G. F. STEEDMAN.

SAND BLAST APPARATUS.

APPLICATION FILED AUG. 9, 1909.

955,714.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

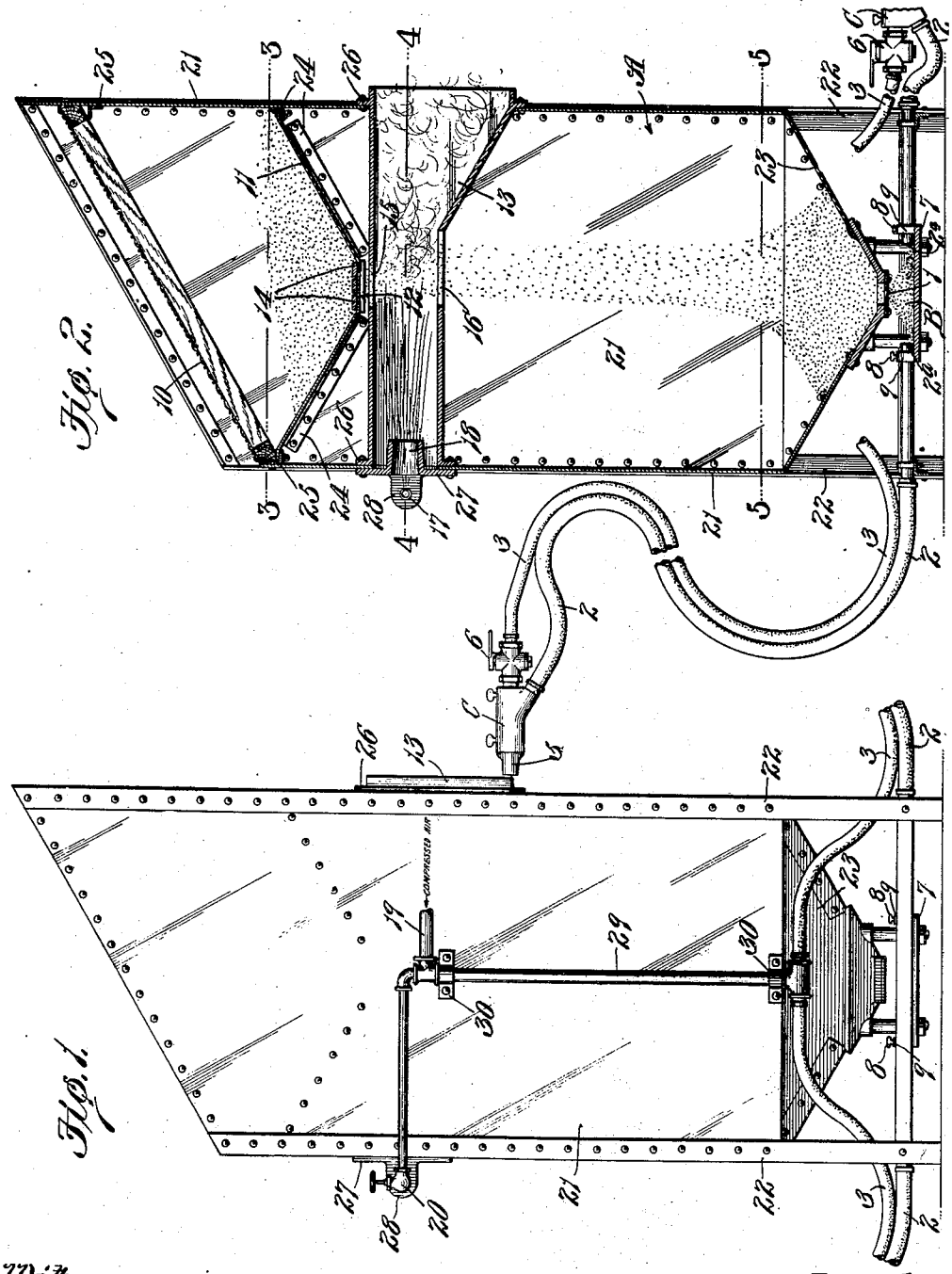


Fig. 2.

