May 23, 1933. L. D. PEIK 1,910,497

SAND BLAST GUN

Filed Jan. 2, 1930 3 Sheets-Sheet 1

Fig. 1

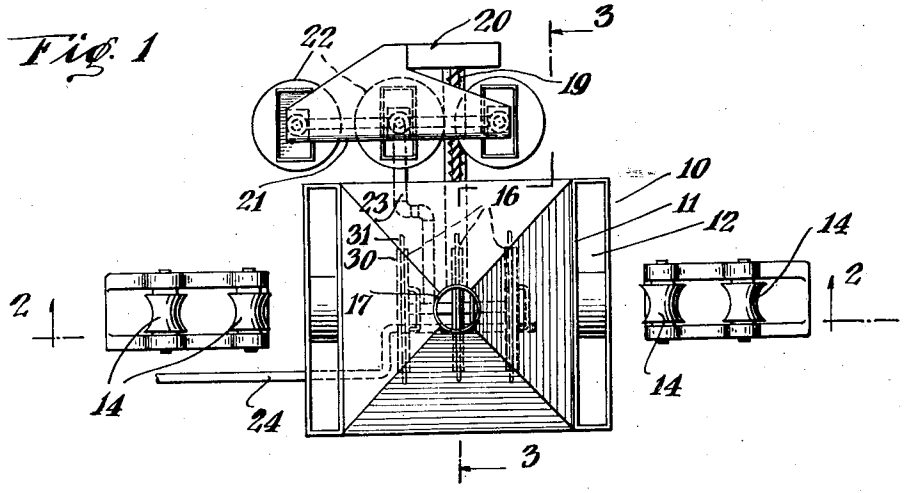


Fig. 2

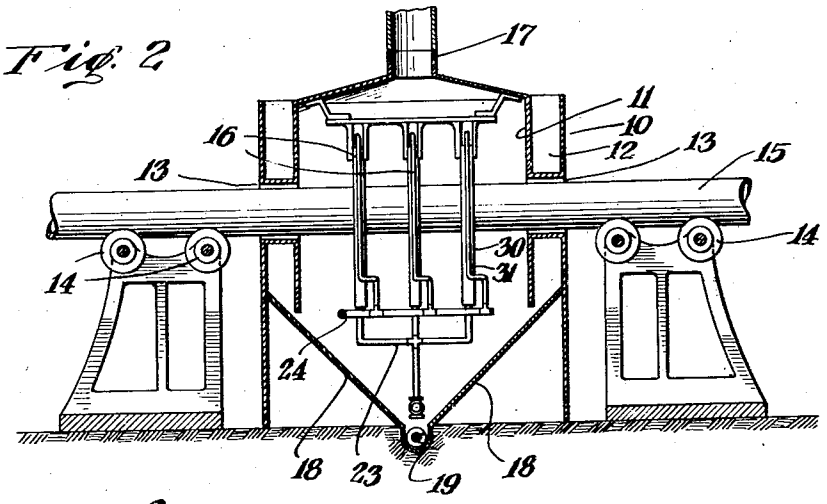
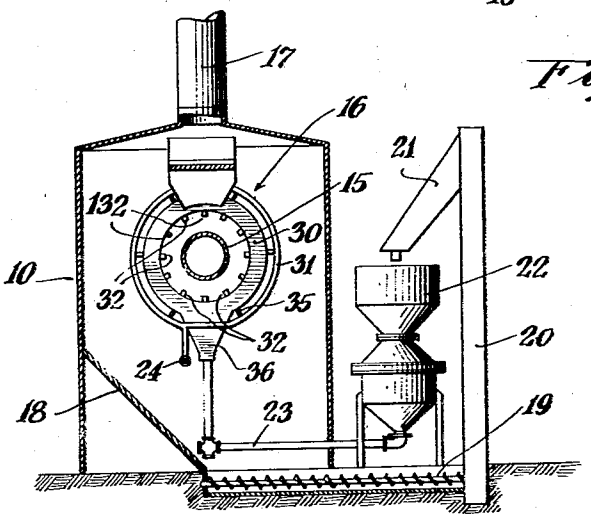


