H. L. WADSWORTH.

SAND BLAST MACHINE.

APPLICATION FILED APR. 22, 1912.

1,171,286.

Patented Feb. 8, 1916.

2 SHEETS—SHEET 1.

FIG. 1

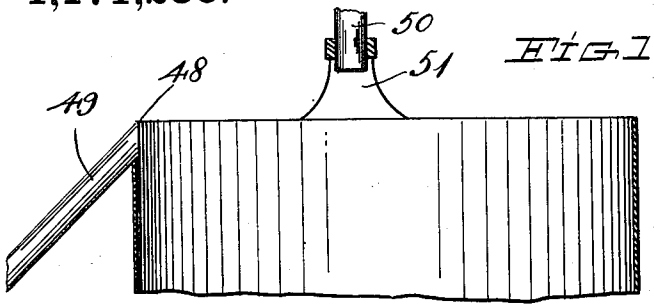


FIG. 2

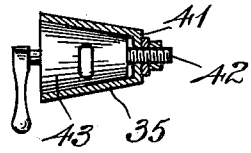


FIG. 3

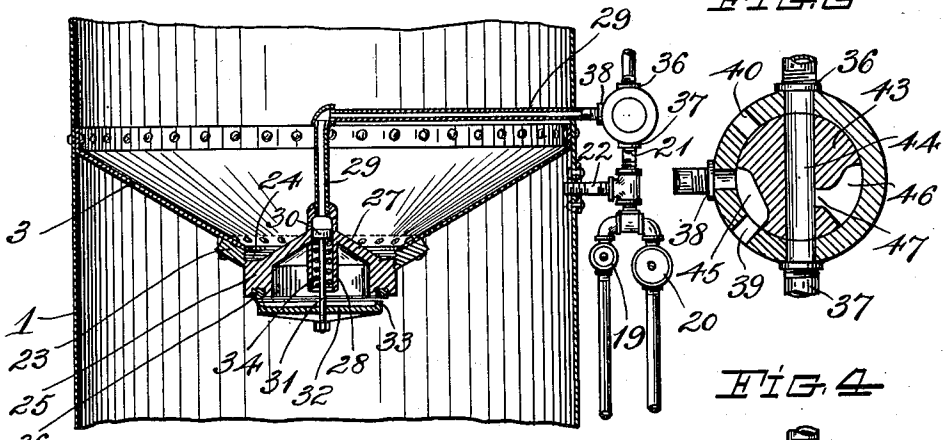


FIG. 4

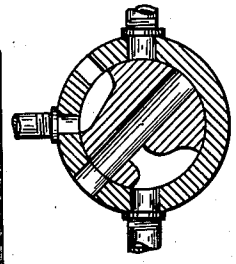
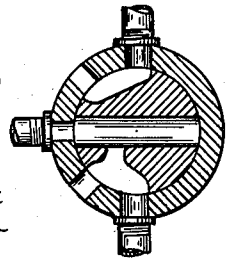


FIG. 5



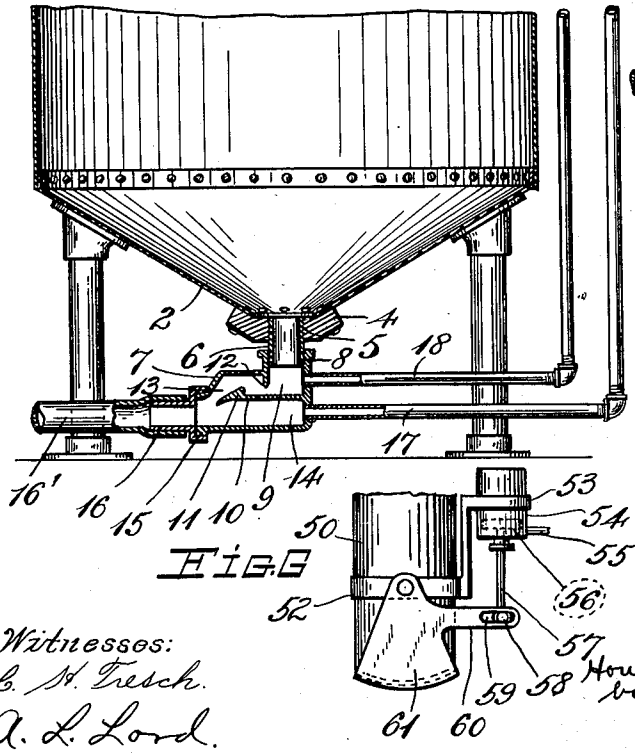


FIG. 6

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2 SHEETS—SHEET 2.