Fig. 1.

Witnesses:

George L. Hodson

Nellie L. Church.

Inventor:

George F. Steedman.

By Paul Bakewell Atty.

G. F. STEEDMAN.

SAND BLAST APPARATUS.

APPLICATION FILED AUG. 9, 1909.

955,714. Patented Apr. 19, 1910.

2 SHEETS—SHEET 2.

Fig. 5.

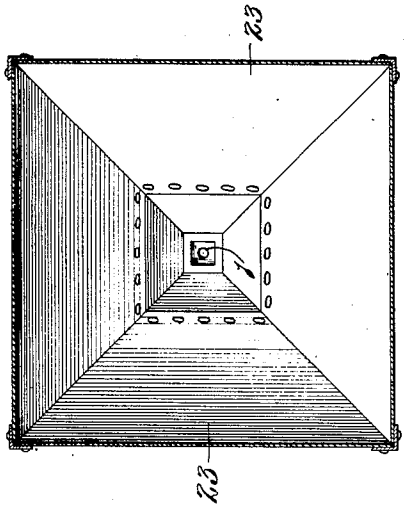


Fig. 6.

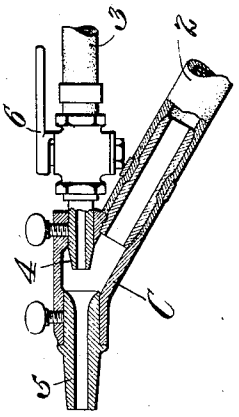


Fig. 3.

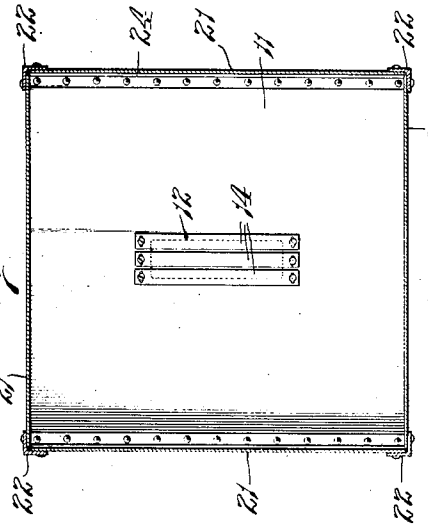
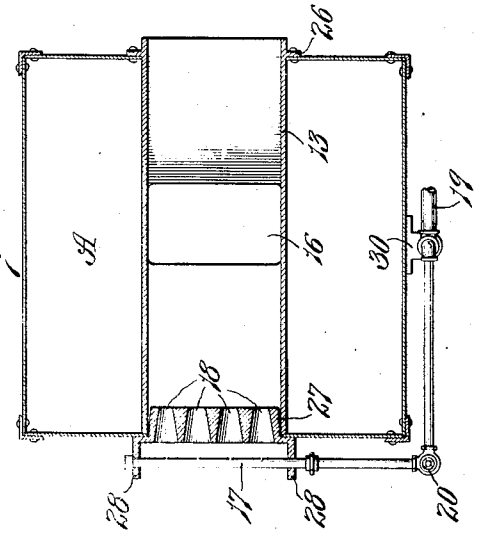


Fig. 4.



Witnesses:

George R. Radson.

Nellie L. Church

Inventor:

George F. Steedman.

By Paul Bakewell Atty.

UNITED STATES PATENT OFFICE.

GEORGE F. STEEDMAN, OF ST. LOUIS, MISSOURI.

SAND-BLAST APPARATUS.

955,714. Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed August 9, 1909. Serial No. 511,940.

To all whom it may concern:

Be it known that I, GEORGE F. STEEDMAN, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Sand-Blast Apparatuses, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sand blast apparatuses such as are used for cleaning castings, buildings and various other objects, and particularly to sand blasts having a hopper open to the atmosphere.

