Aug. 7, 1962 G. W. McKULLA, JR 3,047,986

ABRASIVE BLASTING APPARATUS

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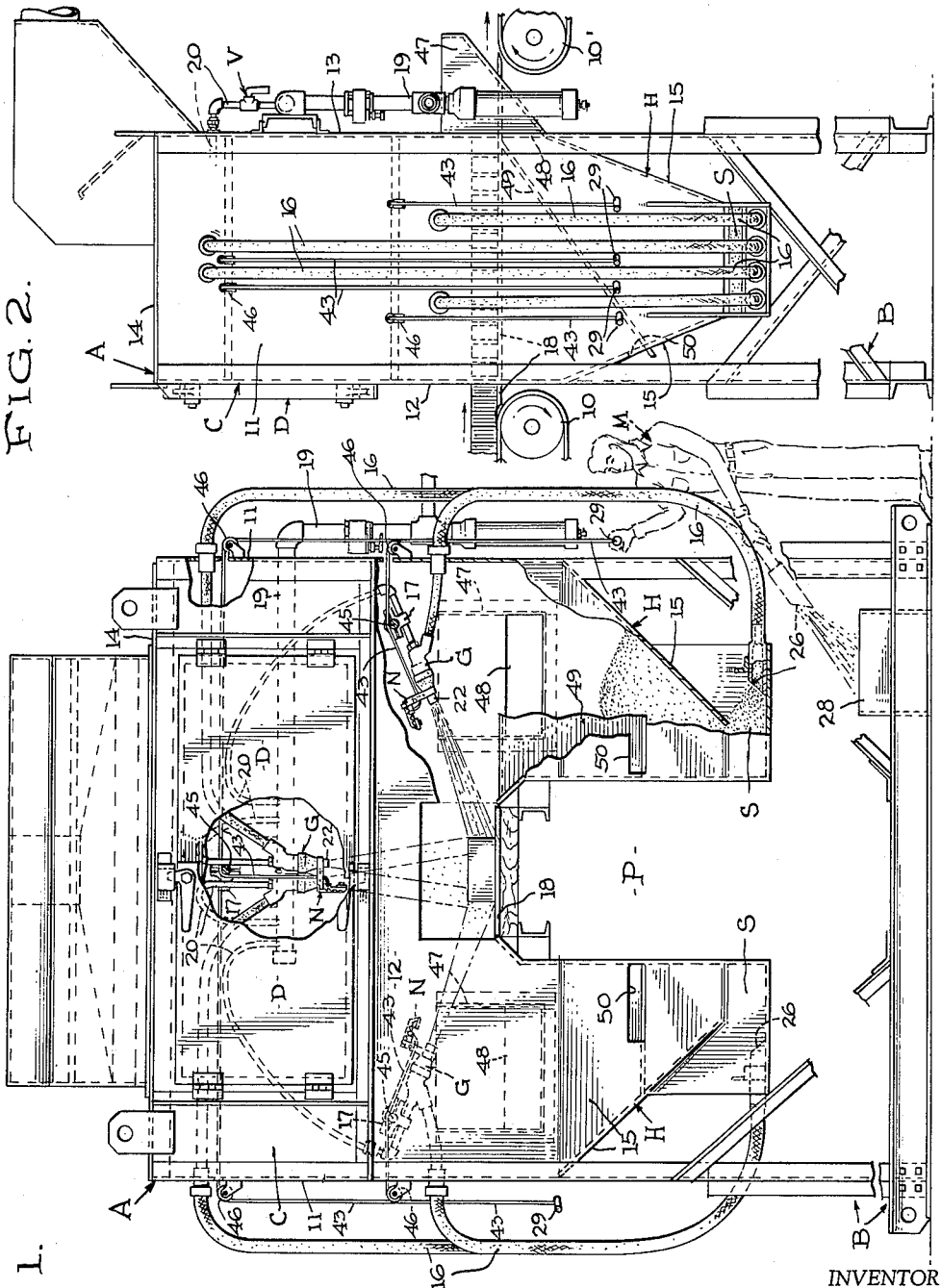


FIG. 2.

FIG. 1.

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FIG. 3.

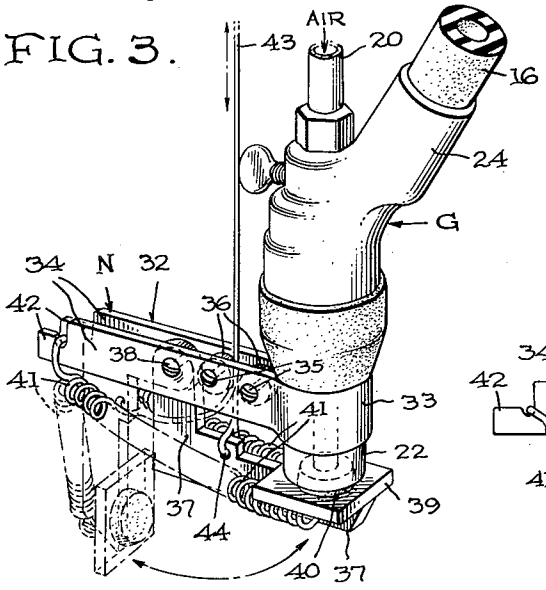


FIG. 5.

