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R. H. MOORE

SAND BLAST APPARATUS AND PROCESS

Filed May 20, 1922

2 Sheets-Sheet 1

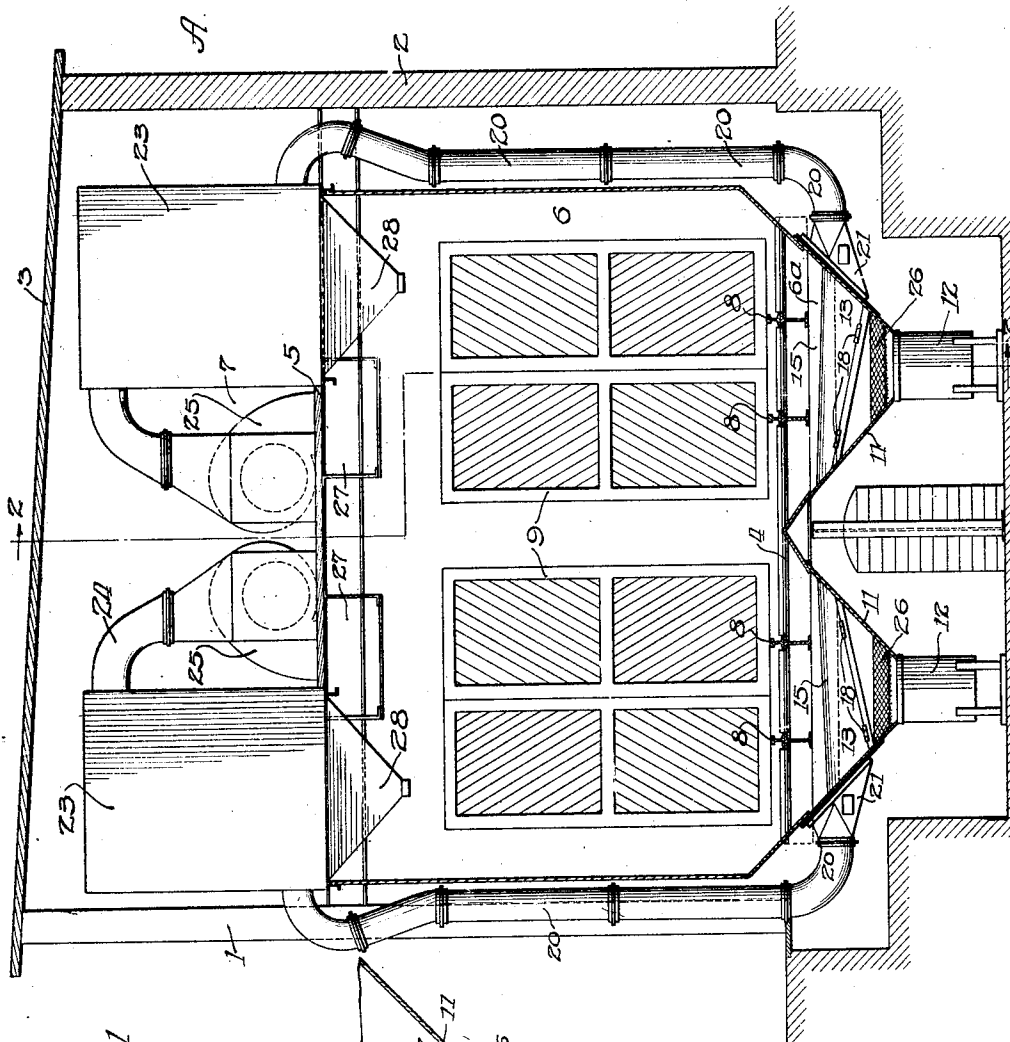


Fig. 1

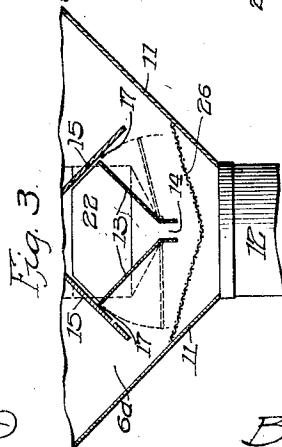


Fig. 3

Witness

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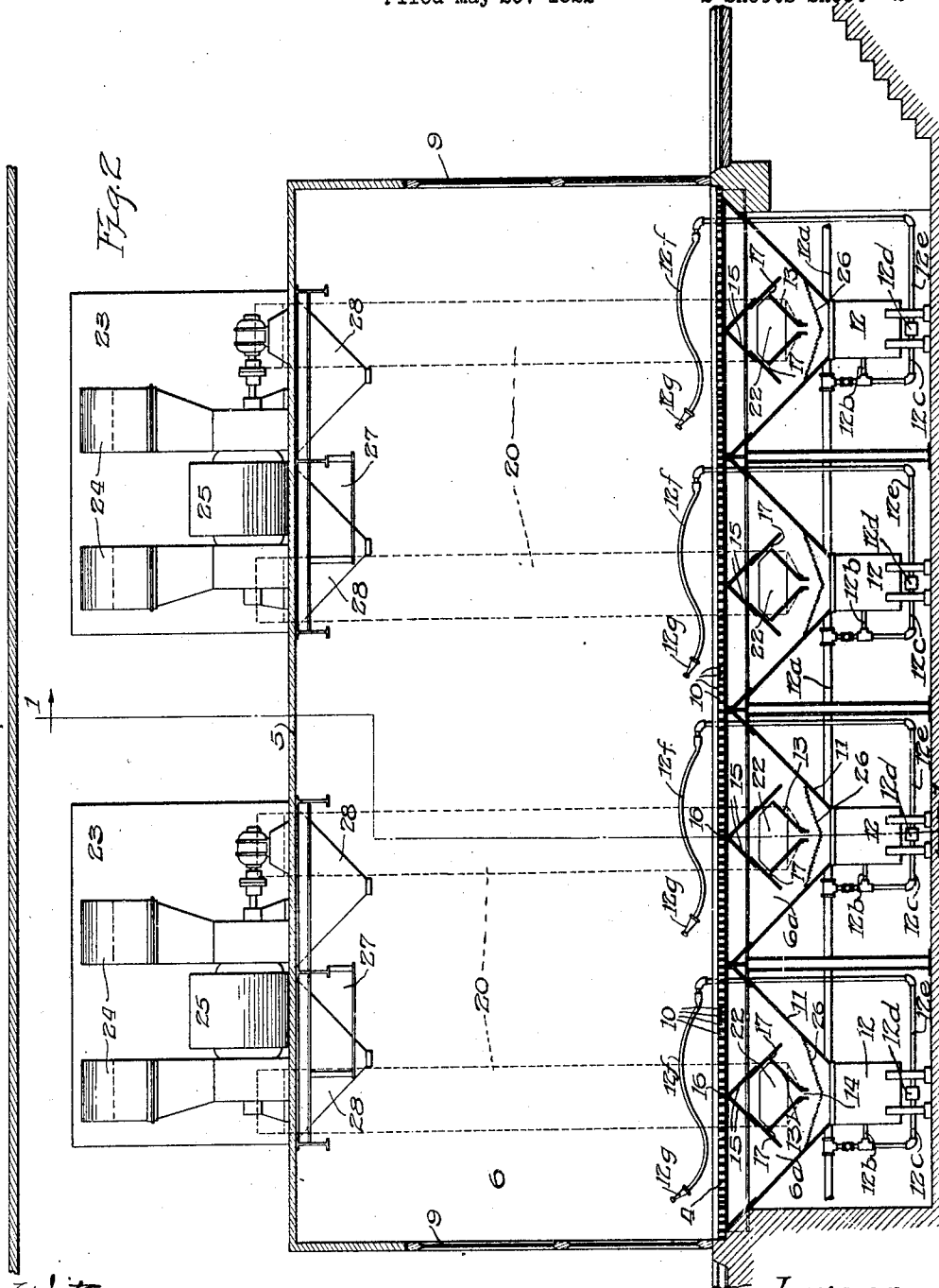
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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SAND-BLAST APPARATUS AND PROCESS.

Application filed May 20, 1922. Serial No. 562,469

My invention relates to sand blast apparatus and process, and particularly to the removal of the sand or other abrasive together with the "dust" from the sand blasting room or chamber, by "dust" being meant the pulverized abrasive, the scale cleaned from the castings or other articles, and other refuse material.

One of the objects of the invention is to provide a simple, practical, and effective sand blast apparatus and process.

Another object of the invention is to improve and simplify the method of and apparatus for separating the abrasive and dust from one another.

Another object of the invention is to obviate the necessity of lifting the abrasive in the separating process and thereby reduce the amount of power required.

Another object of the invention is to arrange for the discharge of the reclaimed abrasive directly into the sand blast machines for further use.

Another object of the invention is to improve and simplify the method of and apparatus for withdrawing and discharging the dust.

Another object of the invention is to arrange for the discharge of the air withdrawn with the abrasive and dust back into the sand blasting room or chamber, so that a complete circulation of air will be brought about.

