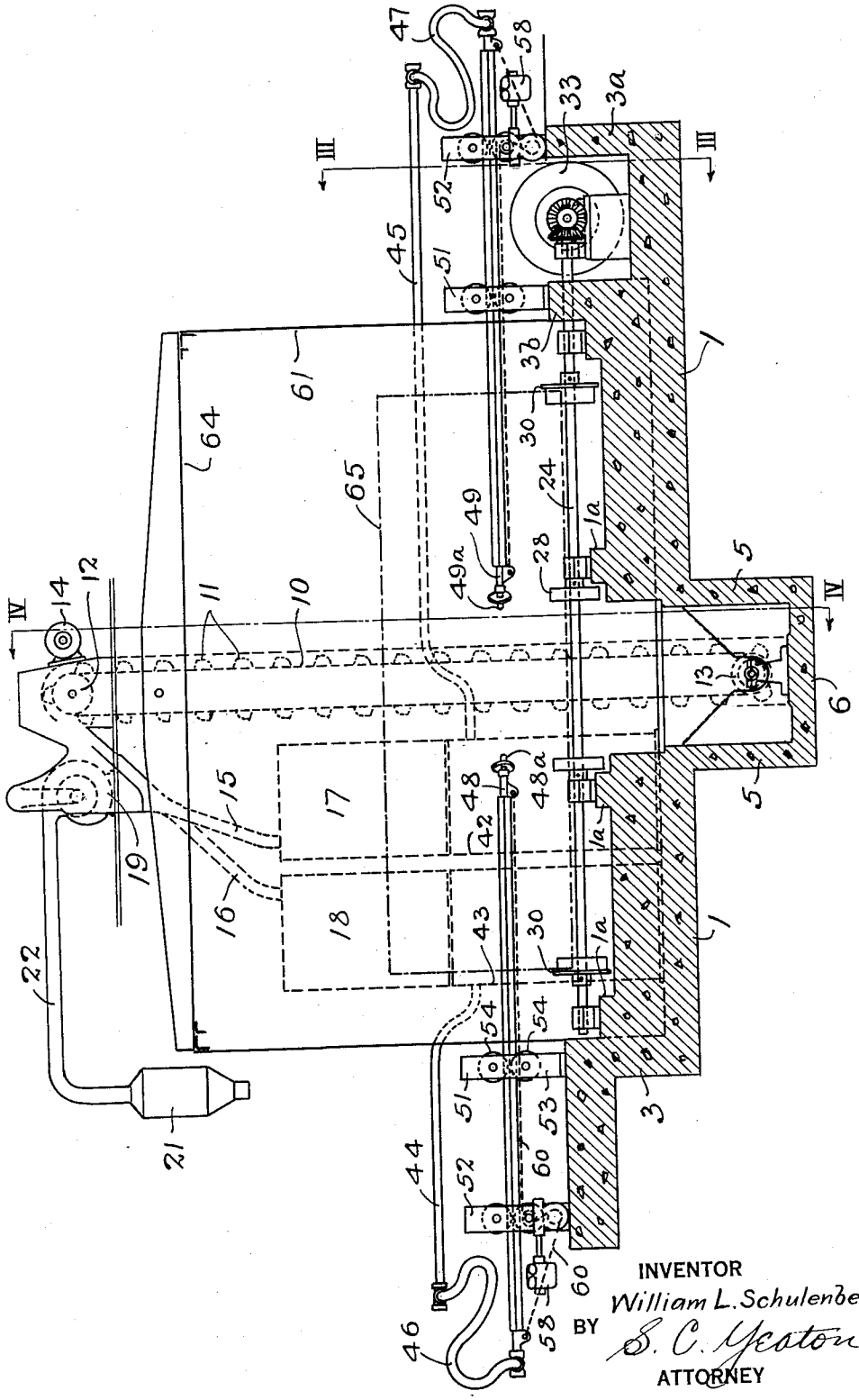
Nov. 21, 1933. W. L. SCHULENBERG 1,935,956

