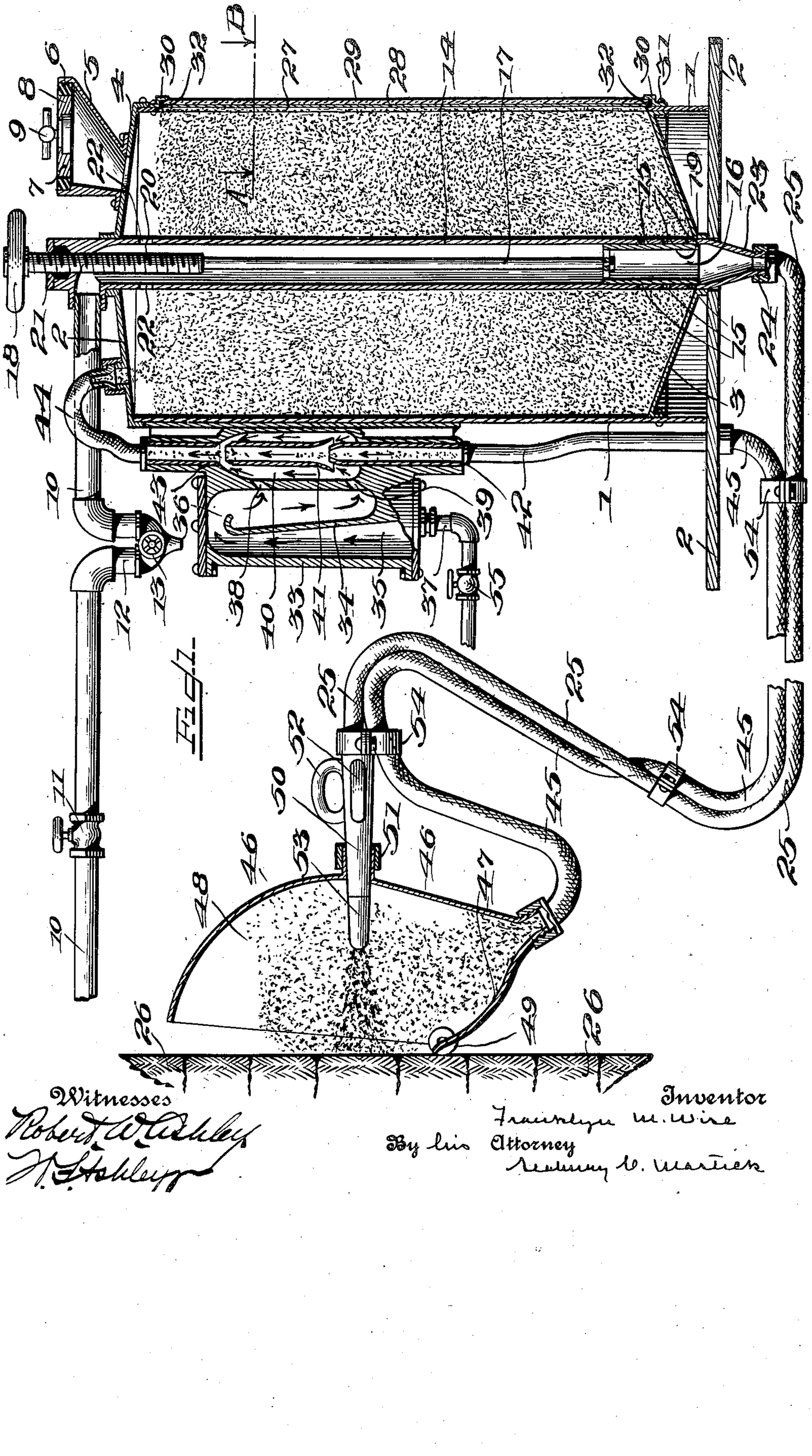
No. 847,269. PATENTED MAR. 12, 1907.

F. M. WISE.

SAND BLAST APPARATUS.

APPLICATION FILED NOV. 10, 1905.