Fig. 3



INVENTOR
Louis D. Peik
BY Albert M. Gratton
ATTORNEY

May 23, 1933. L. D. PEIK 1,910,497

SAND BLAST GUN

Filed Jan. 2, 1930 3 Sheets-Sheet 2

Fig. 4

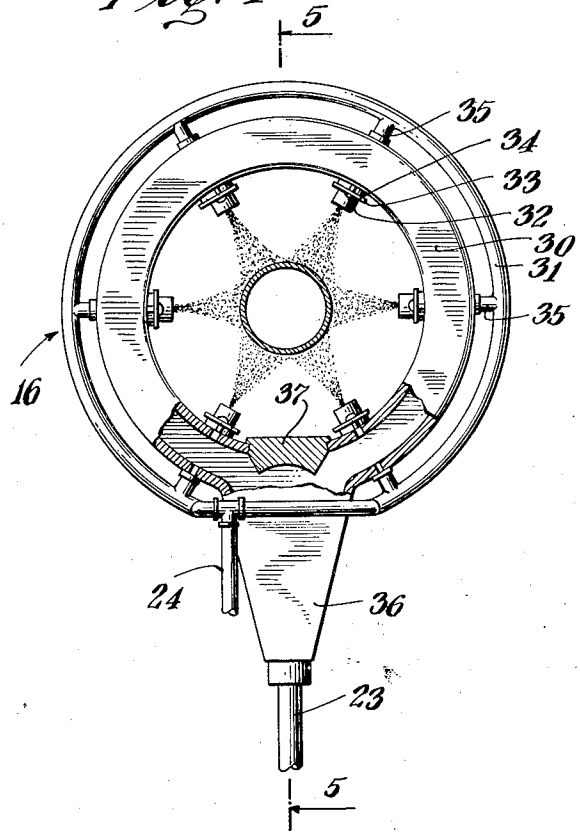


Fig. 5

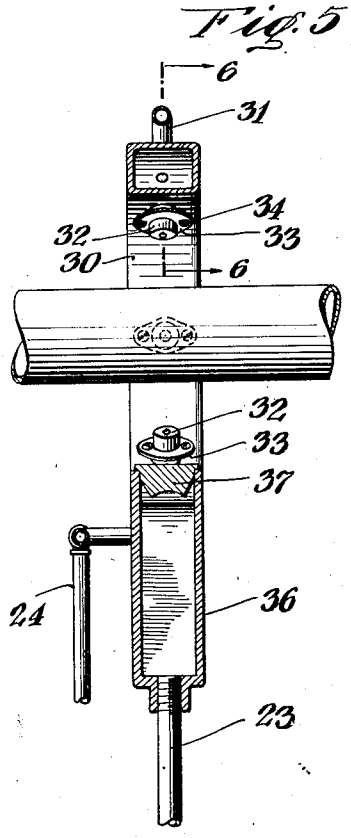
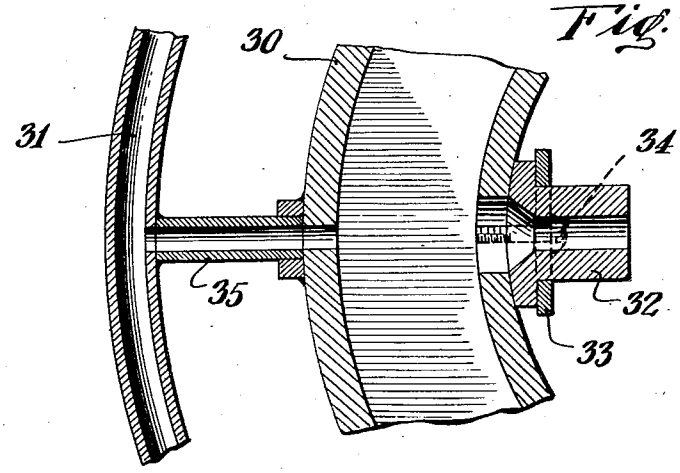