In the accompanying drawings Fig. 1 is a cross sectional view of a sand blasting apparatus embodying and adapted to carry on process of my present invention, said figure being taken on line 1—1 in Fig. 2;

Fig. 2 is a cross section taken on line 2—2 in Fig. 1;

Fig. 3 is an enlarged section of a detail of construction.

Referring to the drawings, I show a chamber or building A, having side walls 1 and 2, a roof 3, a lower floor 4, and an upper floor 5. A sand blast room 6 is provided in this house or chamber and an upper room or chamber 7 preferably for the exhaust or suction apparatus which will be referred to more fully hereinafter. Within the room 6 the article or articles to be cleaned by the sand blast are placed. For example, such articles may be mounted on tracks 8—8 on lower floor 4, either by mounting them directly on said tracks 8—8 or upon cars or trucks which are in turn mounted on said track. Doors 9—9 are pref-

erably arranged at the ends of the house or building A, to permit insertion and introduction of the articles or cars carrying the same into blasting room 6 and the withdrawal of the same therefrom.

The floor 4 is perforated as by providing it with apertures 10—10 (Fig. 2), so that the abrasive and the dust from the blasting chamber 6 may fall through said floor 4. Below the floor 4 is a separating chamber 6^a which receives the falling abrasive and dust. In this chamber, or rather in the plurality of such chambers, the abrasive is separated from the dust so that the former may be used again and the dust discharged.

The separating chambers 6^a are conveniently formed by a series of hoppers 11—11 with downwardly inclined or sloping walls converging toward one another. At the bottoms of these hoppers are sand blast machines 12—12 located to receive sand from the hoppers 11—11. Troughs 13 are arranged within the hoppers 11—11, extending crosswise of the same from side to side thereof, as shown in Fig. 1. Each trough 13 has downwardly sloping and converging walls which extend toward one another, but do not meet, being terminated so as to form a longitudinal slot 14 along the bottom of each trough. Above each trough 13 is a hood or housing 15, having downwardly extending sloping and diverging sides which meet at 16 immediately below floor 4. The sides of this hood or housing 15 preferably project beyond the walls of trough 13 and are separated therefrom by small longitudinal spaces or side openings 17. The side walls of trough 13 are preferably hinged as at 18 so as to permit trough walls to be adjusted by swinging them upwardly or downwardly.

Suction pipes 20 are arranged at the sides of housing A and extend to hoppers 11, being secured thereto by suitable couplings or connections 21, having suction openings or mouths 22 affording communication between the interiors of pipes 20 and the interiors of troughs 13. Said pipes 20 extend upwardly to dust collectors 23 mounted on upper floor 5, said dust collectors being connected by pipes 24 with blowers 25 which produce a suction air current in dust collectors 23 and consequently in pipes 20. Thus the operation of exhaust devices 25 creates suction in dust collectors 23 and pipes 20, thereby creating suction in troughs 13 which withdraws

the dust from the abrasive as the mixture falls from the floor 4. The suction pressure is such as to withdraw the dust only, the dust being light and the abrasive being heavy, the suction not being sufficient to withdraw the abrasive also but some abrasive bounces into troughs or ducts 13 through side openings 17, 17 or rebounding from the sides of the hopper, most of the abrasive however will fall in chambers 6^a while the dust will pass out through suction mouths 22 and into pipes 20 and dust collectors 23. The abrasive bounced into troughs or ducts 13 through side openings 17, passes out through bottom slot 14, and this with the other abrasive will fall into sand blast machines 12, first passing through wire screens 26 in the lower portions of hoppers 11, which screens 26 collect the nails and other heavy foreign articles. The dust will pass through dust arresters 23 and exhaust devices 25 and into dust receptacles 27 whence it will be removed and discharged. The air withdrawn through pipes 20 will pass through dust arrester 23 and into hoppers 28 at the bottom of the same, and whence it will be again discharged into the blasting rooms or chambers 6, a complete circulation of air thus being established.

The sand blast machines 12 are machines of any suitable type adapted or capable of producing a sand blast for sand blasting castings or other articles. As such machines are well known in the art, and as various types or kinds could be used in my apparatus, no detailed description of any such will be made herein. The members 12 simply represent a typical sand blast machine now well known in the art to which is extended an air pipe 12^a having branches 12^b and 12^c running to a carbureting device 12^d below the machine 12 by means of which the abrasive and air are mixed and from which they are discharged into blast pipe 12^e. The latter extends up and through the floor 4 and is connected with a sand blast hose 12^f provided with a sand blast nozzle 12^g. Thus the sand or other abrasive falling from the sand blasting chamber 6 is cleansed by the removal of dust, dirt, grit and the like, and is carried down directly to sand blasting machines whence it is immediately put into service again by discharging it through sand blast nozzles.