2 SHEETS—SHEET 1.



Witnesses
Robert A. Ashley
F. E. Ashley

Inventor
Frank M. Wise
By his Attorney
Rodney D. Martin

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2 SHEETS—SHEET 2.

Fig. 1.

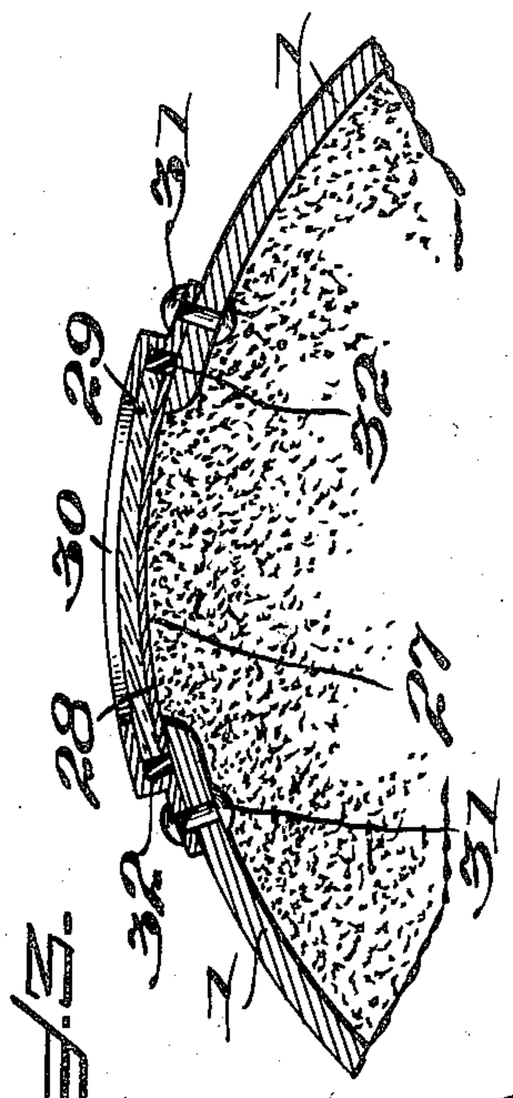

Fig. 2.