Fig. 6



INVENTOR

Louis D. Peik

BY Albert M. Austin

ATTORNEY

May 23, 1933. L. D. PEIK 1,910,497

SAND BLAST GUN

Filed Jan. 2, 1930 3 Sheets-Sheet 3

Fig. 7

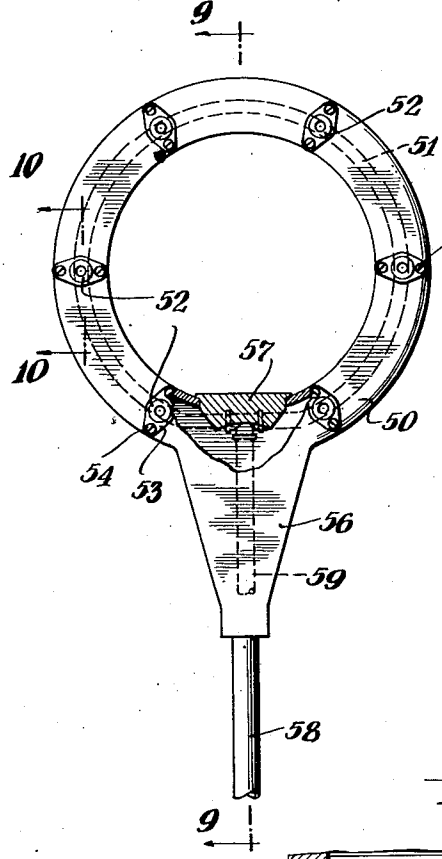


Fig. 8

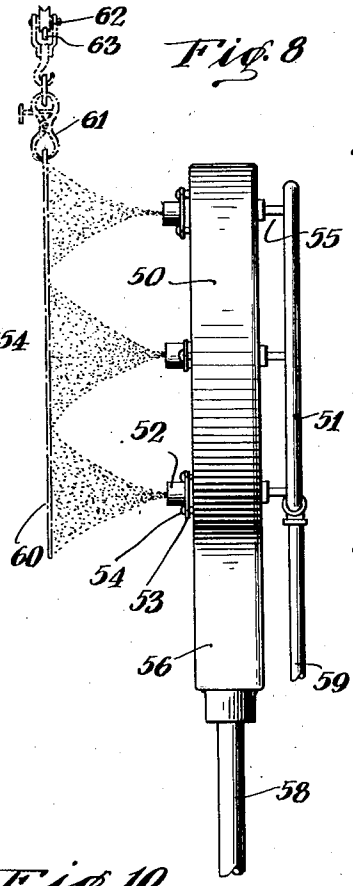


Fig. 9

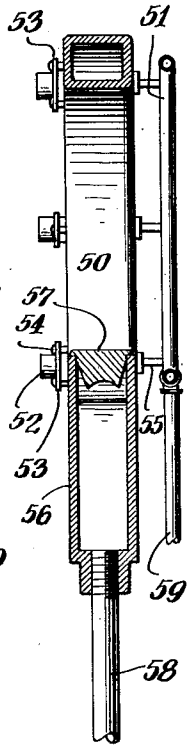
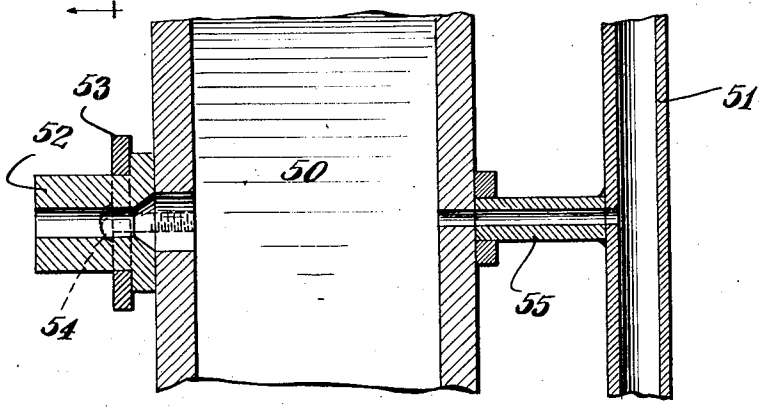


Fig. 10



INVENTOR
Louis D. Peik
BY Albert M. Austin
ATTORNEY

Patented May 23, 1933 1,910,497

UNITED STATES PATENT OFFICE

LOUIS D. PEIK, OF MISHAWAKA, INDIANA, ASSIGNOR TO THE AMERICAN FOUNDRY EQUIPMENT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

SAND BLAST GUN

Application filed January 2, 1930. Serial No. 417,948.

The invention relates to the art of sand blasting or scrubbing rough surfaced objects, such as castings, sheet metal and the like.

According to the invention a series of guns may be provided, each gun comprising a set of annular conduits or hollow rings. One conduit may have nozzles connected thereto for delivering the sand or other abrasive to the work. This conduit may be supplied with the abrasive carried by a current of air. The other conduit may supply pure air to assist in imparting a high velocity to the abrasive issuing from the nozzles. The nozzles may be radially disposed and directed toward the center of the rings and the work may be passed through the rings. If desired, a plurality of guns may be used and the nozzles on the several guns may be staggered to assist in attaining a more uniform blasting action. On the other hand, if desired, the nozzles may be disposed parallel to the axis of the rings and a number of guns may be placed in the same plane to scrub a flat object, such as a sheet of metal. A suitable housing having a support for feeding the work to the nozzles may be provided and also suitable means for recovering the spent abrasive and for conducting away the dust.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 is a plan view illustrating a sand blast apparatus according to the invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a detail of one of the guns with parts broken away;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a detail taken on the line 6—6 of Fig. 5;

