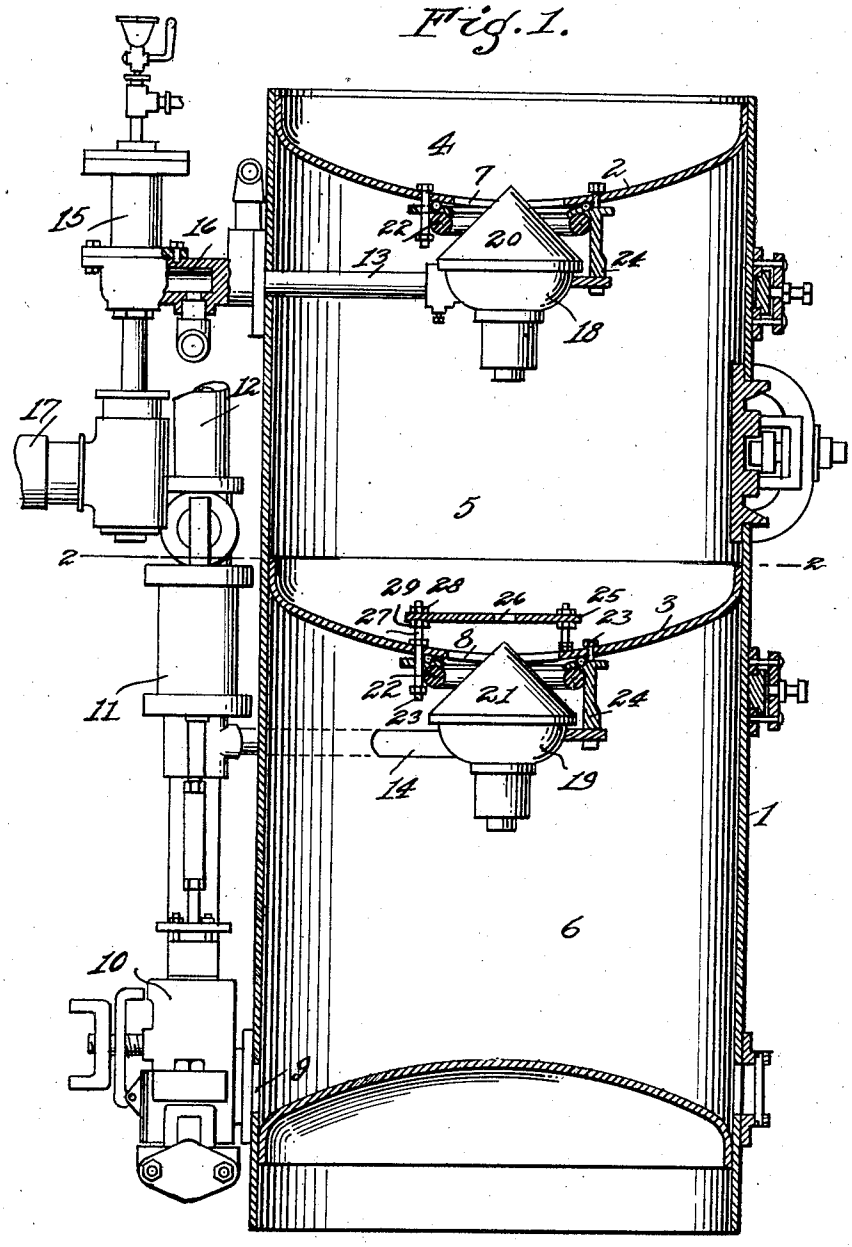
June 8, 1948. A. B. RUCKI 2,443,148

SAND BLAST APPLIANCE

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Fig. 1.



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Fig. 2.