SAND BLASTING APPARATUS

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-FIG. 1.-

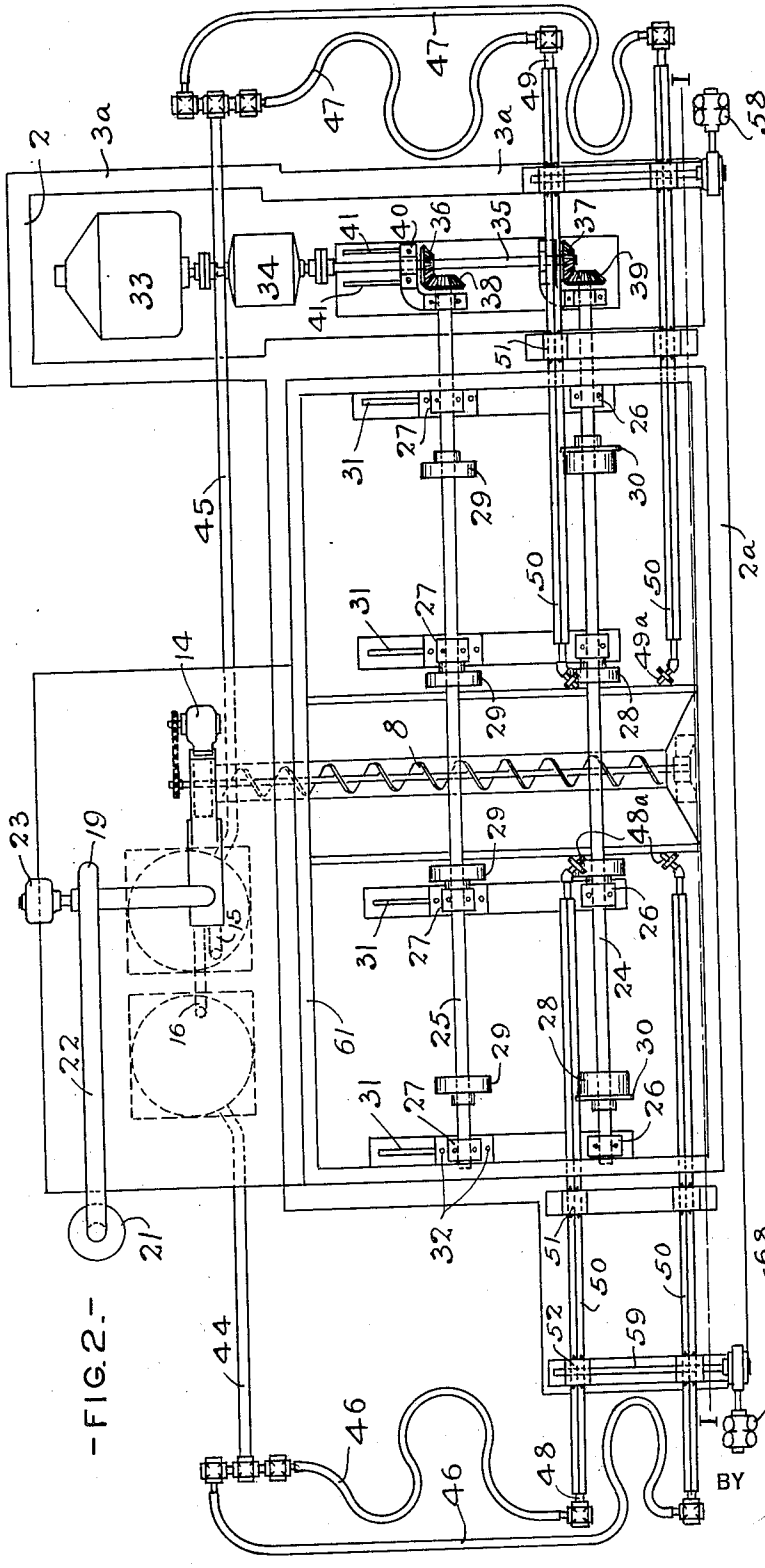


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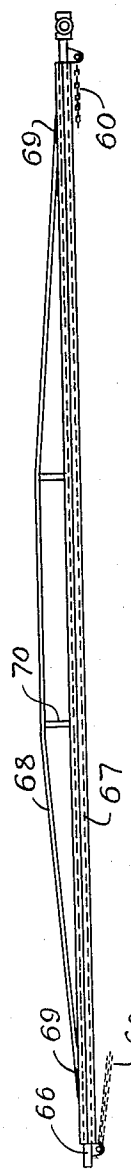
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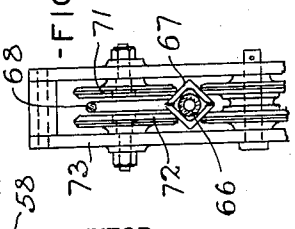
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-FIG. 2.-



