March 13, 1934. P. H. BEST 1,951,008

ABRASIVE BLAST CLEANING MACHINE

Filed March 23, 1932 4 Sheets-Sheet 1

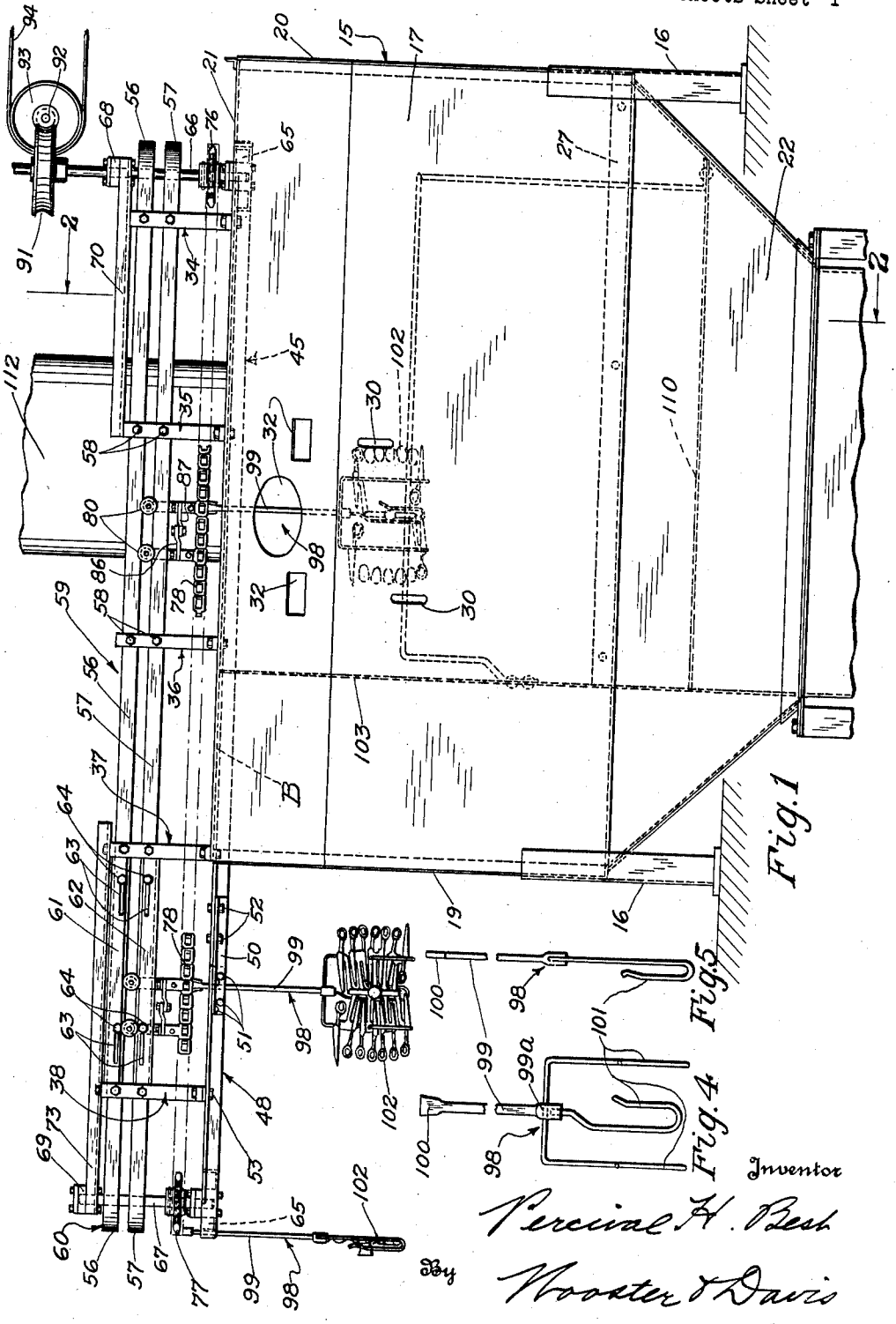


Fig. 1

Fig. 5

Fig. 4

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ABRASIVE BLAST CLEANING MACHINE

