

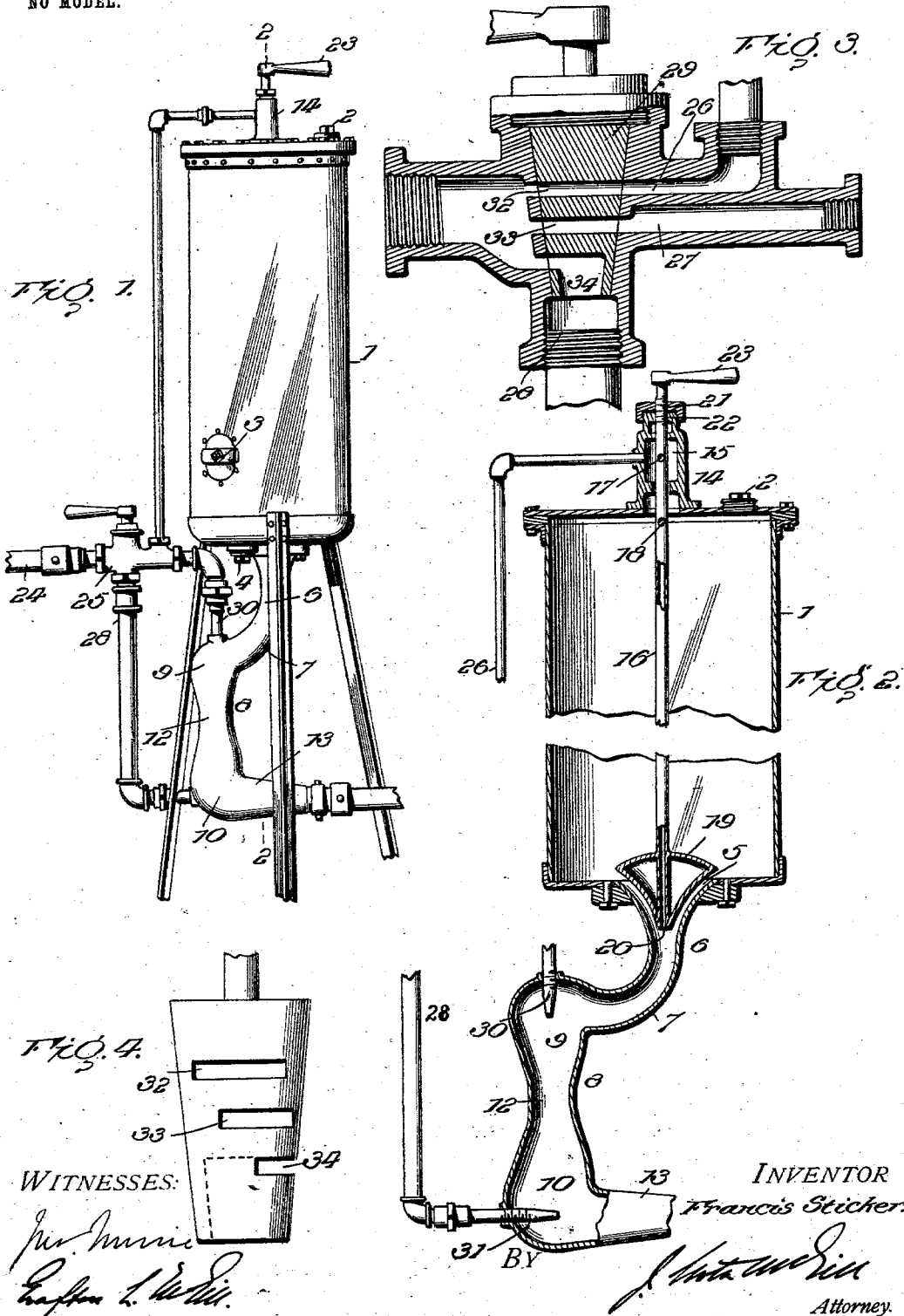
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PATENTED APR. 26, 1904.

F. STICKER.
SAND BLAST.

APPLICATION FILED MAY 29, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

FRANCIS STICKER, OF NEW YORK, N. Y.

SAND-BLAST.

SPECIFICATION forming part of Letters Patent No. 758,118, dated April 26, 1904.

Application filed May 29, 1903. Serial No. 159,354. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS STICKER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sand-Blasts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The primary objects of this invention are the provision of improved means for introducing the compressed air to insure its full force being utilized to act upon and entrain the sand and for so controlling such introduction that the necessary supply of air may be had without unnecessary waste.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation with parts broken away. Fig. 2 is a vertical sectional view. Fig. 3 is a sectional view of the cock and pipe branches. Fig. 4 is a view of the cock in side elevation.