-FIG. 7.-



-FIG. 8.-

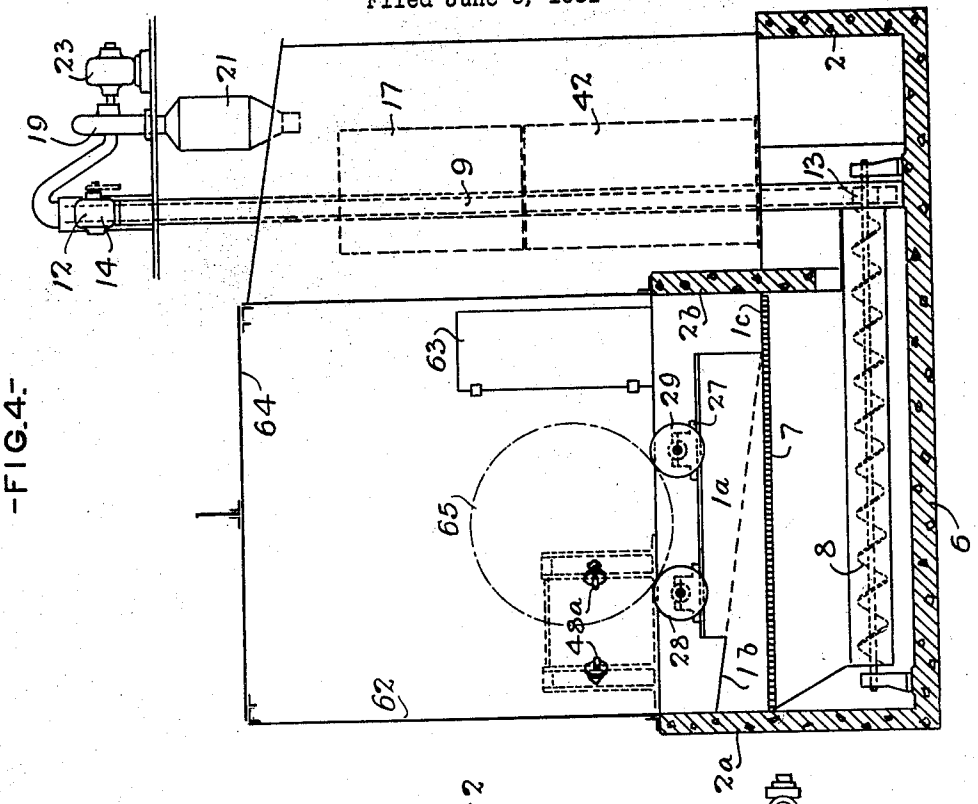
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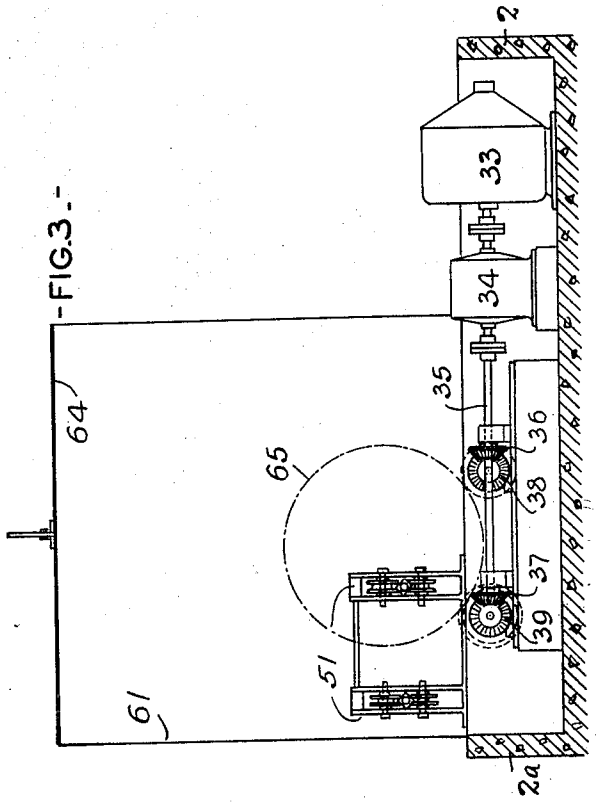
SAND BLASTING APPARATUS