Filed March 23, 1932 4 Sheets-Sheet 2

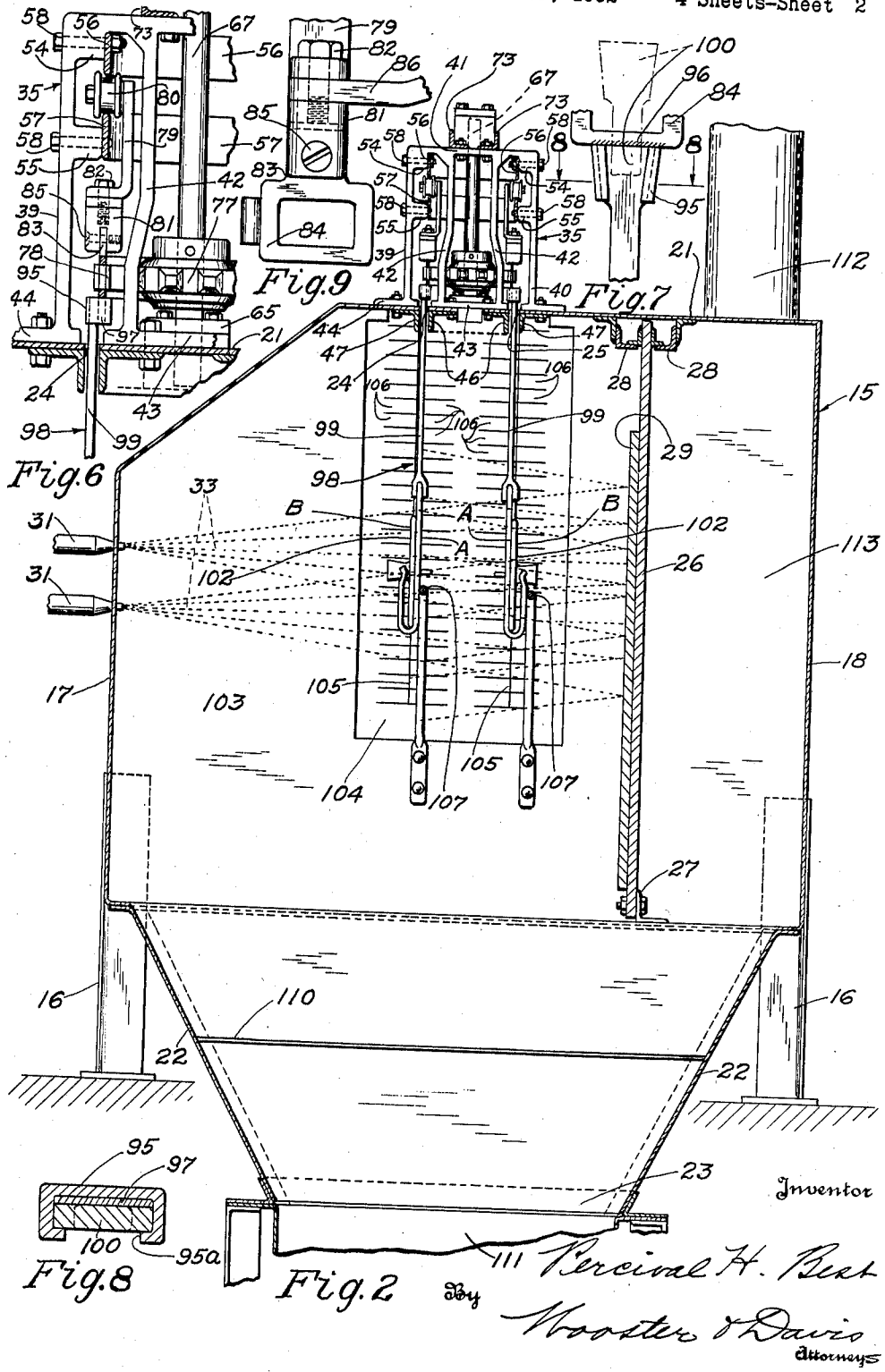


Fig.6 Fig.9 Fig.7 Fig.8 Fig.2

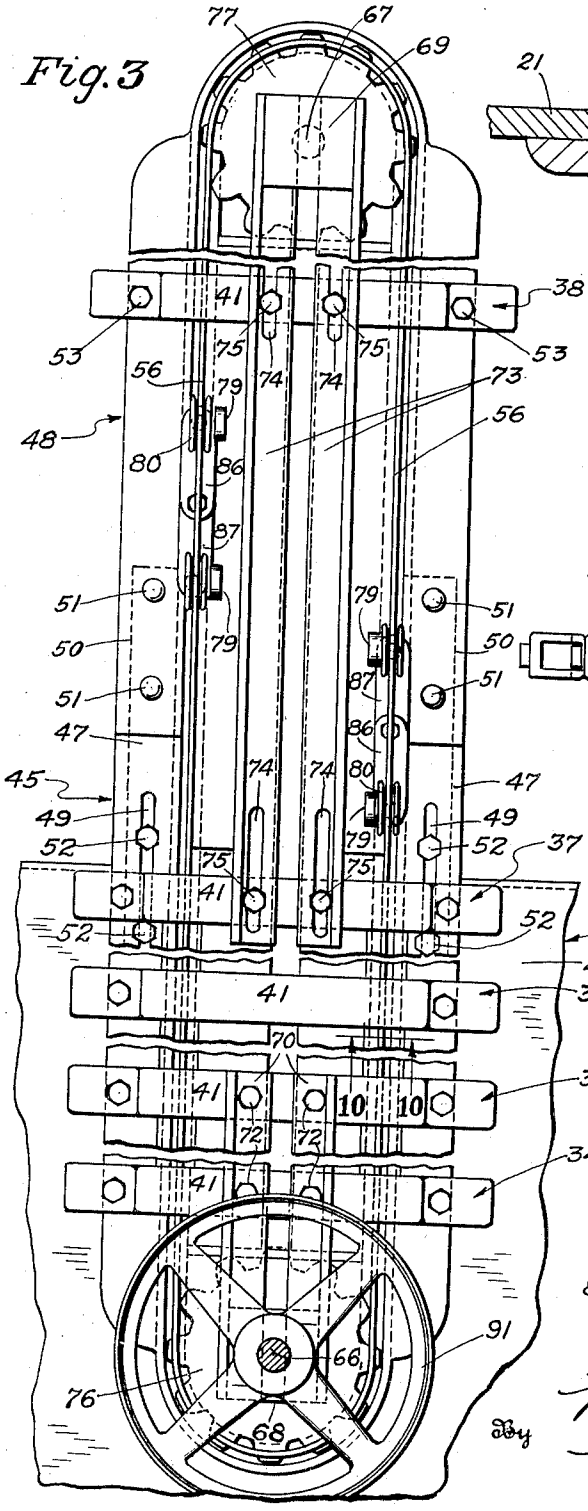
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ABRASIVE BLAST CLEANING MACHINE