Fig. 7.

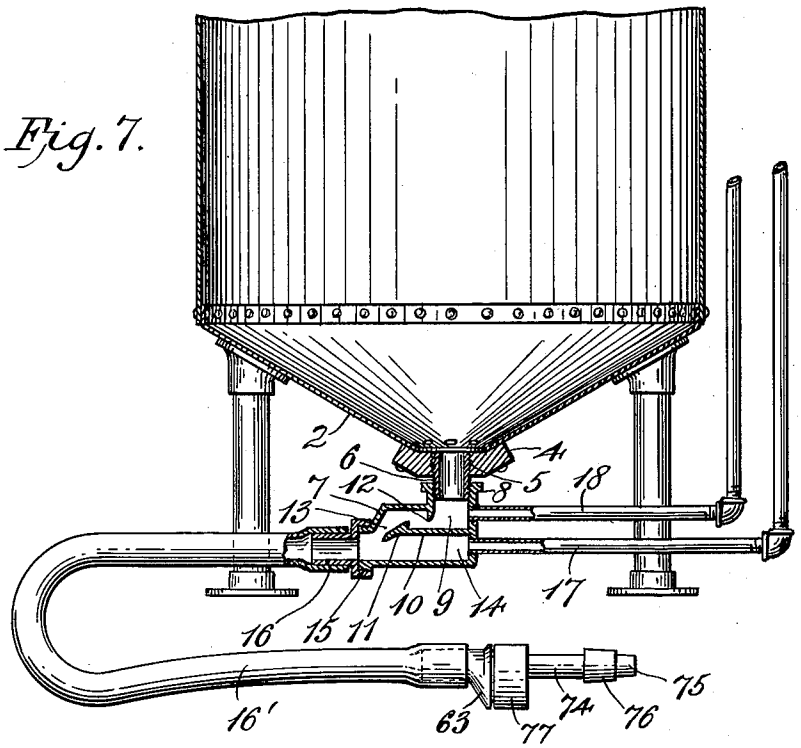


Fig. 8.

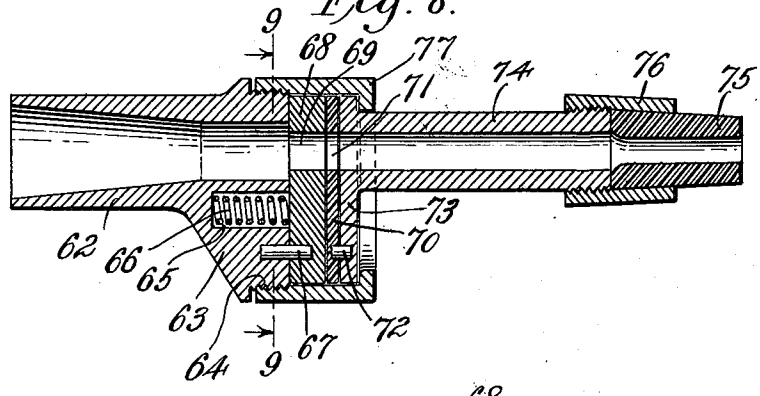
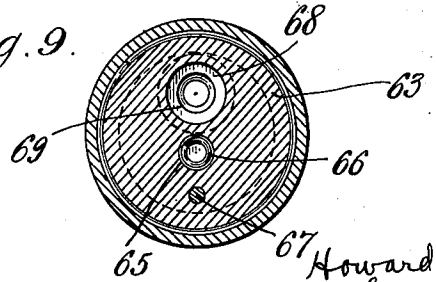


Fig. 9.



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UNITED STATES PATENT OFFICE.

HOWARD L. WADSWORTH, OF CLEVELAND, OHIO.

SAND-BLAST MACHINE.

1,171,286. Specification of Letters Patent. Patented Feb. 8, 1916.

Application filed April 22, 1912, Serial No. 692,279.

To all whom it may concern:

Be it known that I, HOWARD L. WADSWORTH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, 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 machines generally and particularly to mechanism for controlling the sand feed to the hose line and the supply of sand to the machine.

