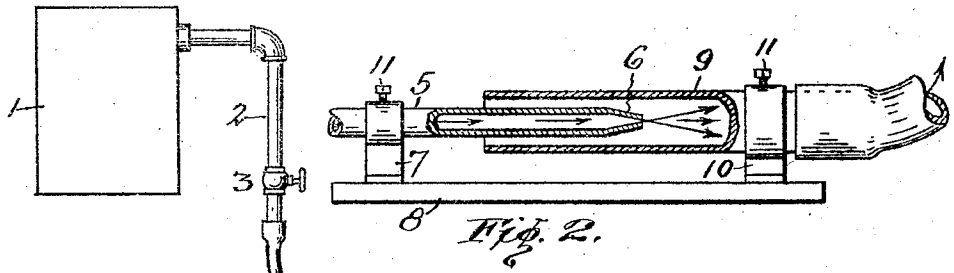


Fig. 2.

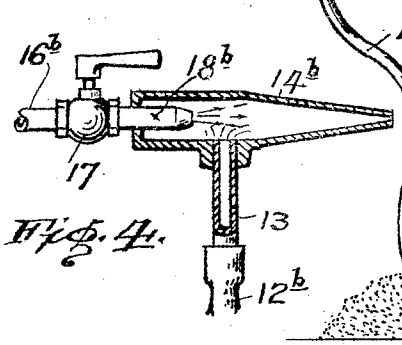


Fig. 4.

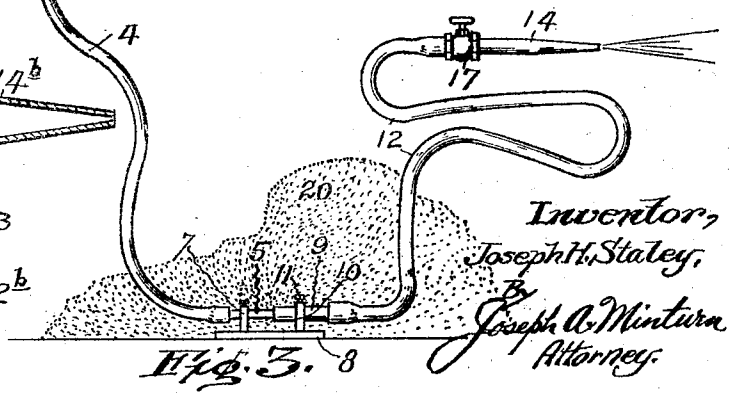


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOSEPH H. STALEY, OF COLUMBUS, INDIANA.

SAND-BLAST APPARATUS.

Application filed April 9, 1924. Serial No. 705,174.

To all whom it may concern:

Be it known that I, JOSEPH H. STALEY, a citizen of the United States, residing at Columbus, in the county of Bartholomew and State of Indiana, have invented new and useful Improvements in Sand-Blast Apparatus, of which the following is a specification.

This invention relates to improvements in apparatus for forcibly discharging sand for etching, cleaning and scouring purposes, for discharging fluids for surface coating and spraying, and generally for moving substances comprised of loosely adherent particles.

The object of the invention is to provide means by which the mixture of air may be regulated to the character of the substances to be moved by it in order that clogging the apparatus might be prevented and to regulate the speed of the discharge and the force of impact with which the substance is thrown.

Another object is to supplement the original moving force where conditions make that desirable. In other words, the object of this invention is to provide an apparatus for the purpose specified that will enable the feed of the material to be regulated by adjusting the air pressure; that will allow adjustment of the proportions of air to the material moved by it, adjustment of the amount of mixture being discharged and adjustment of the blast-force of its discharge.