Filed March 23, 1932 4 Sheets-Sheet 3

Fig. 3



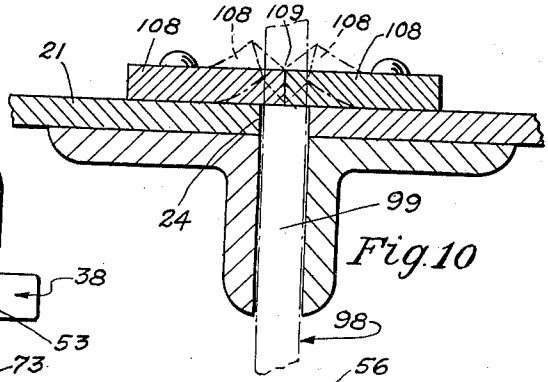


Fig. 10

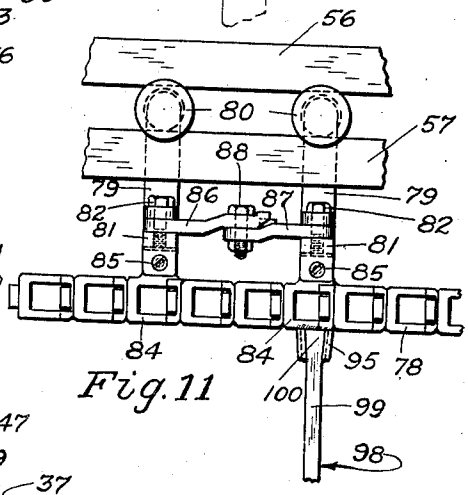


Fig. 11

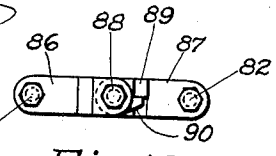


Fig. 12

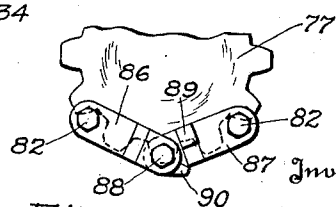


Fig. 13

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ABRASIVE BLAST CLEANING MACHINE

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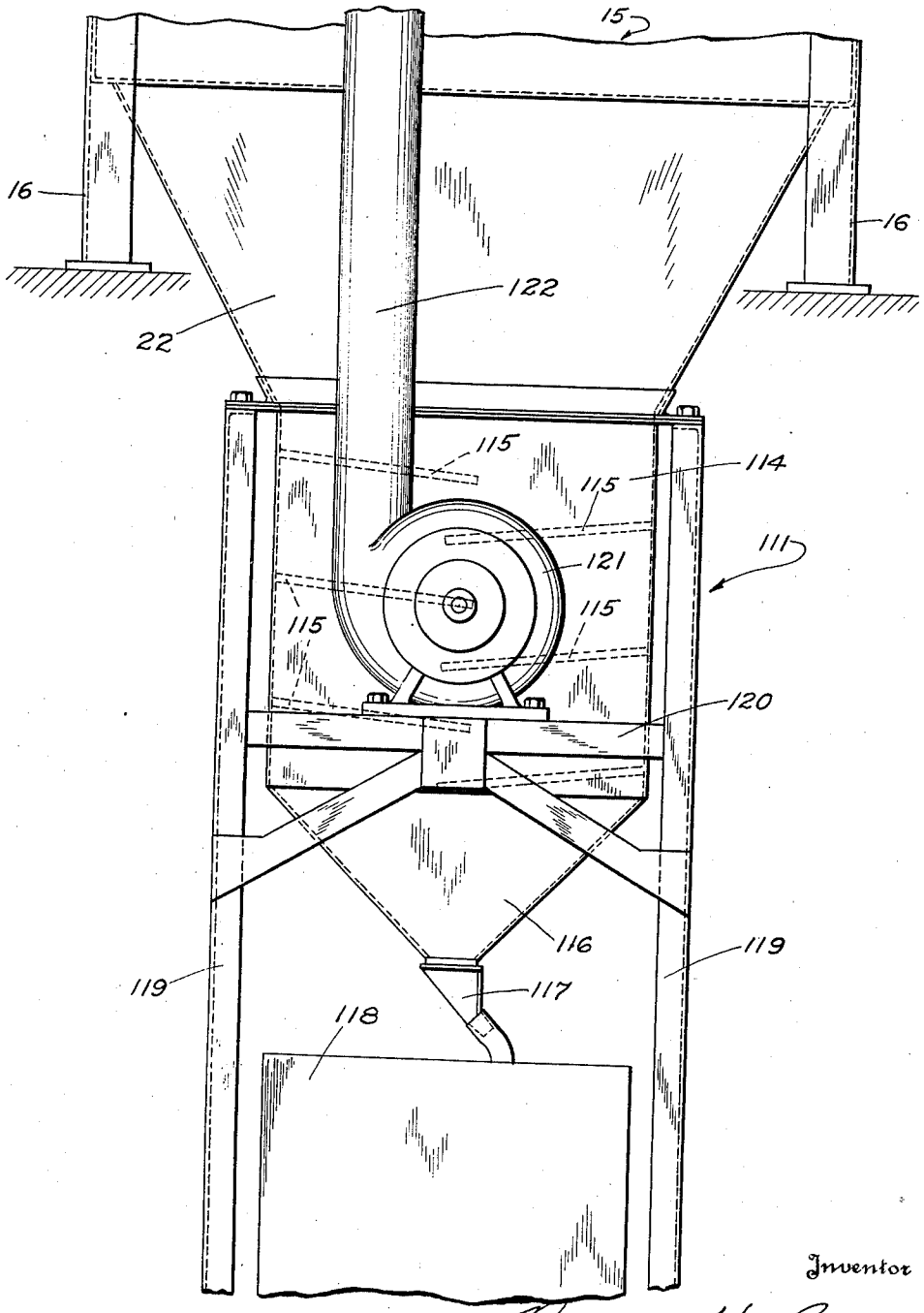


Fig 14

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UNITED STATES PATENT OFFICE

1,951,008

ABRASIVE BLAST CLEANING MACHINE

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Application March 23, 1932, Serial No. 600,646

17 Claims. (Cl. 51—14)

This invention relates to new and useful improvements in sand blast apparatus and has particular relation to a sand blasting machine for cleaning castings.