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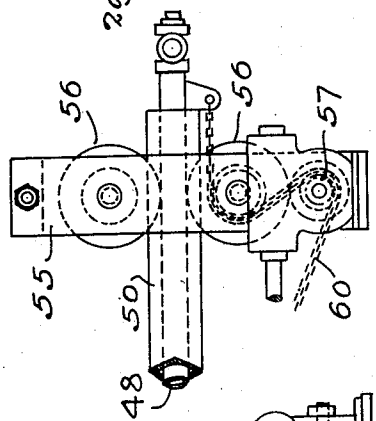
-FIG.4.-



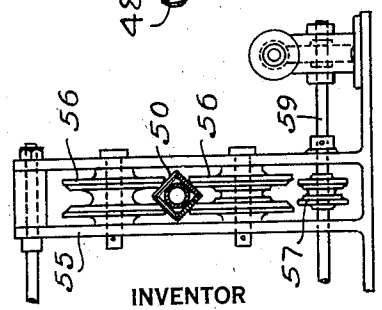
-FIG.3.-



-FIG.5.-



-FIG.6.-



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UNITED STATES PATENT OFFICE

1,935,956

SAND BLASTING APPARATUS

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Application June 9, 1931. Serial No. 543,084

3 Claims. (Cl. 51—14)

This invention relates to sand blasting apparatus. An object of the invention is to provide an apparatus for sand blasting pipes and other cylindrical objects, which will comprise an efficient motor operated mechanism for mechanically moving the work to be treated and the movable units of the blasting apparatus. Other and further objects of and advantages achieved by the instant invention will be apparent from the following description of a preferred embodiment of the invention.

In the accompanying drawings Figure 1 is a longitudinal sectional view of the foundation and housing of the instant invention, with the mechanism of the invention shown in elevation; Fig. 2 is a plan view of Fig. 1, with the housing cover removed; Fig. 3 is a section on the line III—III of Fig. 1; Fig. 4 is a section on the line IV—IV of Fig. 1; Fig. 5 is an enlarged side view of the bearing and feeding mechanism for one of the sand blast pipe constructions; Fig. 6 is an end view of Fig. 5; Fig. 7 is a side view of a modified form of sand blast pipe construction embodying a strengthening truss rod; and Fig. 8 is an enlarged end view of a modified form of bearing for the blast pipe construction of Fig. 7.

Referring in detail to the drawings, the foundation for the structure of the instant invention comprises concrete flooring, indicated generally by the numeral 1, front and rear walls 2 and 2*a*, respectively, an intermediate wall 2*b*, parallel to the front and rear walls, side walls 3 and 3*a*, an intermediate wall 3*b*, between the side walls and parallel thereto, a supporting floor outwardly extending from the upper end of the wall 3, and upwardly extending supporting projections 1*a*. The top of the flooring 1, slopes at 1*b*, from the rear wall 2*a*, toward the wall 2*b*, leaving a horizontal portion 1*c*, adjacent the wall 2*b*. A pit is centrally formed in the flooring 1, between the walls 3 and 3*b*, transversely across the foundation. The pit comprises downwardly extending side walls 5 and a floor 6 connecting the side walls. The front and rear walls 2 and 2*a* extend downward to the floor 6, at the front and rear ends of the pit. A perforated floor plate 7 is disposed across the top of the pit between the walls 2*a* and 2*b*, and a worm conveyor 8 of usual construction is supported on the floor 6.

At the rear end of the conveyor a belt bucket elevator 9 is provided. The elevator 9 is of usual construction comprising a rubber belt 10, having buckets 11, attached thereto, and is carried by an upper pulley 12 and a lower pulley 13. A motor 14 is provided adjacent the upper pulley 12 and is geared thereto for driving it. The lower pulley 13 is keyed to the shaft of the worm conveyor 8, so that the motor 14 simultaneously operates both the elevator and conveyor. Spouts 15 and 16, for conveying abrasive, are extended from the upper end of the elevator downwardly to a pair of abrasive separators and cleaners 17 and 18 of usual type and construction which are supported on blast tanks 42 and 43, hereinafter more fully described, between the walls 2 and 2*b*. A dust exhauster 19 is mounted adjacent the upper ends of the spouts 15 and 16. The dust exhauster is of a well known type and operates to remove dust and fine particles from the abrasive as it leaves the elevator. A separator 21 is connected to the exhauster 19 by a duct 22. The separator is likewise of a well known type, and acts to exhaust the free air into the atmosphere and deposit the solids in a suitable receptacle (not shown) beneath the separator. A motor 23 is engaged with the exhauster for operating the same.