One object of my invention is to provide a dependable supply of sand to the sand nozzle.

Another object of my invention is to be able to regulate the abrading action of the blast.

Another object of my invention is to provide a sand blast of simple construction that can be manufactured at a low cost.

Figure 1 of the drawings is a side elevational view of a sand blast apparatus constructed in accordance with my invention; Fig. 2 is a vertical sectional view of the apparatus shown in Fig. 1; Figs. 3, 4 and 5 are horizontal sectional views taken, respectively, on the lines 3—3, 4—4 and 5—5 of Fig. 2; and Fig. 6 is a longitudinal sectional view of the tool or nozzle to which the sand and air conduits are connected.

Referring to the drawings which illustrate the preferred form of my invention, A designates the sand hopper of my improved sand blast apparatus, and 1 designates a hole or opening in the lower end of said hopper which permits the sand to escape therefrom and form a pile B that constitutes the supply for the sand conduit. The sand conduit 2 and the air conduit 3 are connected to a tool C which is provided with an air nozzle 4 and a sand nozzle 5, a valve 6 of any suitable design being arranged in the air pipe 3, as shown in Fig. 6, for controlling the supply of air.

The terminal 2^a of the sand conduit is located at one side of the sand pile B, as shown in Fig. 2, so that the sand will be sucked in from one side of said pile and drawn up through the sand conduit whenever air is admitted to tool C. The supply pile B, which has a natural surface of repose, is of approximately pyramidal shape or conical shape, and as the sand is drawn from only the side of said pile the supply of sand for the sand conduit will never be exhausted so long as there is any sand in the hopper A, owing to the fact that the sand in the hopper flows downwardly through the opening 1 in the lower end thereof as fast as the sand is sucked from one side of the pile B. The hole 1 is of sufficient area to supply sand to pile B more rapidly than the blast tools can use it.

A plate 7 is preferably spaced away from the hopper practically underneath the opening 1 to carry the supply pile B. It is obvious that this plate could be omitted as the pile B could form on the ground underneath the hopper. For the purpose of preliminary adjustment, the terminal 2^a of the sand conduit is held in working adjustment adjacent to the pile B by means of a set screw 8 in lug 9. When a suction has been created in sand conduit 2 by means of the inspirator action of the air blast in the well-known type of blast tool C, the sand will be sucked from the pile B in proportion to the intensity of the suction existing in the sand conduit 2, and also in proportion to the nearness of terminal 2^a to the surface of supply pipe B.

In order to remove gravel, trash and oversized particles of sand, an inclined screen 10 is provided at the upper opening of the hopper. The material that passes through this screen falls into an inner receptacle formed by plate 11 which has an opening 12 in the bottom registering with an opening 15 in separator box 13. Flat bars of iron 14 almost cover the opening 12 leaving only elongated slots between the bars. The sand and dust contained in the inner hopper formed by plate 11, drops through these slots in thin curtain-like streams and passes through the holes 15 and 16 in the separator box 13. A pipe 17 is held in operative position by lugs 28 on plate 27. Small holes in pipe 17 blow compressed air through conical or funnel-shaped openings 18 which, by the well-known inspirator action, suck in a large volume of air and produce an air current passing through the box 13 which blows out the dust and small-sized particles from the thin sheets of sand passing through the separator box.

The supply of compressed air is brought to the machine by the compressed-air pipe 19; valve 20 regulates or stops the flow of air to pipe 17.

I prefer to make the hopper of my sand blast of sheets of rolled metal 21 riveted to angle uprights 22. The bottom of the hopper is formed by bending sheets 21 to form bottom 23. The inner hopper plate 11 and screen 10 are preferably carried on angles 24 and 25. The separator box 13 is provided with flanges 26 for attaching it to the hopper and plate 27. Pipe 29 conducts the compressed air to the hose 3, and is attached to the hopper by means of a clip 30.