Referring to the drawings, 1 designates a casing constituting the sand-receptacle, suitably mounted and provided with openings 2 3 4 at the top, side, and bottom, designed, respectively, to permit introduction of sand, access to the interior, and emptying of the receptacle. The bottom of the casing is provided with a central outlet 5, in line with which a pipe 6 is secured to the casing. This pipe is of peculiar formation. The end opening into the casing is flared outwardly, and beneath such flared portion the pipe is tapered and bent at about right angles, as at 7. It is then carried downwardly, forming a vertical arm 8, at the upper and lower ends of which are enlarged portions constituting chambers 9 10, the pipe being contracted between the chambers, as at 12. From chamber 10 the pipe is bent horizontally to form an arm 13, which is tapered toward its free end, the enlarged portion of such arm constituting practically a right-angular extension of chamber 10. A hose or other flexible tubing is designed to be attached to arm 13 and held to the work by the operator.

On top of the casing is a casting 14, having a chamber 15.

16 designates a tubular rod vertically disposed within the casing and chamber and having a port 17 at a point within the latter and a series of circularly-arranged ports 18 at a point within the casing and just above the normal level of the sand therein. At its lower end the rod carries a valve 19 of size and formation corresponding to the flared end of pipe 6. The pointed end of the valve has an outlet-port 20 in line with the passageway extending through the tubular rod 16. The rod is threaded at 21 to engage a threaded bushing 22 in casting 14. By means of handle 23 the rod may be turned to regulate the position of valve 19 with relation to pipe 6, and thus control the outlet of sand.

24 designates the supply-pipe leading from an air-compressor. At 25 this pipe diverges into three branches 26 27 28, a cock 29 being located at the point of divergence. The branch 26 extends to the top of the casing and opens into chamber 15. Branch 27 is provided with a vertical portion having a nozzle 30 disposed in the plane of arm 8 of pipe 6 and into chamber 9 thereof, the end of the nozzle extending well into the chamber. Branch 28 carries a nozzle 31, horizontally disposed in the plane of arm 13 and into chamber 10, this nozzle also extending well into its chamber.

The cock 29 is provided with three ports 32 33 34, designed, respectively, to register with branches 26 27 28. As shown, these ports are of such size and relative arrangement that communication may be established between branch 26 and the air-supply while branches 27 and 28 are closed, between branches 26 and 27 and the air-supply while branch 28 is closed, and simultaneously between all the branches and the air-supply.

In operation the receptacle 1 is supplied with sand from a suitable source, the level of the sand being maintained slightly below the ports 18. Rod 16 is then manipulated to regulate the outlet, and air is admitted to branch 26 by a partial turn of the cock. The air passes into chamber 15 and through port 17 into the tubular rod 16, through which lat-

ter it passes downwardly, a portion thereof passing out in jets through ports 18 and creating a forcing or disturbing action on the sand. The balance of the air continues
 5 through rod 16 and valve 19 into pipe 6, the pointed end of the valve being extended into the pipe, creating a suction in the latter, which draws the sand downward from the receptacle and into pipe 6. The results of this suction
 10 action are enhanced by the air-outlet being well in advance of the body of sand and the shape of the sand-passage formed by the walls of the valve and the pipe. When the blast has become established by the air through
 15 branch 26, the cock is further turned to establish communication with branch 27, creating additional introduction of air-pressure. By the described construction of chamber 9 and the arrangement of nozzle 30 with relation
 20 thereto a powerful impetus is given the blast, not only by the forcing action of the air, but the suction produced thereby as well, the enlarged chamber forming a large field of partial vacuum and the contracted portion 12 of
 25 the pipe bringing the blast into the full force of the pressure from the nozzle. Upon further turning the cock to establish communication with branch 27 still greater air-pressure is introduced, the construction and arrange-
 30 ment of the chamber and nozzle and the effect of the blast from the nozzle being similar to that described with reference to branch 27 and nozzle 30.

The advantages of my invention are appar-
 35 ent to those skilled in the art. Practice has demonstrated that when sand is damp it tends to clog and become hard and that under this circumstance the strongest blast, applied only as a forcing or disturbing medium, will fail
 40 to effect the feed of the sand. Suction must be created beneath the body of sand. By my invention not only is the maximum suction force created, but the introduction of pressure is so regulated as to effect a saving of com-
 45 pressed air and its successive action on the blast, whereby any nature of work to which a sand-blast is applicable may be accomplished with an economy of power. It will be espe-
 50 cially noted that the introduction of air is so distributed as to insure a continuous and uniform blast of sand, thus overcoming the tendency heretofore experienced of having the sand and air expelled in alternate ejections.