An object of the invention is to provide a sand blasting machine including a cabinet, a conveyor for carrying articles to be cleaned into and out of the cabinet, and means directing a sand blast against the articles while they are in the cabinet in such a way as to simultaneously clean both sides of the castings.

It is also an object of the invention to provide a construction and an arrangement whereby the castings are carried through the sand blast with one side directed toward the blast, and are then turned through a half revolution and carried back through the blast with the other side turned toward it.

A further object is to provide a machine in which comparatively fragile articles can be cleaned with practically no breakage.

Another object is to provide a machine as stated and which is easy to operate it being only necessary for the operator to place the articles to be cleaned on and remove them from a conveyor, and which is of simple construction whereby it may be economically built and operated at a low cost.

A further object is to provide a machine as stated and which is so constructed that workmen employed about the machine will not be troubled with dust from the machine and which includes means whereby the used sand is cleaned and recovered for further use.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein an embodiment of the invention is shown. It will, of course, be understood that the drawings and description are for the purpose of making clear the principles of the invention and that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a front elevational view of a complete machine in accordance with the invention;

Fig. 2 is a sectional view taken substantially along the line 2—2 of Fig. 1.

Fig. 3 is a top plan view on an enlarged scale, parts being omitted;

Fig. 4 is a front elevational view of a supporting means or hook employed in the machine;

Fig. 5 is an edge view of the supporting means or hook;

Fig. 6 is an elevational detail view on an enlarged scale showing a portion of a supporting frame;

Fig. 7 is a front elevational view on an enlarged scale showing the connection between the conveyor and a supporting hook;

Fig. 8 is a sectional view taken substantially along the line 8—8 of Fig. 7;

Fig. 9 is an elevational view on an enlarged scale showing a portion of the conveyor means;

Fig. 10 is a sectional view on an enlarged scale, the view being taken substantially on the line 10—10 of Fig. 3;

Fig. 11 is a front elevational view on an enlarged scale and showing a portion of the trolley or supporting means for the conveyor;

Fig. 12 is a plan view of a link means connecting parts of the trolley means of Fig. 11;

Fig. 13 is a detail view showing said link means as the portion of the conveyor to which it is attached passes about a sprocket wheel; and

Fig. 14 is an elevational view showing a sand cleaning and recovering means.

Referring in detail to the drawing, the improved sand blasting machine as herein disclosed includes a cabinet 15 supported as by legs or uprights 16 and comprising front and rear walls 17 and 18, end walls 19 and 20, a top wall 21 and an inclined bottom wall 22 open at its lower end as at 23 (see Fig. 2). The entire cabinet may be constructed of a relatively heavy gauge sheet metal the parts being riveted, welded or otherwise secured together as desired. The top wall of the cabinet is provided with a somewhat U-shaped slot the arms of which are designated 24 and 25, the said arms opening through the end 19 of the cabinet and the said arms at their inner ends being connected whereby a means (to be described) may enter one arm of the slot and travel through the slot leaving it by the other arm.

Within the cabinet opposite the front wall 17 thereof there is mounted a stop or baffle plate 26 of steel or the like said plate being secured at its bottom edge as to the angle member 27 and at its upper edge being mounted between the angle members 28 as fully shown in Fig. 2. To the front side of this plate there is secured a sheet of rubber 29 the purpose of which will later more fully appear. A pair of openings 30 are shown in the wall 17 and these openings are adapted to accommodate sand blast nozzles 31 as shown. This side of the cabinet may also be provided with observation openings 32 closed as by heavy glass or the

like to prevent the escape of dust into the atmosphere about the machine. Of course, the nozzles 31 are connected with suitable apparatus whereby air under pressure and sand are supplied to the nozzles which are adapted to direct a sand blast suggested at 33 toward the rubber pad or sheet 29 and the invention includes means for carrying articles to be cleaned through said sand blast and then out of the cabinet. This means includes suitable frame members 34, 35, 36, 37 and 38 which while all of the same or substantially the same construction are given separate designating characters for the purpose of clarifying the description. The frame members each include a pair of outer upright portions or legs 39 and 40 connected at their upper ends as by a cross piece 41 from which depends a pair of spaced bars or members 42 connected at their lower ends as by a cross piece 43. By reference to Figs. 1, 2 and 6 it will be noted that the outer legs 39 and 40 of the frame members 34, 35, 36 and 37 are provided with foot portions 44 disposed on the wall 21 of the cabinet at the outer sides of the portions 24 and 25 of the slot. Also, it will be noted that the portion 43 of these frame members is disposed against the top wall of the cabinet between the arms of the slot. To the inner surface of the top wall 21 of the cabinet there is secured a base member 45 including four angle iron sections comprising an inner pair of sections 46 and an outer pair 47, the inner sections being bolted to the cross piece 43 of the frame members 34 through 37 while the outer pair are bolted to the foot pieces 44 of said members, the said angle iron sections being so spaced apart as to assist in defining the slot through the wall 21 of the cabinet. The outer ends of the angle iron sections of the base member 45 are connected with the ends of corresponding sections of a base member 48. The members 45 and 48 are adjustable relatively and to this end the angle iron sections of the member 47 are provided with elongated slots 49 while the sections of the member 48 are provided with extensions 50 riveted or otherwise secured to them as at 51 and carrying bolts 52 operating in the slots 49.