I speak of sand throughout as being the projected medium but any substitute, such as crushed quartz or crushed steel could be substituted.

In previous sand blasts of the same character as my invention it has heretofore been customary to regulate the supply of sand sucked into the sand conduit by means of a sand gate or valve which, according to its area, would permit a greater or less amount of sand to pass into the sand conduit. In my invention I do away entirely with the sand gate, and my entire regulating apparatus consists in bringing the terminal of the sand conduit adjacent to the surface of repose of the sand pile. This produces a feed which is absolutely dependable and which is open to view for ready examination or cleaning. In addition to these benefits my method of sand supply control makes it possible to regulate the amount of sand drawn into the conduit by increasing or decreasing the suction produced in the blast tool. Decreasing the suction at the terminal 2^a decreases the amount of sand drawn into the conduit, or conversely, the greater the suction at the terminal 2^a the greater the amount of sand drawn into the conduit. As the supply of sand is dependent upon the suction I am enabled to provide a sand blast which is regulable by means of the manual valve attached to the sand tool. Whenever this valve is closed no suction is created and the sand pile B has its surface untouched. A small opening of the valve produces a comparatively gentle blast of air and a comparatively gentle suction, and consumes a relatively small amount of compressed air, while a large opening of the valve gives a stronger blast and a greater amount of suction with a corresponding increase in air consumed.

Another benefit of my method of sand supply is that one or more additional blast tools can be operated from the same hopper by placing other sand hose terminals at proper intervals around the sand pile B, as shown in Fig. 2. Two or more men can operate separate blast tools at the same time on the same hopper, each absolutely independent of the operation of the other tools.

On account of economy of operation it is advisable to use the same sand over and over again in a sand blast and as some of the sand becomes pulverized by impact and the material being sand blasted yields up much dust, the sand becomes heavily charged with dust. This dust has no cleaning action and is very disagreeable and injurious to the health of the operator. In the device herein shown this dust nuisance is largely done away with when the sand is charged into the hopper without any extra handling of the sand or loss of time.

I am aware that minor changes in the design can be made and do not limit myself to the actual details shown.

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

1. In a sand blast apparatus, a sand hopper provided with a discharge opening, a support arranged adjacent said opening for receiving the sand that flows from the hopper, said support being exposed on all sides to the atmosphere, a blast tool, and a sand conduit connected to said tool and having its opposite end terminating at a point some distance from the center of said support so as to prevent the sand which collects on said support from completely closing the end of said conduit.

2. In a sand blast apparatus, a sand hopper provided with a discharge opening, a support arranged adjacent said opening for receiving the sand that flows therefrom, a blast tool, a sand conduit communicating with said tool and having one of its ends terminating far enough away from the discharge opening of the hopper that the sand which collects on the support will not completely close the terminal or open end of said conduit, and adjustable means for clamping said sand conduit in operative position.

3. In a sand blast apparatus, a sand hopper having a tapered bottom that is provided with a discharge opening, a plate arranged under said opening and exposed on all sides to the atmosphere for receiving the sand that flows from the hopper, a sand conduit whose end terminates between the edge of said plate and the pile of sand that forms thereon, and a blast tool communicating with the opposite end of said conduit.

4. In a sand blast apparatus, a sand hopper provided with a discharge opening, a flat support arranged adjacent said opening for receiving the sand that flows therefrom, a sand conduit whose end terminates between the edge of said support and the center thereof, and a blast tool communicating with the opposite end of said conduit.

5. In a sand blast apparatus, a sand hopper having a tapered bottom that is provided with a discharge opening, standards or legs which support said hopper, a flat plate arranged under the discharge opening of the hopper and exposed on all sides to the

atmosphere, a blast tool, a sand conduit communicating with said tool and having its opposite end terminating adjacent the edge of said plate, and means on said plate for holding the terminal of said conduit in operative position.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 2nd day of August 1909.

GEORGE F. STEEDMAN.

Witnesses:
VERA REGIS,
G. B. MARTIN.