Referring to the drawings, Figure 1 is a sectional view of the device; Fig. 2 is a sectional view, part in elevation, showing the controlling valve; Fig. 3 is an enlarged sectional view of the controlling valve showing the ports in one position; Fig. 4 is a sectional view with the ports in another position; Fig. 5 is a sectional view of the controlling valve with the ports in still another position; Fig. 6 is a detail view of mechanism for controlling the discharge of sand into the reserve portion of the machine; Fig. 7 shows the tank and trap in section, together with a discharge hose and discharge nozzle; Fig. 8 is a longitudinal sectional view of the nozzle; and Fig. 9 is a section upon the line 9—9 of Fig. 8.

More specifically the invention relates to a sand blast machine comprising a tank or main receptacle 1 having a hopper-shaped bottom 2 and a hopper-shaped partition 3 separating the tank into upper and lower compartments. The lower hopper bottom 2 is provided with a ring 4 having a threaded opening 5 adapted to receive a nipple or pipe connection 6 which supplies sand to the sand and air mixing device.

The mechanism for delivering the mingled sand and air is in the form of a sand and air mixing device, and it comprises a casing 7 having a connection 8 adapted to thread onto the nipple 6 and communicating with a chamber 9 within the casing. The chamber 9 is arranged above a partition 10 extending horizontally and longitudinally of the casing and provided at the end with a projection 11 extending up above the upper surface of the partition 10, as shown. Projecting from the upper part of the casing is a short partition 12 which extends to a point near the partition 10 but is spaced therefrom and is preferably arranged to allow space between the projection 11 and the projection 12 for the sand to be elevated into a channel or opening 13 extending beyond the end of the partition 10 and communicating with a longitudinally disposed chamber 14 below the partition 10. The end of this casing 7 is provided with a threaded portion 15 for receiving the discharge pipe 16 which may be supplied with the usual hose and nozzle construction but not shown in the present instance. The casing 7 at a point opposite to the connection 15 or in other words opposed to the discharge, is provided with two air inlet pipes 17 and 18, the pipe 18 communicating with the chamber 9 and the pipe 17 communicating with the chamber 14. The pipe 18 is provided with a valve 19 for adjusting the volume of air passing through it, while the pipe 17 is provided with a valve 20 for regulating the volume of air passing through it. These two pipes are branches of a main line 21 which is connected by a branch 22 with the lower chamber of the tank 1.

The operation of the mechanism already described is as follows: Assuming that there is a pressure of air in the line 21 and that the valves 19 and 20 are properly adjusted, air flows into the tank above the sand and to the chambers 9 and 14 causing the sand to be driven by the stream of air in the line 18 below the projection 12 above the projection 11 and into the chamber 14 toward the discharge pipe 16. At the same time the pipe 17 is delivering a charge of air for further completing the mixture and for further driving the sand through the discharge hose.

Suitable means is provided for controlling the supply of sand to the chamber below the partition 3 and it comprises a ring 23 secured to the hopper-shaped partition 3 at the center having a threaded opening 24 therein for receiving a valve seat 25 having a rubber gasket 26 mounted in a recess in the lower edge thereof. This seat is provided with inwardly projecting arms 27 supporting a cylinder 28 at the center. This cylinder is supplied with air through a pipe 29 which is connected to the valve mechanism to be described. Within the cylinder 28 is a piston 30 having a rod or stem 31 carrying at its lower end a valve 32 provided with an upwardly extending flange 33 adapted to seat upon the rubber gasket 26. A spring 34 surrounds the rod and normally tends to seat the valve 32 against the action

of pressure on the opposite side of the piston 30. This valve is adapted to be opened by air supplied on the upper side of the piston 30 when the air is exhausted from the lower chamber of the casing or tank and when the lower chamber is filled with sand the machine is ready for operation. The pressure is admitted within the lower chamber through the pipe 22 when the air will blow over the flange 33 and remove any particles of sand which might tend to prevent the closing of this valve.

The admission of air to the several lines is controlled by a single valve comprising a casing 35 having suitable connections 36 and 37 for the main air line 21, a connection 38 for the air line 29, and suitable exhaust openings 39 and 40, the former arranged between the connections 36 and 38 and the latter between the connection 37 and the connection 38. This casing is provided with a tapered opening and with a back wall 41 having an opening therein for receiving a threaded stem 42 connected to a valve plug 43 which is provided with a through port 44, a peripheral recess port 45 and another peripheral recess port 46 connected by a port 47 with the main air line port 44. The arrangement of these ports is such that the following operations may be performed. Assuming that the machine is to be started and that the main receptacle is empty, the operator swings the valve until the port 46 is in communication with the main supply, the port 44 being then in communication with the pipe 29, the result being that the valve 32 is lowered and sand flows readily into the lower chamber. The operator then throws the valve into the position shown in Fig. 2, when air rushes down in through the pipe 22 upon the surface of the sand and also flows down through the pipes 17 and 18 and starts the operation of the blast, the air above the piston 30 escaping through the exhaust 40, as shown in Fig. 2. When the operator wishes to cease operations, the valve is thrown into the position shown in Fig. 3 and the main inlet is lapped and there is no air supply to any of the parts. When it is desired to exhaust the air from the main line, the valve is thrown into the position shown in Fig. 4.