The outer frame member 38 is secured to the base member 48 as by bolts 53 and these frame members each include inwardly directed lugs or extensions 54 and 55 against the inner ends of which are secured track members 56 and 57 as by means of bolts 58. These track members 56 and 57 are upper and lower track members and are spaced slightly apart as shown and the track members are formed in sections 59 and 60 each section comprising a substantially U-shaped piece. Section 59 of the track extends from a point near the end wall 20 of the cabinet to the frame member 37 and has its free end portions bolted to said frame as above described. Connecting members 61 and 62 are disposed between the frames 38 and 37 and connected with them and these members are provided with elongated slots 63 in which operate bolts 64 mounting the track section 60 on the machine. Owing to this particular connection and owing to the connection between the base members it will be obvious that the track section 60 may be moved in a direction endwise of the track section 59 or toward the left as viewed in Fig. 1. The purpose of this adjustment will later be set forth.

At their opposite ends the base members 45 and 48 support bearing blocks 65 in which are mounted the lower end portions of vertical shafts 66 and 67. The upper end portions of these shafts are mounted in bearing blocks 68 and 69 the bearing block 68 being supported between angle members 70 bolted to the cross bars 41 of the frame members 34 and 35 as at 72. The bearing block 69 is supported by angle bars 73 secured to the cross bars 41 of the frame members 37 and 38. From Fig. 3 it will be seen that the angle bars 73 are provided with elongated slots 74 and that bolts 75 passing through said slots adjustably connect the angle bars to the frame member whereby the bearing 69 may be shifted outwardly to provide the adjustment above referred to.

Sprocket wheels 76 and 77 are mounted on the shafts 66 and 67 respectively and trained over these sprocket wheels is an endless chain conveyor 78. A trolley means is connected with this chain conveyor and the trolley means operates on and is guided by the tracks 56 and 57 and the trolley means serves to support the conveyor particularly when the latter is carrying a load. While a plurality of these trolley means may be employed and are shown they are identical in construction and a detailed description of one will, it is believed, suffice for all. Each trolley means comprises a pair of upright arms 79 each at its upper end equipped with a flanged roller 80 operating on the lower track 57 and guided by the upper track 56 as clearly shown in Figs. 6 and 11. A block 81 is connected with the lower end portion of each arm 79 as by a bolt 82 and the lower end portions of these blocks are connected with extensions 83 provided on certain of the links 84 of the conveyor chain. (See Figs. 6, 9 and 11.)

These extensions 83 may be received in slots in the lower edges of the blocks 81 as shown in Fig. 6 and then secured in place as by screws 85. The blocks 81 of the trolley means are connected together by links 86 and 87 the outer ends of said links being secured to the blocks as by the bolts 82 and the inner or adjacent ends of the links being arranged in overlapping re'ation and pivotally connected as by a bolt 88. Link 87 carries a lug 89 while the link 86 carries a lug 90 and these lugs cooperate to prevent pivotal movement of the links about the bolt 88 in a direction inwardly of the conveyor. However, these lugs do permit of outward movement of the links as shown in Fig. 13 and this movement is necessary to permit the trolley means to pass about the sprocket wheels. In actual use the sprocket wheels are relatively small being only of about three inches radius and consequently there is a relatively sharp turn at each sprocket wheel.

Any desired means may be provided for operating the conveyor 78 and as here shown a worm wheel 91 is mounted on the upper end portion of the shaft 66 and meshes with and is driven by a worm 92 on the same shaft with a pulley 93, driven as by a belt 94 deriving its power from any suitable source. It will be understood that that portion of the tracks over the cabinet and that portion of the conveyor likewise over the cabinet follows the slot including the arms 24 and 25. The conveyor is suspended from the track by the trolley means and the two flights or sides of the conveyor while not necessarily in exact alignment with the tracks are in substantial alignment with the slot.

The conveyor is adapted to carry into and out of the cabinet means to be cleaned by the sand blast 33. To this end one of the links 84 of the conveyor at each trolley means, or more often if desired, has secured to it a tapered socket member 95. This socket member may be welded to the link as at 96 (see Fig. 7) and the socket member is so disposed as to be slightly laterally

of the conveyor. For the purpose of connecting the socket member with the links of the conveyor the said links may be provided with downwardly extending projections 97 entering into the rear portion of the socket (see Fig. 8) and welded or otherwise secured in place. Socket 95 is tapered as shown to receive a correspondingly tapered portion of a quickly detachable supporting member as will appear.

The quick detachable supporting member employed is shown alone in Figs. 4 and 5, and this member, generally designated 98, includes a relatively fragile cast iron stem or shank 99 formed at its upper end with a tapered head or enlargement 100 adapted to be removably received in the tapered socket 95 above referred to. To remove it from the carrier or socket 95 all that is necessary is to lift the member 99 upwardly and then remove it forwardly through the open front wall or slot 95*a* of the socket 95. A new carrier may be as easily and quickly mounted in this socket by merely reversing these operations. At its lower end the shank 99 carries a series of hooks 101, the said hooks being suitably bent up from wire or the like and then disposed partly in the mold whereby when the shank 99 is cast the hooks will be secured in it by casting them in the lower head 99*a* of the bar 99. Obviously, the hooks 101 are adapted to have the articles to be cleaned attached to them and as shown in Fig. 1 the hooks of each shank 99 are carrying a gate 102 comprising a sand casting of a number of shear blades. If one of these supports should catch on anything while moving the cast iron shank 99 will merely break in two and no damage will result to any of the rest of the machine. A new carrier can be easily and quickly substituted for the broken one as described.