It will be seen that it is not necessary to lift the sand or abrasive at all, and therefore the power which would be necessary for that purpose it is not necessary to employ.

It will be understood that changes and modifications may be made without departing from the spirit of the invention.

What I claim is:

1. The combination of a separating chamber into which the abrasive and dust may pass and pneumatic means for separating the abrasive and dust from one another in said chamber, said separating chamber compris-

ing a hopper for receiving the abrasive and dust and having a trough within the hopper, said trough being connected with said pneumatic means there being side openings to permit the entry of the abrasive and dust into said trough, and also a bottom opening to permit abrasive to fall from the trough while the dust is being removed therefrom by the pneumatic means.

2. The combination of a separating chamber into which the abrasive and dust may pass and pneumatic means for separating the sand and dust from one another in said chamber, said separating chamber comprising a hopper for receiving the abrasive and dust and having a trough within the hopper, said trough being connected with said pneumatic means there being side openings to permit the entry of abrasive and dust into said trough, and also a bottom opening to permit abrasive to fall from the trough while the dust is being removed therefrom by the pneumatic means, and means below said bottom opening in said trough for separating foreign articles from the abrasive.

3. The combination of a separating chamber into which the abrasive and dust may pass and pneumatic means for separating the abrasive and dust from one another in said chamber, said separating chamber comprising a hopper for receiving the abrasive and dust and having a trough within the hopper, said trough being connected with said pneumatic means there being side openings to permit the entry of abrasive and dust into said trough, and also a bottom opening to permit abrasive to fall from the trough while the dust is being removed therefrom by the pneumatic means, and means below said bottom opening in said trough for separating foreign articles from the abrasive and a sand blasting machine below said last mentioned separating means.

4. The combination of a sand blasting chamber, a separating chamber below said sand blasting chamber, means between said sand blasting chamber, means between said chambers for permitting the abrasive and dust to fall from the sand blasting chamber to the separating chamber, said separating chamber comprising a hopper with downwardly inclined and converging walls and a transversely extending trough arranged in said hopper, said trough having a cover provided with downwardly and outwardly diverging sides and the trough having a bottom portion with downwardly and inwardly converging sides, there being spaces between the cover and the upper wall portions of the trough and also a space or slot at the bottom of and between downwardly converging sides of the trough, a wire screen below said trough to receive abrasive from the slot in the bottom thereof, a sand blast machine below said wire screen, pneumatic pipes connected to the hopper at the ends

of said trough, exhaust apparatus connected with said pipes to draw dust from the trough and a dust separator between each pipe and the corresponding exhaust apparatus.

5 5. The combination of a sand blasting chamber, a separating chamber below said sand blasting chamber, means between said chambers for permitting the abrasive and dust to fall from the sand blasting cham-
10 ber to the separating chamber, said separating chamber comprising a hopper with downwardly inclined and converging walls and a transversely extending trough arranged in said hopper, said trough having a cover pro-
15 vided with downwardly and outwardly diverging sides and the trough having a bottom portion with downwardly and inwardly converging sides, there being spaces between the cover and the upper wall portions
20 of the trough and also a space or slot at the bottom of and between downwardly converging sides of the trough, a wire screen at the bottom of said hopper, a sand blasting machine below said wire screen, pneumatic
25 pipes connected to the hopper at the ends of said trough, exhaust apparatus connected with said pipes to draw dust from the trough and a dust separator between each pipe and the corresponding exhaust apparatus, said
30 exhaust apparatus and dust separator being above said sand blasting chamber, and the exhaust apparatus being provided with discharge openings for discharg-

ing the air back to the sand blast member.

6. The combination of a sand blasting 35 chamber, a separating chamber below said sand blasting chamber, means between said chambers for permitting the abrasive and dust to fall from the sand blasting chamber to the separating chamber, said separating 40 chamber comprising a hopper with downwardly inclined and converging walls, and a transversely extending trough arranged in said hopper, said trough having a cover provided with downwardly and outwardly 45 diverging sides and the trough having a bottom portion with downwardly and inwardly converging sides, there being spaces between the cover and the upper edges of the trough sides and also a space or slot at 50 the bottom of and between the downwardly converging sides thereof, a wire screen at the bottom of the hopper, a sand blast machine below said wire screen, pneumatic pipes 55 connected to the hopper at the ends of said trough, exhaust apparatus connected with said pipes to draw dust from the trough and a dust separator between each pipe and the corresponding exhaust apparatus, the sides of said trough being adjustable to permit 60 adjustment of the pneumatic velocity through the aforesaid spaces between the trough and cover of the trough.

In witness whereof, I hereunto subscribe my name this 12th day of May, A. D., 1922.

RAYMOND H. MOORE.