A pair of horizontal parallel shafts 24 and 25 are mounted in bearings 26 and 27 respectively, which are supported on the projections 1*a* of the floor of the foundation. Rollers 28 and 29 are keyed to the shafts 24 and 25 respectively, the outer rollers on the shaft 24 being provided with flanges 30 and being longitudinally adjustable on said shaft. The bearings 27, are held in slotted guides 31, by bolts 32, and are adapted to be moved in said guides for the lateral adjustment of the shaft 25. A motor 33 is provided between the walls 3*a* and 3*b*. The motor 33 is geared to a speed reducer 34, which drives a shaft 35 having bevelled gears 36 and 37 keyed thereto. The gears 36 and 37 mesh with bevelled gears 38 and 39 respectively, which are keyed to the adjacent ends of the shafts 25 and 24. This end of the shaft 25 is carried in a bearing 40, which is held by bolts in slotted guides 41, so that the bearing 40 is adjustable with the bearings 27. The bevelled gear 36 is slidably adjustable on the shaft 35 so as to be maintained in mesh with the gear 38, when the shaft 25 is laterally adjusted. The rollers 28 and 29 are thus adapted to be rotated by the motor 33, in all of their relative adjusted positions.

Beneath the separators and cleaners 17 and 18 are disposed sand blast tanks 42 and 43, respectively, which are connected together and are of the usual type and construction. The tanks are supplied with air under pressure in the usual

manner (not shown), receive the abrasive from the tanks 17 and 18, and feed the abrasive to pipes 44 and 45, respectively connected thereto. The pipes 44 and 45 extend to the outer ends of the apparatus, and are respectively connected to hoses 46 and 47. The opposite ends of the hoses are respectively connected to pairs of sand blast pipes 48 and 49 having nozzles 48*a* and 49*a* of ordinary type and construction fitted at their free ends. The pipes of each pair are spaced apart so that their nozzles will be disposed, one adjacent the inner side and one adjacent the outer side, of a pipe 65 to be treated, hereinafter referred to.

Each of the sand blast pipes is covered by a metal housing 50 (Figs. 5 and 6) which is square in cross-section. Each pipe and its housing is supported by an inner bearing 51 and outer bearing 52. The bearings are supported on the foundation of the apparatus. The inner bearings comprise yokes 53 in which spaced bearing wheels 54 are journalled, the sand blast pipes and the housings being passed between the bearing wheels 54 and held in position by their bearing faces. The outer bearings 52 embody feed mechanism for the sand blast pipes. The outer bearings (Figs. 5 and 6) comprise yokes 55 in which spaced bearing wheels 56 are journalled similarly to the bearing wheels 54 in the yokes 53 and the sand blast pipes and their housings also pass between the bearing wheels 56 and are held in position thereby.

Chain drive wheels 57 are journalled in the yokes 55 beneath the lower bearing wheels 56. At each end of the apparatus, a reversible motor 58 is provided. The chain drive wheels 57 for both of the outer bearings 52 at each of the opposite ends of the apparatus are keyed to common shafts 59 and the shafts 59 are geared to their adjacent motors 58. At the opposite ends of each of the blast pipes, chains 60 are connected, the chains passing over the lower bearing wheels 56 and around the chain drive wheels 57 of the outer bearing in each instance, so that the motors 58 will move the sand blast pipes and their housings inwardly and outwardly through their bearings, accordingly as the motors are driven forwardly or in reverse.

An enclosure indicated generally by the numeral 61 is supported on the foundation and surrounds the roller mechanism. The enclosure comprises four walls 62 and is provided with a suitable door 63 and a removable cover 64. Openings in the end walls of the enclosure permit the passage therethrough of the sand blast pipes 48 and 49. A suitable crane (not shown) is provided for removing the cover 64 and for lifting the pipe or object 65 to be operated upon, into and out of position within the housing.