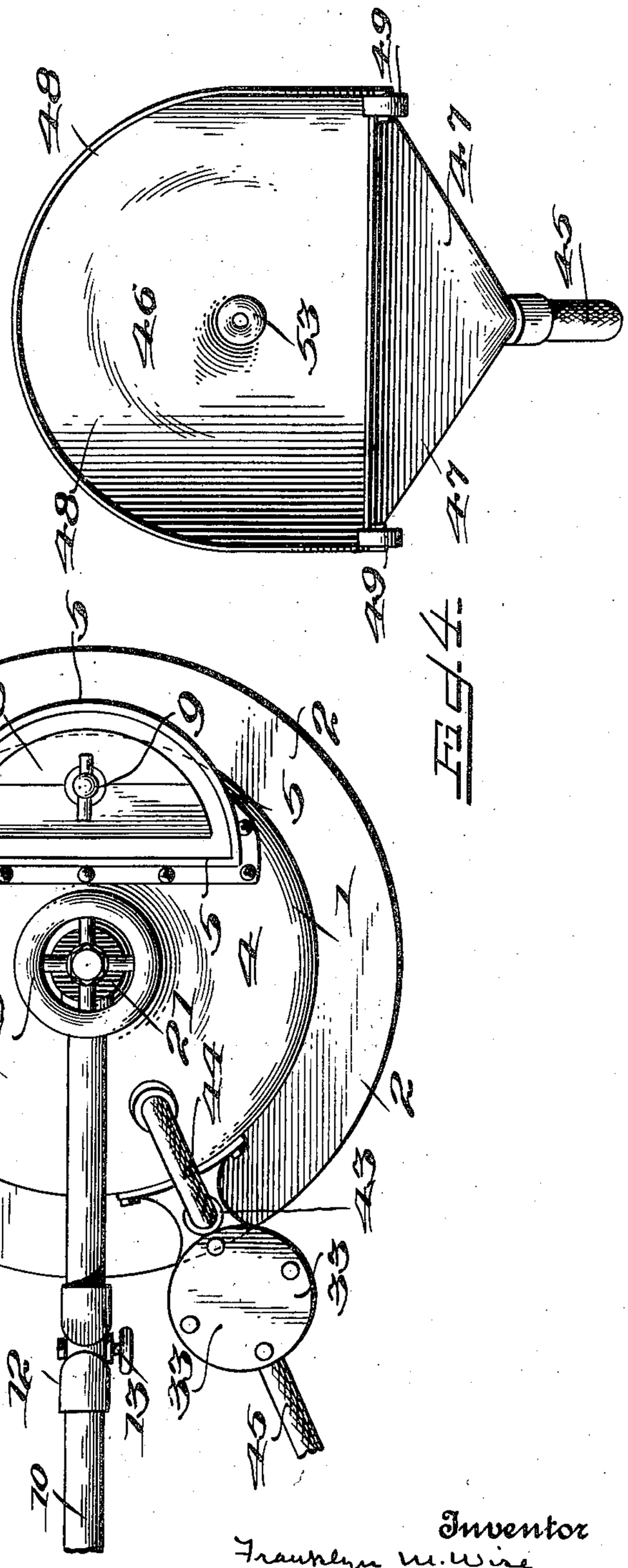

Fig. 3.

Witnesses

Robert W. Ashley

H. E. Ashley

Inventor

Franklyn M. Wise

By his Attorney

Seaburg & Martin

UNITED STATES PATENT OFFICE.

FRANKLYN M. WISE, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN DIAMOND BLAST COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SAND-BLAST APPARATUS.

No. 847,269. Specification of Letters Patent. Patented March 12, 1907.

Application filed November 10, 1905. Serial No. 286,632.

To all whom it may concern:

Be it known that I, FRANKLYN M. WISE, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Sand-Blast Apparatus, of which the following is a specification.

My invention relates to improvements in sand-blast machines of that class particularly adapted for cleaning the surfaces of stone, metal, wood, &c., and has as its object the providing of means for collecting and returning the sand used to the sand-reservoir in connection with means for facilitating the operation of the various parts.

In the following I have described, in connection with the acompanying drawings, one form of device illustrating my invention, the features thereof being more particularly pointed out hereinafter in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of a portable sand-blast machine, illustrating one application of my invention. Fig. 2 is a plan view of the sand-reservoir shown in Fig. 1 and its connections, parts being broken away. Fig. 3 is an enlarged cross-sectional view on the line A B of Fig. 1 and looking in the direction of the arrows, and Fig. 4 is a front elevation of the sand-collector.

Similar numerals of reference indicate similar parts throughout the several views.

1 designates a sand-reservoir comprising a cylinder, preferably of metal, mounted on a base 2, suitably supported and provided with a concave or hopper-shaped bottom 3 and a top or cover 4. Access to the reservoir in order to replenish it with sand is provided for by means of a hopper 5, said hopper having an air-tight cover comprising a rubber gasket 6, with which two cover members 7 and 8 are adapted to engage by means of an expanding-screw 9 to form an air-tight joint.

10 is an inlet-pipe through which the air under pressure is forced into the sand-reservoir, said pipe being controlled by means of a valve 11. A U-shaped bend 12, having a draw-off petcock 13, is provided in the air-inlet pipe to collect such moisture as may be in the air before it reaches the sand-reservoir.