In its end wall 19 the cabinet 15 is provided with an entrance, and inwardly of said entrance there is arranged a partition 103 which may be of sheet metal and in this partition there is arranged a door 104 comprising a sheet of rubber provided with spaced longitudinally or vertically extending slits 105 and a series of transverse slits leading into these longitudinal slits and providing a series of flexible fingers 106 at each side of the longitudinal slits 105. This door 104 and the entrance opening in the wall 19 are disposed in alignment and are arranged below and in alignment with the slot in the wall 21 of the cabinet. A similar door or closure with these flexible resilient rubber fingers is provided in the end wall 19. It will be evident that as the carrier 98 and the article carried thereby passes through these closures the individual flexible rubber fingers can yield independently of each other and therefore as the article goes through the opening this opening conforms substantially to the outline of the article so that outward passage of sand through the opening is reduced to a minimum.

Assuming that the machine is operating and that articles as the gates 102 are to be cleaned the said articles are hooked onto the hook portions 101 of the supports 98 attached to the conveyor as above explained and the conveyor will then carry these articles through the sand blast 33. The articles will be carried through the sand blast in such a manner that first one side of the articles and then the other will be presented to be directly acted upon by the sand blast. This is accomplished since the shanks 99 of the supports 98 operate through the substantially U-shaped slot formed in the upper wall of the cabinet as above described. In Fig. 2 it will be seen that the shank of one support is in the arm 25 of the slot while the shank of a second support is in the arm 24 of the slot.

Assuming that the arrangement is such that the support enters the cabinet through the arm 25 of the slot then it will be seen that the side A of one gate 102 is being directly acted upon by the sand blast 33 while the side B of the other gate is also being directly acted upon. Since the conveyor is endless when it goes about the sprocket 76 the supports are turned about and therefore one side of a load or article to be cleaned is presented to the sand blast during movement of the support down one arm of the slot and the other side of load or article is presented during return movement of the support or during movement of the support down the other arm of the slot and on its way out of the cabinet. Therefore both sides are acted upon in the same manner by the air blast giving uniform cleaning. Guide bars 107 may be provided to prevent movement of the articles being cleaned in a direction away from the sand blast or to prevent a swinging movement of these articles under the impact of the sand blast whereby the articles traveling along one path may not become entangled with those traveling along the opposite path.

Attention is directed to the fact that sand impinging on the baffle which preferably has a rubber sheet 29 is deflected by this sheet as suggested in Fig. 2, and from this figure it will be noted that while one side of each load is being directly engaged by the sand blast the opposite side thereof is being engaged by the sand deflected by the baffle or rubber sheet. That is, the side A of the load or article carried by the support in the slot 25 is being directly engaged by the sand blast while the side B of said load is being engaged by the deflected sand. Likewise, while the side B of the load carried by the support in the slot 24 is being directly engaged by the sand blast the side A of said load is being engaged by the deflected sand. From this it will be appreciated that during its movement through a defined path in the cabinet a casting or other article carried by a support 98 will be thoroughly and uniformly cleaned as both sides are acted upon by both the direct blast and the indirect or reflected blast.

A door similar to the door 104 may be arranged in the entrance through the end wall 19 of the cabinet and it will be noted that the construction of this door is such that as different parts of the support and its load pass through the door the fingers 106 which are not directly engaged do not move out of place so that at all times there is a minimum of opening through the door whereby the escape of dust into the atmosphere about the machine is eliminated or minimized. As a further means for preventing the escape of dust from the cabinet sponge rubber strips 108 are secured to the upper surface of the top wall 21 of the cabinet in position to have their adjacent edge portions abut over the slot through which the shanks 99 of the supports travel. The free ends of these strips may normally abut as at 109 whereby the slot is sealed. As a support is carried along its shank simply presses aside the adjacent portions of the sponge rubber strips whereby the slot is opened only as the support progresses through it.

In addition to assisting in deflecting the sand as above described the rubber sheet 29 also serves to protect or preserve the sand. When a hard steel plate is substituted for this sheet the sand is dulled or loses its sharpness by contact with the

plate and thereby loses its efficiency for use in sand blast equipment. The sand does not lose its sharpness due to engagement with the rubber sheet 29. As the force of the sand is spent it descends through the cabinet preferably passing through a screen 110 and on leaving the lower open end 23 of the cabinet passes into a sand cleaning apparatus generally designated 111 and shown in Fig. 14.

However, before the sand leaves the cabinet 15 a considerable portion of the dust is removed from the sand such dust to a large extent representing material removed from the articles being cleaned. For this purpose a suitable suction apparatus including a pipe or conduit 112 is used to create a suction in the chamber 113 whereby dust will be drawn through said chamber. This chamber is, of course, formed by the plate 26 acting as a partition or dividing means and the chamber is in communication with that portion of the cabinet where the cleaning operation takes place since the chambers communicate at the lower edge of the plate 26. As above suggested the suction is set up in the chamber 113 is so regulated whereby no sand will be removed the suction being sufficient only to remove fine dust particles.