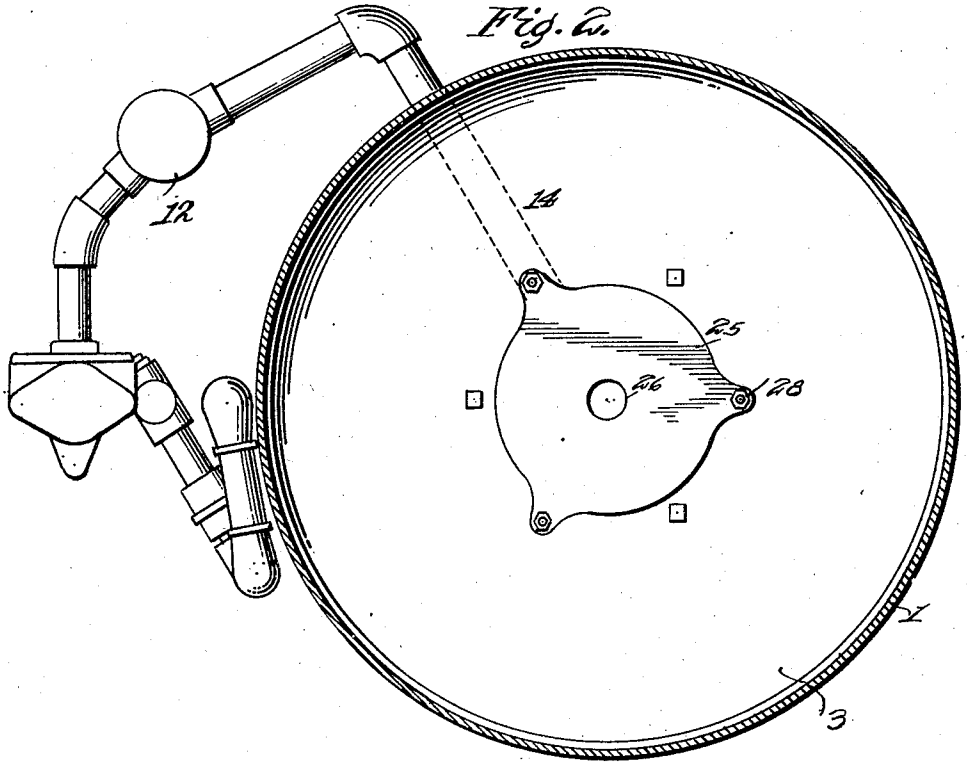
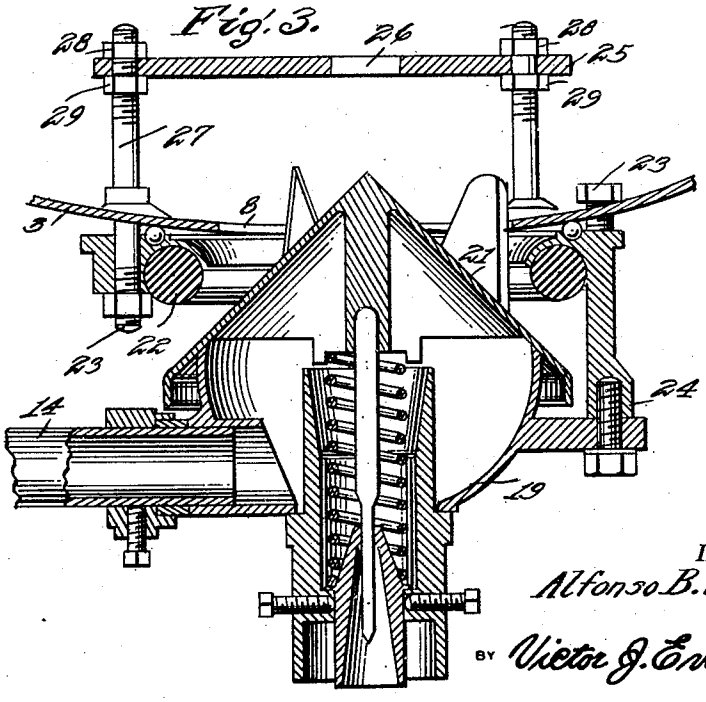


Fig. 3.



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SANDBLAST APPLIANCE

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Application June 3, 1946, Serial No. 674,146

6 Claims. (Cl. 51—12)

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My present invention relates to improvements in sand blast appliances of the pneumatic type disclosed in Patents #1,710,169 and #1,816,583, which are characterized by a pressure tank having interior feeding and charging compartments, and a valve or valves for controlling the flow of sand from the feeding compartment or chamber to the charging chamber.

In the actual sand-blasting operations of appliances of the above mentioned type undesirable and objectionable conditions are encountered, due to defects and inefficiencies in the performance of the functions of the valve controlling the flow of sand or other abrasive material from the feeding chamber to the charging chamber of the pressure tank.

The primary object of the present invention is to eliminate these undesirable and objectional conditions by improving the mechanical construction and arrangement of parts in connection with the filling port and valve between the feeding chamber and the charging chamber of the tank; to insure maximum feeding and charging of the tank with sand, to prolong the sand blasting operations, and to attain efficient and smooth performance of functions in the sand blasting operations.

In the physical embodiment of my invention I utilize in the pressure tank, and in combination with the filling port and filling valve, a baffle plate or load-supporting member that is capable of shielding and protecting the valve to assure free flow of the sand from one chamber to another, and to permit smooth and correct operation of the controlling valve.