Fig. 7 is a view of a modified form of gun;

Fig. 8 is a view at right angles to the view in Fig. 7 illustrating the relation of the work to the gun;

Fig. 9 is a section on the line 9—9 of Fig. 7; and

Fig. 10 is a section on the line 10—10 of Fig. 7.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

Referring now to the drawings and more particularly to Figs. 1 to 3, inclusive, the apparatus is shown as comprising a housing 10 made up of a suitable framework (not shown) which supports the walls enclosing the sand blast chamber. Disposed within the sand blast chamber is a plurality of guns 16 supported by suitable supporting structure, preferably from the framework of the housing 10. The work, which is shown for purposes of illustration as a large pipe 15, is supported upon suitable rollers 14 and passes through the walls of the housing 10 and through the center of the ring shaped guns 16 as shown. Suitable sealing devices may be provided for sealing the housing 10 at 13 where the work passes through the housing walls.

Inner walls 11 are provided to form air intake ducts 12, and at the top of the housing 10 an outlet duct 17 is provided for withdrawing the dust resulting from the cleaning or blasting action.

The bottom of the housing 10 is provided with inclined walls 18 leading to a trough in which is disposed a worm conveyor 19. The worm conveyor communicates with a bucket elevator indicated by 20, which in turn communicates with a distributing hopper indicated by 21, which feeds the sand to continuous pressure tanks 22 where the sand or other abrasive is picked up by air and fed to the guns 16 through the supply pipe 23.

The air passing through the supply pipe 23 carries the sand particles in suspension and thus the mixture of air and sand fed by pipe 23 to the guns 16 is said to be carbureted.

Referring now to Figs. 4, 5 and 6, each gun 16 comprises a ring or annular manifold 30 and an outer ring 31. The outer ring 31 is connected to a supply pipe 24 which is connected to a source (not shown) of pure air under pressure.

The manifold 30 has a plurality of nozzles 32 disposed on its inner wall and directed radially inwardly. Each nozzle is clamped in position by a collar 33 fitting over a shoulder on the nozzle and secured to the manifold 30 by screws 34. A plurality of connecting conduits 35 extend from the outer ring 31 to the outer wall of the manifold 30 and are placed in line with the nozzles 32, as shown.

Also connected to the manifold 30 is a tapered conduit 36 which connects with the feed pipe 23 which leads to the pressure tanks 22, as above described, for supplying a mixture of abrasive and air to the manifold 30. The manifold wall has a target plate 37 for receiving the impact of the air and sand passing through the conduit 36 and assisting in spreading this material around the manifold 30.

If desired, the manifolds 16 may be arranged with their nozzles 32 in staggered relation, as illustrated in Fig. 3, where the nozzles on one gun are represented by 32 and the nozzles on the next gun by 132. This is for the purpose of more evenly distributing the sand blast over the surface of the work 15 if it is found desirable.

In operation, the supply of air and sand through the pipe 23 and the air alone through the pipe 24 is turned on and the work 15 fed through the housing 10 and through the middle of the guns 16, as indicated, the nozzles 32 impressing a scouring and scrubbing spray of sand and air on the work, as shown particularly in Fig. 4. The spent abrasive falls to the bottom of the housing, collecting in the trough where it is conveyed by the screw conveyor 19 to the elevator 20, whence it is elevated to the troughs 21 and delivered to the pressure tanks 22.

The provision of feeding a mixture of sand and air to the manifold 30 and pure air only to the manifold 31 results in providing a blast of increased force and efficiency, and the disposition of the nozzles in a ring assists in a more even distribution of the blasting action. It is only necessary in some cases to pass the pipe 15 or other work through the housing 10 and blasting guns 16 once and the work can be thoroughly scrubbed and cleaned.

Referring now to Figs. 7 to 10, inclusive, the gun shown herein comprises a manifold 50 for a mixture of air and abrasive and a second manifold 51 for air only. The manifold 50 is provided with a conical or tapered conduit 56 connecting with supply pipe 58 for supplying a mixture of air and sand. The manifold 51 is connected with supply pipe 59 for supplying pure air under pressure.

The nozzles in this species are denoted by 52 and are circularly disposed and are pointed in a direction parallel to the axis of the rings 50 and 51. These nozzles 52 are connected with the manifold 50 by collars 53 and screws 54 in a manner similar to the nozzles 32 described above. Connecting conduits 55 connect the manifolds 50 and 51 and are disposed in line with the nozzles 52, as shown particularly in Fig. 10.

A target plate 57 is provided for distributing the sand and air around the manifold 50 in the same manner as described in connection with target plate 37 above.