I accomplish the above and other objects which will hereinafter appear, by the mechanism diagrammatically illustrated in the accompanying drawings, in which—

Fig. 1, shows a discharge nozzle in longitudinal section, connected with a tank containing compressed air, by a pipe having a control valve and also having a mixer through which sand or other material to be discharged at the nozzle is drawn into the air-flow through the pipe and also having an auxiliary air-pipe supplying air under pressure from the tank to the nozzle, with control valves located in said auxiliary pipe. Fig. 2, is a view in elevation and partial longitudinal section of the mixer. Fig. 3, is a view similar to Fig. 1 with the auxiliary air-pipe omitted, and Fig. 4, is a longitudinal sectional view of a suction nozzle to be substituted in place of the nozzle shown in Figs. 1 and 3. Fig. 5, is a modification of the nozzle shown in Fig. 4, connecting it with a mixer by a flexible hose as in Fig. 1.

Like characters of reference indicate like parts in the several views of the drawing.

The tank 1, is of any usual and suitable construction filled with compressed air by any approved means, not shown. Leading from it is a pipe 2, having the control valve 3, and discharging into a flexible hose 4. The flexible hose 4 is attached to the end of a rigid member 5 which terminates at its outer end with a nozzle 6, (see Fig. 2). The member 5 is supported by any suitable means, here shown as by a standard 7 mounted on a portable base 8. The nozzle end of member 5 discharges into the end of a much larger member 9, also suitably supported, here shown by a standard 10 mounted on the base 8. The two members comprise a mixer and are preferably adjustable longitudinally in their standards to vary the position of member 5 relative to the member 9 and any given adjustment of the members in their standards is retained by set-screws 11. These mixer members may be suitably shaped and positioned parts of a one-piece casting.

A flexible hose 12 is attached at one end to the outer end of the member 9, and at its other end with a rigid pipe 13 which discharges into the side of a nozzle 14.

A branch of pipe 2 has a control valve 15 and said branch is connected by a flexible hose 16 with the inner end of the nozzle 14, and for the convenience of the operator at the nozzle, a valve 17 is preferably located on that end of the nozzle into which hose 16 discharges.

In the operation of my apparatus, the sand, paint, or other material 20, to be discharged, is contained in a tank 21, or the like, when a container is necessary to hold it, and the mixer members 5 and 9, in suitable adjustment relative to each other retained by standards 7 and 10 and base 8, are submerged in the material 20. The valve 3 is opened and material 20 mixed with air, is drawn into member 9 and discharged through hose 12 and nozzle 14. The discharge through the nozzle is accelerated by opening valves 15 and 17. A maximum opening is obtained at valve 15 and adjustments of air discharge through hose 16 under that are conveniently made at the nozzle with valve 17. Anywhere that the open end of member 9 is submerged in

the material 20 will cause the material to enter the member, partly by gravity and partly by suction, where it is mixed with air coming under pressure through hose 4 and is forced through hose 12 and out through nozzle 14. This, under many conditions of use, is sufficient without the aid of additional pressure coming through the auxiliary hose 16, and the latter, therefore, is discarded as illustrated in the equipment shown in Fig. 3.

The nozzle shown in Fig. 4, differs from that shown in Fig. 1, in that compressed air coming through hose 16^b is discharged through a nozzle 18^b into the inner end of nozzle 14^b and a suction is created to aid in drawing the material through hose 12^b, into the nozzle, and a blast is retained to positively drive it out.

The modification shown in Fig. 5, adapts the nozzle of Fig. 4 to the structure of Fig. 1. It will be apparent that when the valve 17^c is turned off the operation of the apparatus ceases.

The apparatus is illustrated diagrammatically to make its construction easily understood but in practice it may be variously modified to suit conditions of manufacture and use, some of which have been here illustrated and described, without departing from the spirit of the invention and I therefore do not desire to be limited to any precise forms more than is required by the appended claims.

I claim:—

1. In a device for the purposes specified, a pipe open at one end, a nozzle, and means for maintaining the nozzle in aligned relationship with the pipe such as to leave a substantially unobstructed space for the entrance to the pipe from all directions of loose surrounding material.

2. In a device for the purposes specified, a pipe open at one end, a nozzle, means comprising supporting bearings and a connecting member, such that a substantially unobstructed space for the entrance of loose surrounding material from all directions is provided into the pipe.

Signed at Columbus, Indiana, this the 7th day of April, 1924.

JOSEPH H. STALEY.