The invention consists essentially in certain novel combinations and arrangements of parts as will hereinafter be set forth and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention, wherein the parts are combined and arranged according to one mode I have thus far devised for the practical application of the principles of my invention, but it will be understood that changes and alterations may be made in these exemplifying drawings and mechanical structures, within the scope of my appended claims without departing from the principles of the invention.

Figure 1 is a vertical sectional view through the pressure tank of a sand blast appliance in which my invention is embodied.

Figure 2 is a transverse horizontal sectional view at line 2—2 of Fig. 1.

Figure 3 is an enlarged detail sectional view showing one of the valves and the baffle plate combined therewith.

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In order that the construction, operation, and utility of the improvements may readily be undertsood I have illustrated in the assembly view Fig. 1, a cylindrical pressure tank 1 having a closed bottom, an upper head 2, and an interior horizontally disposed, upwardly concaved partition or header 3, which divide the tank into a top filling chamber 4, an upper feeding chamber 5, and a lower charging chamber 6, for the sand or other abrasive.

The supply of sand flows through the filling hopper by way of the inlet port 7, thence through chamber 5 to and through circular port 8 of the partition 3, into the charging chamber 6, thence through the discharge port 9 to a mixing chamber 10, from which the sand blast may be conducted through hoses to nozzles for the sand-blasting operations.

Air under pressure is supplied from a compressor, not shown, to the mixing chamber 10, and to an air engine 11, and the compressed air is also supplied to the two filling or control valves within the tank from the pump through the main air line 12 of the compressor, and branch pipes 13 and 14 are extended from the exterior of the tank to the interior thereof for connection with the valve devices.

Other accessories of the appliance include a bleeder valve 15 connected to a manifold 16 with which the branch pipe 13 connects, and an exhaust pipe 17 is connected with the bleeder to reduce pressure of air in the upper or feeding chamber of the tank and release the control valve for this chamber.

The circular ports 7 and 8 are adapted to be closed, by pneumatic pressure through pipes 13 and 14, which pipes lead to identical valve-cups 18 and 19, that support conical valves 20 and 21. These pneumatically closed valves are alined with the ports 7 and 8 and they are lifted by air pressure within the cups to close the respective ports. The valves may be opened, or dropped from the ports by gravity, in the absence of air under pressure. An annular seat or open circular cushion 22, of rubber or other suitable material, for the valve, is mounted by bolts 23 and bracket casting 24 beneath the respective ports.

The novel features and combinations of my invention reside in the utilization of a flat, horizontally disposed, circular disk, baffle-plate, or load-carrying member 25, that is fashioned with a small central orifice or aperture 26 alined with the center of the port 8.

The baffle plate is fixed in elevated position over the port 8, and its diameter is greater than the diameter of the port 8 in order that the circular edge of the plate projects beyond the circular wall of the port, and the plate forms a dead air space over the seating area of the conical valve.

The baffle plate may be mounted over the port in any suitable manner, as by means of a series of spaced stud bolts 27 that are welded at their lower ends to the upper face of the intermediate partition or head 3 adjacent the port 8, and the plate is bored or drilled to provide holes for the bolts.

The baffle plate is adjustably mounted on the bolts, and for that purpose each bolt is provided with a pair of lock nuts 28, 29, that hold the plate in adjusted position with relation to the port 8.

For sand blasting operations the feeding chamber 5 is supplied with sand through port 7, after the bleeder valve 15 is opened to reduce pressure to atmospheric conditions within the chamber, and valve 20 is lowered to open position to permit sand to fill the chamber 5. At this time the lower valve 21 has been raised by compressed air to close its port 8, thus maintaining a normal and constant pressure of air within the charging chamber or pressure chamber 6.

After a sufficient supply of sand has been admitted to feeding chamber 5, the bleeder valve is adjusted to cut off exhaust, and to supply air under pressure to the valve cup 18, which lifts the valve 20 to closed position in the port 7, and under these conditions, the pressure of air in the two chambers is equalized.

The weight of sand in the feeding chamber overloads the valve 21, and, in addition to the force of gravity, tends to open the valve, resulting in withdrawal of the valve from its port 8, to permit flow of sand from the feeding chamber to the charging chamber.

In this flow the movement of sand is biased around the edge of the circular baffle plate, under the plate, and through the space between the plate and the partition into and through the port, and a stream of sand flows through the central aperture of the plate to relieve congestion of the abrasive over the plate.