On leaving the open end 22 of the cabinet 15 the used sand passes into a receptacle 114 in which are disposed a series of baffles 115. The sand entering this receptacle 114 passes from one baffle to the next and finally through a funnel like portion 116 and a nozzle 117 is delivered to a receptacle or container 118 from which it may be taken to be again used in the sand blast apparatus. The receptacle 114 is supported as by means of uprights 119 which uprights also support a platform 120 on which is mounted a suitable suction means or fan 121 communicating with the interior of the receptacle 114 so as to remove dust, dirt or the like from the sand as it drops from one baffle to the next. This fan or exhaust means 121 may deliver into a conduit or stack 122 adapted to remove any collected or extracted dust or dirt from the vicinity of the machine.

From the foregoing description it will be seen that the present machine operates continuously and that it is therefore capable of taking care of a large amount of work. Further, it will be noted that the actual sand blast operation is enclosed whereby dust does not escape into the atmosphere about the machine and it will further be noted that the supports 98 are loaded and unloaded at one end of the machine. Therefore, one man may operate the machine doing both the loading and unloading or if the machine is being run at relatively high speed one operator may be positioned to unload the supports as they emerge from the cabinet while a second operator at the opposite side of the conveyor may load the supports.

Since each support includes a plurality of hoops 101 it will be obvious that no great care is required to attach the gates 102 or other articles to the support so as to be most effectively exposed to the sand blast and that the supports may therefore be rapidly loaded and unloaded. In the machine the articles to be cleaned do not come into contact with one another and the possibilities of the articles being broken are reduced to a minimum. Heretofore, cast shear blades have been cleaned in tumbling barrels and this operation resulted in considerable breakage. With the present machine the cleaning operation does not entail breakage. The shanks 99 of the supports being rather fragile castings as above explained are adapted to snap should any part become clogged or bound. This will result in the work and the hook portion on the particular support being dropped whereby breakage of the machine will be prevented. Should one of the supports have its shank portion 99 broken as suggested the head 100 of such support will remain in its socket 95 and may be removed therefrom when such socket emerges from the machine. To accomplish this removal it is but necessary that the operator shift said head upwardly as suggested by the broken lines in Fig. 7.

Having thus set forth the nature of my invention, what I claim is:

1. In a sand blasting machine, a cabinet, a conveyor extending above said cabinet, means for driving said conveyor, supporting means suspended from the conveyor and adapted to be carried into and out of the cabinet thereby, said supporting means adapted to have articles to be cleaned attached to it, means for directing a sand blast against articles carried by said supporting means while such articles are in the cabinet, and said conveyor arranged to carry said supporting means and article into the cabinet along one path and out of the cabinet along a substantially parallel path whereby on both its inward and outward movements the article is presented to the same sand blast.

2. In a sand blasting machine, a cabinet, an endless conveyor at the outer side of said cabinet, means for driving said conveyor, supporting means extending from the conveyor and adapted to be carried thereby into and out of the cabinet, said supporting means adapted to have articles to be cleaned attached to it whereby said articles will be carried into and out of the cabinet, means for directing a sand blast against articles carried by said supporting means while such articles are in the cabinet, and said conveyor arranged to carry said supporting means and article to be cleaned into the cabinet along one path and out of the cabinet along a substantially parallel path whereby on both its inward and outward movements the article is presented to the same sand blast.

3. In a sand blasting machine, a cabinet, said cabinet having a U-shaped slot through its upper wall, an endless conveyor extending above said cabinet, said conveyor having a loading and unloading portion beyond one end of the cabinet, said slot having its arms opening through said end of the cabinet, said cabinet having an entrance opening through said end, means for driving the conveyor, supporting means suspended from the conveyor and operating through said entrance and slot whereby it is carried into and out of the cabinet along a U-shaped path by the conveyor so that its path of outward movement is substantially parallel with its path of inward movement, said supporting means adapted to have articles to be cleaned attached to it, and means directing a sand blast from one side of the cabinet against articles carried by said supporting means while such articles are in the cabinet whereby on both its inward and outward movements the article is presented to the same sand blast.

4. In a sand blasting machine a cabinet, said cabinet having a slot through its upper wall, an endless conveyor extending above said cabinet, said conveyor having a loading and unloading portion beyond one end of the cabinet, said slot opening through said end of the cabinet, said cabinet having an entrance through said end, means for driving the conveyor, supporting

means, said supporting means comprising a relatively fragile shank portion having a tapered lug at its upper end, said conveyor having a tapered socket to removably receive said lug whereby the supporting means is suspended from the conveyor and adapted to be carried through said entrance and slot into and out of the cabinet by the conveyor, said supporting means adapted to have articles to be cleaned attached thereto, and means directing a sand blast against articles carried by said supporting means while such articles are in the cabinet.

5. In a sand blasting machine, a cabinet, a deflector plate within the cabinet, means directing a sand blast from one side of the cabinet toward said deflector plate, means for carrying an article to be cleaned into and out of the cabinet between the deflector plate and the said side of the cabinet, and said means including means whereby the article will have one side presented to the sand blast during its movement into the cabinet and its other side presented to the same sand blast during its movement out of the cabinet.

6. In a sand blasting machine, a cabinet, a deflector plate within the cabinet, means directing a sand blast from one side of the cabinet toward the inner side of said deflector plate, a sheet of rubber on the inner surface of said plate and against which the sand blast may impinge and be deflected, means for carrying an article to be cleaned into and out of the cabinet through said sand blast, and said means adapted to position said article so that one of its sides will be directly engaged by the sand blast while its other side will be engaged by sand deflected by said rubber sheet.

7. In a sand blasting machine, a cabinet, a deflector plate within the cabinet, means directing a sand blast from one side of said cabinet toward the inner side of the deflector plate, a sheet of rubber on the inner surface of the deflector plate and against which the sand blast may impinge and be deflected, means for carrying an article to be cleaned into and out of the cabinet through said sand blast, and said means including means whereby the article will first have one of its sides directly engaged by the sand blast while its other side will be simultaneously engaged by sand deflected by the rubber sheet and will then have its said other side directly engaged by the sand blast while its first side is engaged by sand deflected by the rubber sheet.