In order to properly fill the upper chamber the side of the chamber is cut away at 48 and a chute 49 is secured to the outside of the tank to convey the sand as it passes through the recess 48 and at the same time the sand is supplied to this chamber by a supply pipe 50 mounted in a support 51 secured to the side of the tank or casing. This pipe is preferably to one side of the center as shown, or in other words, it is eccentric to the casing, so that it will deliver the sand nearer to the chute or spout 49 whereby when the upper part of the casing is filled the overflow will pass down through the chute from whence it may be collected in any suitable manner.

The supply pipe 50 may be supplied with a closing device as shown in Fig. 6, and this mechanism comprises a support 52 secured to the pipe and carrying an arm 53 supporting an air cylinder 54 which is to be supplied with air by the pipe 55 in any suitable manner. This cylinder is provided with a piston 56 shown in dotted lines in Fig. 6. This piston has a rod 57 provided with a pin 58 engaging in a slot 59 in an arm 60 secured to a valve 61 which is in the form of a scoop extending over the mouth of the pipe and preventing discharge of sand therefrom.

A suitable nozzle is provided for the hose 16′ and it comprises a shank 62 which is provided with a boss or an enlargement 63 having a threaded shank 64 for a purpose to be described. This boss or enlarged portion 63 is provided with a recess 65 in which is mounted a coiled spring 66 which when distended extends beyond the face of the enlargement 63. A pin 67 is secured in the enlargement and projects beyond the outer face as shown, and into a hardened steel disk 68 provided with an opening 69 eccentrically located with respect to the center of the disk. The enlargement 63 is also eccentrically located with respect to the opening in the shank. Engaging the flat face of the disk 68 is another hardened steel disk 70 provided with an opening 71 adapted when in one position to register with the opening 69 and also provided with an opening receiving a pin 72 which engages in a flange 73 held with its face against the disk 70. This flange is provided with a hollow shank 74, the opening of which alines with the opening 71 in the disk 70. This shank and the opening therein are arranged eccentric to the center of the flange 73 in a manner similar to the openings 71 and 69, so that when these parts are in one position they aline and furnish a discharge from the shank 62 or from the hose 16′. The end of the shank 74 is provided with the usual hardened steel nozzle 75 held in place by a suitable sleeve 76. The several parts, including the flange 73, are held in place upon the enlargement 63 by means of a coupling 77 which is screwed onto the threaded portion 64.

The arrangement of the parts is such that the flange 73 and the disk 70 may turn freely within the coupling 77 and against the face of the steel disk 68 and by reason of the eccentricity of the openings in the several parts, the flow through the nozzle arrangement may be cut off as desired.

Having described my invention, I claim:

1. In a sand blast machine, a sand receptacle having a hopper bottom, and a mixing

and discharge device at the lower end of said hopper bottom and comprising a casing in communication with the receptacle, said casing being provided with an air channel, a sand channel communicating with said air channel at the top, a sand trap located in said sand channel and preventing the gravitation of the sand into the air channel, means for driving the sand from the sand channel, and means for supplying air to the air channel.

2. In a sand blast, a sand receptacle, and a mixing device comprising a casing, an air channel, a sand channel communicating therewith, a sand inlet to the sand channel, a trap arranged in said sand channel comprising suitable projections forming the trap, an air line for driving the sand from said trap, and an air line connected to the air channel.

3. In a sand blast, a sand receptacle, a mixing device comprising a casing connected to the tank by a sand inlet, a sand outlet, an air channel substantially in alinement with said sand outlet, a sand channel communicating with said air channel at a point out of alinement with the sand inlet, a projection extending upward into the sand channel, a projection extending downward into the sand channel nearer the sand inlet, said projections in said sand channel forming a trap for preventing the free discharge of sand from the receptacle, an air line connected to said casing and arranged to drive the sand from said trap into the air channel, and an air pipe supplying air to said air channel.

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

HOWARD L. WADSWORTH.

Witnesses:
G. O. FARQUHARSON,
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