Thus by the presence of the baffle plate in the feeding chamber disposed over the port 8 the direct load of sand that would otherwise impinge on the valve is eliminated, and the weight or load is borne by the baffle plate, leaving the valve free for operation, with close contact with its seat, to prevent movement of air currents through the port 8. The absence of an overload directly above the valve permits the valve to seat itself with an air tight fit against the seat-cushion 22, thus shutting off seepage of air from the charging chamber to the feeding chamber.

In the customary arrangement and use of the cone valve in existing appliances a quantity of undesirable grains of the abrasive material usually lodges between the valve and its seat, which stifles the closing movement of the valve, and results in leakage of air from the charging chamber to the feeding chamber.

Due to the formation of the dead air space between the baffle plate and the seating area of the cone valve, as the valve snaps to closed position, any residue of abrasive material flowing through the port sweeps past the valve and flows away from the seat into the dead air space beneath the baffle plate. This sweeping flow of the residue and its absence from the valve and seat permits the valve to close smoothly and evenly against its seat, for effectively separating the charging chamber and the feeding chamber.

This correct and precise seating of the valve 21 occurs after the bleeder valve has been manually manipulated to exhaust pressure from the feeding chamber, and this quick-action of the pneumatically closed valve prevents reduction of pressure in the charging chamber, which pressure is necessary for a constant and continuous charging of the manually controlled nozzles.

By eliminating the possibility of overloading the valve with a direct weight of sand, and supporting a portion of the load on the baffle plate, the capacity of the feeding chamber is increased, and a larger quantity of sand may be supplied to the feeding chamber to sustain the sand-blasting operations for a longer duration of work.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a pneumatic sand blast appliance, the combination with a tank having an interior concave partition forming a feeding chamber and a charging chamber with a central port between said chambers, of a conical valve mounted in the charging chamber and means for operating the valve to close the port, a circular baffle-plate mounted over the port whereby the flow of abrasive around and under the edge of the plate is biased to and through the port and means on said partition for adjustably positioning said baffle-plate relative to said port.

2. In a sand blast appliance, the combination with a tank having a partition forming interior feeding and charging chambers with a port between the chambers, of bolts mounted on the partition adjacent said port, a baffle plate slidably mounted on the bolts above the port, locking nuts threaded on the bolts for retaining the plate in adjusted relation on said bolts and thereby to the port, a valve mounted in the charging chamber and on said partition, and means for operating the valve to close the port.

3. In a sand blast appliance, the combination with a tank having a concave partition forming interior feeding and charging chambers with a central circular port between the chambers, a valve mounted in the charging chamber, and means for operating the valve to close the port, of a flat circular baffle plate disposed in horizontal position over the port, supporting bolts mounted on the partition adjacent the port and passed through holes in the plate for slidably supporting the same, and lock nuts on opposed sides of the plate threaded on the bolts for retaining the plate in adjusted position on said bolts.

4. In a pneumatic sand blast appliance, the combination with a tank having a partition forming interior feeding and charging chambers with a port between the chambers, of a baffle plate having a central aperture and spaced above the port, supporting means for said plate mounted on the partition, a conical valve mounted in the charging chamber, and means for operating said valve to close said port and aperture.

5. In a pneumatic sand-blast appliance having a feeding chamber containing abrasive material, a charging chamber, and an intermediate port between said chambers, the combination with a gravity-opened conical valve mounted in the charging chamber, and means for operating the valve to close the port, of a baffle plate means mounted over the port to form a dead air space, whereby the direct weight of abrasive material

is substantially eliminated and residue abrasive material is swept into said space to insure air-tight closing of the valve, said baffle plate means including bolt devices for varying the height of the dead air space above said port.

6. In a sand blast machine having a pressure tank provided with a partition forming an upper feeding chamber for receiving abrasive material and a lower charging chamber, said partition having a circular opening for the passage of the abrasive material from the upper to the lower chamber, a valve means in said pressure tank for controlling the flow of abrasive material through said circular opening, the combination therewith of a plurality of bolts angularly spaced from each other and circumferentially arranged on the partition about the opening, the angular spacing between the bolts forming entrances for the flow of material to the opening, a baffle plate having a predetermined diameter greater than that of the circular opening to overhang the periphery of

the same, said plate being slidably mounted on said bolts for adjustment relative to the central opening, and means on said bolts for locking said baffle plate to the same in selected positions thereon whereby said baffle plate prevents the weight of the abrasive material in the upper feeding chamber from being directly impressed upon the valve.

ALFONSO B. RUCKI.

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