14 is a tube preferably extending vertically through the sand-reservoir and centrally located with relation thereto and projecting through suitable openings in the bottom 3 and cover 4. Near the lower end of tube 14 and just above the bottom 3 of the sand-reservoir a series of vertically-arranged apertures 15 are provided, through which the sand may pass into the mixing-chamber 16 at the lower extremity of tube 14. To regulate the admission of said to the mixing-chamber, tube 14 is provided with a vertically-adjustable valve, said valve comprising a stem 17, having at its upper end a hand-wheel 18 and at its lower end a head or plunger 19, adapted to close apertures 15 when the valve is seated. The stem 17 has an enlarged threaded portion 20, which passes through a suitable stuffing-box 21 in tube 14, the parts being so arranged that by turning hand-wheel 18 the valve is raised and lowered, as desired, opening more or less of apertures 15 and permitting more or less sand to escape into the mixing-chamber.

Tube 14 at its upper end and a little below the cover 4 of the sand-reservoir is provided with apertures 22 of such diameter that they will admit sufficient air into the sand-reservoir to tend to force the sand contained therein downward, but not sufficient to counteract the suction of air from the sand-suction means, as hereinafter described.

The mixing-chamber 16 tapers, as at 23, to form a threaded nipple 24, said nipple being adapted to receive the end of hose 25, which is adapted to convey air and sand to the object to be operated upon, such as wall 26.

A gage or sight is provided at one side of the sand-reservoir 1 in order to observe the contents thereof and comprising an opening 27 in the side of the reservoir, covered by a strip of sheet-mica 28, and a plate-glass member 29, clamped to the side of the reservoir by a grooved plate 30 and rivets 31, a rubber gasket 32 being interposed between the plate 30 and the side edges of sheet 28 and glass 29, as shown in Fig. 3, in order to render the opening 27 into the reservoir air-tight.

At one side of the reservoir is mounted a sand-suction means comprising a cylinder 33, preferably of metal and having a deflector-plate 34, dividing cylinder 33 into two chambers 35 and 36, respectively. Chamber 35 is provided with an air-inlet pipe 37, and chamber 36 is provided with two air-outlets

38 and 39, respectively—one near the top and the other near the bottom of said chamber. Air-outlets 38 and 39 discharge into a suction-chamber 40, in which is suitably supported an auxiliary suction-pipe 41, into which pipe 42 discharges and which in turn discharges into pipe 43, coupled with hose 44, leading into the sand-reservoir. Pipe 42 at its lower end is coupled with hose 45, which is coupled at its outer end to a sand-collector 46, comprising a frame covered with any suitable material, preferably stiffened canvas, hopper-shaped at the bottom, as at 47, and having a hood or deflector 48 at the top. Wheels 49 are provided to assist in readily moving the collector over the wall 26.

The collector 46 is supported on nozzle 50 at the outer end of hose 25 by means of a suitable slip-ring 51. Nozzle 50 is preferably provided with handles 52 and a detachable nose 53. Hoses 25 and 45 may be confined in the same position relative to each other by means of ring-clamps 54. Air-inlet pipe 37 is controllable by means of a suitable valve 55.

The operation of the device is as follows: The reservoir having been filled with sand and the cover of hopper 5 being closed, valve 11 is opened and air under suitable pressure is permitted to pass into the reservoir and into tube 14. Hand-wheel 18 is now turned so as to raise plunger 19 and open one or more of apertures 15, through which the sand will flow into the mixing-chamber 16, assisted by the air-pressure in the reservoir. The sand passing into the mixing-chamber is caught by the air passing down through tube 14, carried through hose 25, and forcibly projected against the face of wall 26. Valve 55 being opened, air under pressure, preferably slightly less than the pressure in air-inlet pipe 10, is permitted to enter chamber 35, whence it passes over deflector-plate 34 and out through outlets 38 and 39 into suction-chamber 40, where it creates a strong suction on pipe 42 and auxiliary suction-pipe 41, tending to suck the sand from collector 46, into which the sand falls after being projected against wall 26, back into the reservoir. This latter operation is generally assisted by gravity, as the discharge-nozzle 50 and collector 46 are frequently in use at a level higher than the reservoir. By the means described little sand is lost, and the machine may be used a considerable length of time without replenishing, involving very considerable economies in operation, as well as great convenience in manipulation.

It is obvious that the arrangement described may be considerably varied from without departing from the spirit of my invention, and I do not restrict myself to any of the details shown.