I claim as my invention—

55 1. In a sand-blast, a sand-receptacle, a pipe leading therefrom having a mixing-chamber, an air-supply leading to said receptacle and chamber, and means for controlling said supply whereby it may be directed only to the re-
 60 ceptacle, or to the receptacle and such chamber.

2. In a sand-blast, a sand-receptacle, a pipe leading therefrom having a series of mixing-
 65 chambers, an air-supply leading to said receptacle and chambers, and means for controlling said supply whereby it may be directed

only to the receptacle, to the receptacle and one of such chambers, or to the receptacle and all of such chambers.

3. In a sand-blast, a sand-receptacle, a pipe leading therefrom having two enlarged por-
 70 tions constituting mixing-chambers and a contracted portion intermediate such chambers, an air-supply having separate connections with said receptacle and each of said cham-
 75 bers, and means for controlling such supply.

4. In a sand-blast, a sand-receptacle, a pipe leading therefrom having two approximately
 80 horizontal portions and an intermediate vertical portion, the latter being enlarged at its ends to form mixing-chambers, an air-supply having branches leading to said receptacle and
 85 chambers, one of such latter branches having a nozzle vertically disposed in the plane of the vertical portion of said pipe and extending into the upper chamber thereof, and the other
 90 of such branches having a nozzle horizontally disposed in the plane of the lower horizontal portion of said pipe and extending into the lower chamber, and means for controlling such
 95 air-supply.

5. In a sand-blast, a sand-receptacle, a discharge-pipe leading therefrom having a series
 100 of mixing-chambers, an air-supply pipe having branches leading respectively to the receptacle and such chambers, and a cock in said supply-pipe having ports designed respec-
 105 tively to register with the branches leading to the receptacle and chambers, the relative arrangement of said ports permitting commu-
 110 nication to be established with the receptacle alone, with the receptacle and one of said chambers, or with the receptacle and all of said chambers.

6. In a sand-blast, a sand-receptacle having
 105 an outlet, a discharge-pipe secured to said receptacle in alinement with said outlet, a valve within said receptacle designed to regulate said outlet, said valve having a passage, a tubular rod to which said valve is secured, means
 110 for adjusting said rod, and means for supplying air thereto.

7. In a sand-blast, a sand-receptacle having
 115 an outlet, a discharge-pipe secured to said receptacle, and a valve within said receptacle designed to project into said pipe, said valve having an air-passage, means for conducting
 120 air to said passage, and means for regulating said valve.

8. In a sand-blast, a sand-receptacle having
 120 an outlet, a discharge-pipe secured to said receptacle and having its adjacent end flared, a valve within said receptacle of approximately conical formation designed to project into said
 125 pipe, said valve having a central passage, an adjustable tubular rod within said receptacle secured to said valve and having its passage in alinement with the passage in the latter, said
 130 rod having inlet and outlet ports, means for adjusting said rod, and means for supplying fluid-pressure thereto.

9. In a sand-blast, a sand-receptacle having an outlet in its bottom and a chamber on its top, a vertically-movable tubular rod extending through said receptacle and chamber having a valve at its lower end designed to regulate said outlet, said valve having a passage-way, said rod being provided with an inlet-port at a point within said chamber, and outlet-ports at a point within said receptacle above the normal level of sand therein, means for raising and lowering said rod, and means for supplying fluid-pressure thereto.

10. In a sand-blast, the combination with the sand-receptacle having an outlet, a discharge-pipe leading therefrom, said pipe having enlarged portions forming mixing-chambers, and a tubular rod having inlet and outlet ports and carrying a valve designed to extend into said pipe and regulate said outlet, said valve having a passage-way, of a pres-

sure-supply pipe having three branches leading respectively to said tubular rod and to said chambers, the nozzles of the branches leading to the chambers being extended into the latter, and a cock in said supply-pipe having ports designed respectively to register with said branches, whereby a partial turn will supply air to said rod, a further turn supply air to one of said chambers, and a still further turn supply air to the other of said chambers, the previously-created supplies being maintained during the establishment of communication with each of said chambers.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANCIS STICKER.

Witnesses:

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FREDERICK S. STITT.