The work is illustrated as a piece of sheet material 60 held by one or more clamps 61 suspended from one or more pulleys 62 riding on a trolley 63. It will be understood that as many guns of this species as necessary may be provided side by side in the same plane to clean the work. Also, if desired, they may be placed on opposite sides of the work so that both sides of the work may be cleaned at the same time. It will be understood that the work and guns will be placed in a suitable housing and the guns will be connected with the supply of air and sand in a manner similar to that described in connection with Figs. 1 to 6, inclusive.

The operation of the construction shown in Figs. 7 to 10, inclusive, will be obvious from the description of the operation of the form shown in Figs. 1 to 6, inclusive. The guns have the advantage of increased efficiency and increased force of blasting, and in many cases it is sufficient to pass the nozzles but once in order to thoroughly clean the work of scale and other undesirable matter.

While certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. An abrasive blast gun comprising a first, annular conduit adapted to have a mixture of abrasive and air supplied thereto, a second, annular conduit for clean air, a plurality of nozzles connected to said first conduit, and connecting conduits extending from said second conduit to said first conduit substantially in line with said nozzles, respectively.

2. An abrasive blast gun comprising a first, annular conduit, a tapered conduit hav-

ing its larger end connected to said first conduit and adapted to have a mixture of abrasive and air supplied to the smaller end thereof, a target member in said first conduit opposite said tapered conduit to spread the abrasive and air, a second, annular conduit for clean air, a plurality of nozzles connected to said first conduit, and connecting conduits extending from said second conduit to said first conduit substantially in line with said nozzles, respectively.

3. An abrasive blast gun comprising a first, annular conduit adapted to have a mixture of abrasive and air supplied thereto, a second, annular conduit for clean air, a plurality of radial nozzles connected to the inner wall of said first conduit, and radial connecting conduits extending from said second conduit to said first conduit substantially in line with said nozzles, respectively.

4. An abrasive blast gun comprising a first, annular conduit, a radial, tapered conduit having its larger end connected to the outer wall of said first conduit and adapted to have a mixture of abrasive and air supplied to the smaller end thereof, a target member on the inner wall of said first conduit opposite said tapered conduit to spread the abrasive and air, a second, annular conduit for clean air surrounding said first conduit, a plurality of radial nozzles connected to the inner wall of said first conduit, and radial connecting conduits extending from said second conduit to the outer wall of said first conduit substantially in line with said nozzles, respectively.

5. An abrasive blast gun comprising a first, annular conduit, a tapered conduit having its larger end connected to the wall of said first conduit and adapted to have a mixture of abrasive and air supplied to the smaller end thereof, a target member in said first conduit opposite said tapered conduit to spread the abrasive and air, a second, annular conduit for clean air, a plurality of radial nozzles connected to the inner wall of said first conduit, and radial connecting conduits extending from said second conduit to said first conduit substantially in line with said nozzles, respectively.

6. In abrasive blast apparatus, a chamber, an annular abrasive blast gun disposed in said chamber, supports to allow work to pass through the chamber and through said annular gun, said gun comprising a first, annular conduit, means for supplying a mixture of air and abrasive to said conduit, a plurality of radial nozzles secured to the inner wall of said conduit, a second, annular conduit, means supplying clean air to said second conduit, said second conduit communicating with said first conduit opposite each of said nozzles.

7. In abrasive blast apparatus, a chamber, a plurality of annular abrasive blast guns disposed vertically in said chamber, supports to allow work to pass through the chamber and through said annular guns, each gun comprising a first, annular conduit, means for supplying a mixture of air and abrasive to said conduit, a plurality of radial nozzles secured to the inner wall of said conduit, a second, annular conduit, means supplying clean air to said second conduit, said second conduit communicating with said first conduit opposite each of said nozzles, the nozzles on one gun being staggered with respect to another gun.

8. In abrasive blast apparatus, a chamber, an abrasive gun disposed therein, supports to allow work to pass said gun, nozzles on said gun directed on said work while it passes thereby, and means for supplying said gun with abrasive and carrying fluid, said chamber having a dust outlet at the top and an air inlet opening at the top to the outside and extending to the lower part of the chamber.

9. In abrasive blast apparatus, a chamber having sloping bottom walls forming a trough, air inlet conduits opening from the outside at the top of said chamber and extending close to said sloping bottom walls at both sides of the trough, means for supplying abrasive to said chamber, means for exposing work to the action of the abrasive and an outlet conduit in the top of said chamber between said inlet conduits.

In testimony whereof I have hereunto set my hand and seal.

LOUIS D. PEIK.