8. In a sand blasting machine, a cabinet, a deflector plate within the cabinet, means directing a sand blast from one side of the cabinet toward said deflector plate, means for carrying an article to be cleaned into and out of the cabinet between the deflector plate and the said side of the cabinet, said means including means whereby the said article will have first one side and then another presented to the said blast, and guide means within the cabinet and positioned to be engaged by the article to be cleaned to prevent movement of the article in a direction away from the sand blast.

9. In a sand blasting machine, a cabinet, track means extending above the cabinet, an endless conveyor above the cabinet and below said track means, means for driving the conveyor, trolley means on the track and connected with the conveyor to support the same, supporting means connected with the conveyor below said trolley means and adapted to be moved into and out of the cabinet by the conveyor, said supporting means adapted to have articles to be cleaned attached to it, means for directing a sand blast against articles carried by said supporting means while such articles are in the cabinet, and said conveyor carrying the articles into the cabinet along one path and out of the cabinet along a substantially parallel path whereby the articles to be cleaned are presented to the same sand blast on both their movements into and out of the cabinet.

10. In a sand blasting machine, a cabinet, an endless conveyor above said cabinet, a pair of spaced sprocket wheels over which said conveyor is trained, track means above the conveyor, trolley means on the track and connected with and supporting the conveyor, said trolley means comprising a pair of members each connected at one end with the conveyor and each at its opposite end carrying a wheel operating on the track means, a pair of links pivoted to said members and to each other, cooperating lugs on said links whereby they may move relatively in one direction only about their pivotal connection, supporting means connected with the conveyor below said trolley means and adapted to be moved into and out of the cabinet by the conveyor, said supporting means adapted to have articles to be cleaned attached to it, and means for directing a sand blast against articles carried by said supporting means while such articles are in the cabinet.

11. In a sand blasting machine, a cabinet, a conveyor extending above said cabinet, means for driving said conveyor, supporting means suspended from the conveyor and adapted to be carried into and out of the cabinet thereby, said supporting means comprising a relatively fragile shank carrying hooks at its lower end and at its upper end removably connected with the conveyor, said supporting means adapted to carry articles disposed on its hook into and out of the cabinet, said shank adapted to break and permit said hooks to drop with the articles being cleaned when such articles become caught while passing through the cabinet, and means for directing a sand blast against articles carried by said supporting means while such articles are in the cabinet.

12. In a sand blasting machine, a cabinet, an endless chain conveyor above said cabinet, a pair of spaced sprocket wheels over which said conveyer is trained, track means above the conveyor, said track means comprising a pair of sections, a frame means supporting each of said sections, each of said frame means mounting one of said sprocket wheels, trolley means on the track and connected with and supporting the conveyor, supporting means connected with the conveyor and adapted to be moved into and out of the cabinet thereby, said supporting means adapted to have articles to be cleaned attached to it, means for directing a sand blast against articles carried by the supporting means while such articles are in the cabinet, and means adjustably connecting said track sections whereby one track section and its sprocket wheel may be adjusted in a direction away from the other thereof to tension the conveyor.

13. In a sand blasting machine, a cabinet, means directing a sand blast across the cabinet from one side thereof, and means for carrying an article to be cleaned into and through the sand blast with one side exposed thereto and for then reversing the article and carrying it back through the same sand blast with the opposite side of the article exposed to the blast.

14. In a sand blasting machine, a cabinet, means directing a sand blast across the cabinet

from one side thereof, means for carrying an article to be cleaned into and out of the cabinet through said sand blast, and said means carrying the article into the cabinet along one path and out of the cabinet along a substantially parallel path whereby the article to be cleaned is presented to the same sand blast on both its movements into and out of the cabinet.

15. In a sand blasting machine, a cabinet, means projecting a sand blast across the cabinet from one side thereof, continuously moving means outside of and associated with said cabinet, supporting means moved by said continuously moving means and including portions adapted to be moved into and out of the cabinet, said supporting means adapted to have an article to be cleaned removably attached thereto whereby such article will be carried into and out of the cabinet through said sand blast, and said continuously moving means arranged to carry said supporting means and article into the cabinet along one path with one side of the article presented to the sand blast and out of the cabinet along a substantially parallel path with the other side of the article presented to the same sand blast.

16. In a sand blasting machine, a cabinet, means for directing a sand blast across the cabinet, means for carrying an article to be cleaned into and out of the cabinet through said said blast, said means carrying the article into the cabinet along one path and out of the cabinet along a substantially parallel path whereby the article to be cleaned is presented to the same sand blast on both its movements into and out of the cabinet, and said article carrying means including means whereby the article will have one side presented to the sand blast during movement of the article into the cabinet and its other side presented to the sand blast during movement out of the cabinet.

17. In a sand blasting machine, a cabinet, a conveyor extending above said cabinet, means for driving the conveyor, supporting means suspended from the conveyor and adapted to be carried into and out of the cabinet thereby, said supporting means adapted to have an article to be cleaned attached to it, means for directing a sand blast against an article carried by said supporting means while such article is in the cabinet, said conveyor arranged to carry said supporting means and article into the cabinet along one path and out of the cabinet along a substantially parallel path whereby on both its inward and outward movements the article is presented to the same sand blast, and said conveyor including means whereby the article has one side presented to the sand blast on inward movement of the article and another side presented to the sand blast on outward movement of the article.

PERCIVAL H. BEST.