In Fig. 7 there is illustrated a modified form of sand blast pipe and housing structure. In this instance the blast pipe 66 is of relatively great length. It is provided with a housing 67 similar to the housing 50 and a strengthening truss 68 is welded to its opposite ends at 69, and connected thereto intermediate the ends by struts 70.

In Fig. 8 there is illustrated a modified form of bearing for the structure illustrated in Fig. 7. Here the lower bearing wheel is the same as the lower bearing wheel 56 of the bearing 52, but the upper bearing wheel means comprises two separate bearing wheel portions 71 and 72 which are separately journalled to the sides of the bearing yoke 73 and leave a space between them through which the truss rod of the modified form of blast pipe and housing structure is permitted to pass. Where the truss rod embodiment of the blast pipe is used the upper bearing wheel means in both the inner and outer bearings will both be of the modified construction last described.

In the operation of the apparatus the cover 64 of the housing will first be removed by the crane, and the pipe 65 to be sand blasted will be lifted to working position on the rollers 28 and 29, the end rollers on the shaft 24, and the shaft 25 having been previously adjusted to suitable relative positions according to the dimensions of the pipe. The cover 64 will then be replaced on the enclosure and the motor 33 will be started, the rollers 28 and 29 being turned thereby and the pipe 65 being rotated around its longitudinal axis. The flanges 30 on the outer rollers of the shaft 24 will prevent creep or longitudinal movement of the pipe 65 during its rotation. The motors 14 and 23 will likewise be started thus causing the worm 8, the elevator 9 and the dust exhauster 19 to be brought into operation. The tanks 42 and 43 will be supplied with compressed air in the usual manner and the abrasive will be fed to the nozzles. The motors 58 will then be started and the blast pipes and their nozzles will be moved inwardly and outwardly, that is to say, when the nozzles have travelled from the outer ends of the pipe inwardly to the center of the pipe, the motors 58 will be reversed and the pipes and their nozzles will travel outwardly back again to the outer ends of the pipe, the operation being repeated until the pipe has been blasted to the extent desired. The nozzles at each end of the apparatus being disposed one on the inside of the pipe and one on the outside, both the inner and outer surfaces of the pipe will be blasted at the same time. The used abrasive will be swept or otherwise suitably deposited into the pit. The worm 8 will carry used abrasive collected in the pit to the elevator 9 which in turn will deliver the same to the tanks 17 and 18, while dust collector draws off the useless fine particles of the abrasive or dust at the top of the conduits 15 and 16, and delivers the fine particles or dust to the separator 21 which discharges the free air to the atmosphere and the solids separated therefrom to the container beneath the same.

While there has been hereinbefore described specific embodiments of the instant invention it will be understood that many and various changes in procedure and details of construction may be made by those skilled in the art without departing from the spirit of the invention, and that all and any such changes and modifications as fall within the scope of the appended claims are contemplated as a part of the instant invention.

The invention claimed and desired to be secured by Letters Patent is:

1. An abrasive blasting apparatus comprising means for movably supporting an object to be treated; a source of abrasive; a blasting pipe adjacent said supporting means, connected with said source; a nozzle at an end of said pipe; a housing around said pipe, substantially square in cross section; a support for said pipe comprising a pair of spaced aligned rollers adapted to engage said housing; and means connected with said housing for longitudinally moving said pipe and housing between said rollers to vary the position of said nozzle.

2. An abrasive blasting apparatus comprising means for movably supporting an object to be treated; a source of abrasive; a blasting pipe ad-

jacent said supporting means, connected with said source; a nozzle at an end of said pipe; a housing around said pipe, substantially square in cross section; a support for said pipe comprising a pair of spaced, aligned rollers adapted to engage said housing; a chain connected at its ends with said housing; and a chain drive wheel operably engaging said chain for longitudinally moving said housing and pipe to vary the position of said nozzle.

3. An abrasive blasting apparatus comprising means for movably supporting an object to be treated; a source of abrasive; a blasting pipe adjacent said supporting means, connected with said source; a nozzle at an end of said pipe; a housing around said pipe, substantially square in cross section; a support for said pipe comprising a pair of spaced aligned rollers adapted to engage said housing; a chain connected at its ends with said housing; a chain drive wheel operably engaging said chain for longitudinally moving said housing and pipe to vary the position of said nozzle; and a reversible motor operably engaged with said chain drive wheel.

WILLIAM L. SCHULENBERG.