What I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described the combination of a portable sand-reservoir, a sand-discharge pipe, air-compression means for driving the sand from the reservoir through said pipe, means for collecting and retaining the sand discharged from said pipe and means for automatically returning the sand to the reservoir.

2. In an apparatus of the character described the combination of a portable sand-reservoir, a sand-discharge pipe, air-compression means for driving the sand from the reservoir through said pipe, means for collecting and retaining the sand discharged from said pipe and suction means for automatically returning the sand to the reservoir.

3. In an apparatus of the character described the combination of a portable sand-reservoir, a sand-discharge pipe, air-compression means for driving the sand from the reservoir through said pipe, collecting and retaining means mounted on said pipe for collecting and retaining the sand discharged therefrom and means for automatically returning the sand from the collector to the reservoir.

4. In an apparatus of the character described a sand-suction means comprising a cylinder divided into a plurality of chambers, one of said chambers forming an air-inlet and another an air-outlet, means for deflecting air from one chamber into another and a suction-chamber into which the air-outlet chamber discharges.

5. In an apparatus of the character described a sand-suction means comprising a cylinder divided into a plurality of chambers, one of said chambers forming an air-inlet and another an air-outlet, means for deflecting air from one chamber into another, a suction-chamber into which the air-outlet chamber discharges, an auxiliary suction-pipe in said suction-chamber and means discharging into and from said auxiliary suction-pipe.

6. An apparatus of the character described including a portable sand-reservoir comprising a primary mixing-chamber, a secondary mixing-chamber, air-compression means connected therewith, a sand-discharge pipe connected thereto, a discharge-nozzle on said sand-discharge pipe, and means mounted on said discharge-nozzle for collecting and retaining the sand discharged therefrom.

7. An apparatus of the character described including a portable sand-reservoir comprising a primary mixing-chamber, a secondary mixing-chamber, air-compression means connected therewith, a sand-discharge pipe connected thereto, a discharge-nozzle on said discharge-pipe, means mounted on said discharge-nozzle for collecting and retaining the sand discharged therefrom, and means for

automatically exhausting the said collecting and retaining means.

8. An apparatus of the character described including a portable sand-reservoir comprising a primary mixing-chamber, a secondary mixing-chamber, air-compression means connected therewith, a sand-discharge pipe connected thereto, a discharge-nozzle on said discharge-pipe, means mounted on said discharge-nozzle for collecting and retaining the sand discharged therefrom, means for automatically exhausting the said collecting and retaining means, and means for returning the sand to the primary mixing-chamber.

9. An apparatus of the character described including a sand collecting and retaining means comprising a hopper provided with a deflector-hood and a receiver adapted to surround a discharge-nozzle mounted on a sand-discharge pipe, and means for automatically exhausting said receiver of the contents thereof.

10. An apparatus of the character described including a sand collecting and retaining means comprising a hopper provided with a deflector-hood and a receiver adapted to surround a discharge-nozzle mounted on a sand-discharge pipe, means for automatically exhausting said receiver of the contents thereof and means for returning the contents to the main supply.

11. An apparatus of the character described including a sand collecting and retaining means comprising a hopper provided with a deflector-hood and a receiver adapted to surround a discharge-nozzle mounted on a sand-discharge pipe, means for automatically exhausting said receiver of the contents thereof, means for returning said contents to the main supply, and means mounted on said collecting and retaining means for rendering the same easy to handle.

12. An apparatus of the character described including a portable sand-reservoir adapted to be filled solid with sand, a means for observing the contents thereof comprising a metal frame having mounted therein a sheet of mica said metal frame and sheet of mica being suitably fastened to the casing of said sand-reservoir.

13. An apparatus of the character described including a sand-discharge nozzle comprising a reception member, handles mounted thereon, means for receiving the body of a sand collector and retainer and a detachable nose-piece.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANKLYN M. WISE.

Witnesses:
MAX. S. HAMBURGER,
WILLIAM F. ASHLEY, Jr.