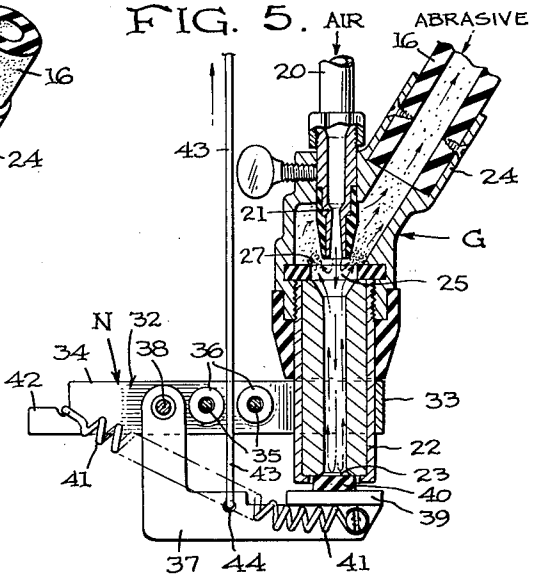


FIG. 4.

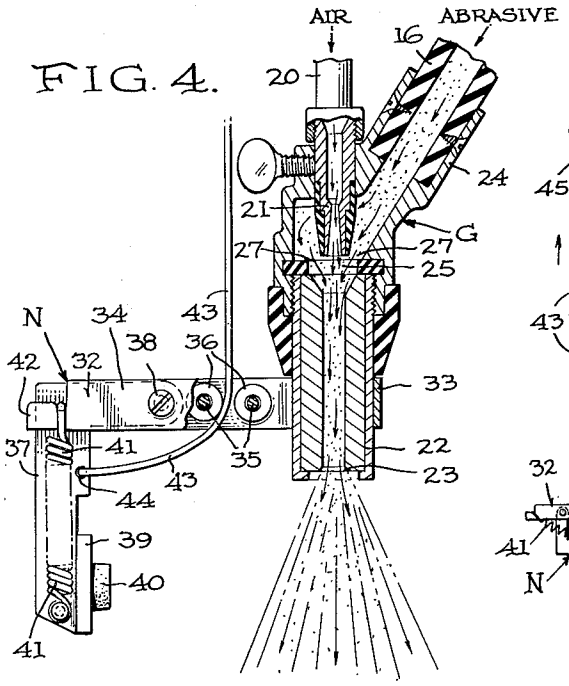
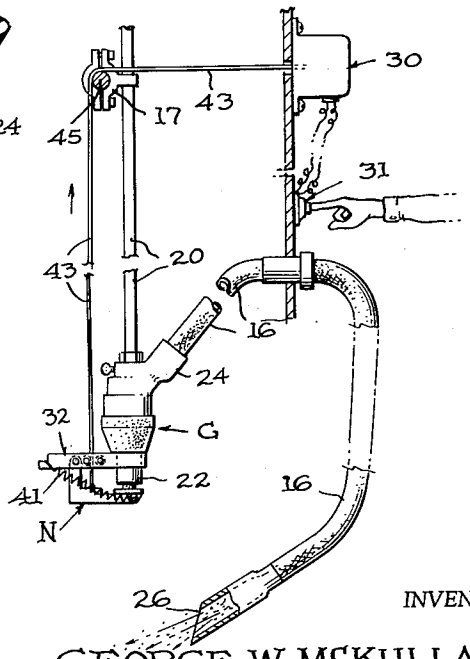


FIG. 6.



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ABRASIVE BLASTING APPARATUS

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15 Claims. (Cl. 51—8)

The present invention relates to abrasive blasting apparatus, and more particularly to means for instantly and effectively relieving or clearing the blast nozzles of such apparatus when they become plugged or clogged during use.

More specifically, the invention is directed to the provision of a novel device for clearing plugged or clogged sand blasting nozzles as used in the brick-making art for applying a decorative finish to one or more faces of bricks while in the uncured condition.

The sand blasting nozzles of brick facing machines often become clogged with agglomerated masses of sand and/or impurities such as brick cuttings which find their way into the sand supply. Another practice in the brick-making art which contributes to frequent clogging of sand blasting nozzles is that of intermixing colored pigments with the sand for the purpose of producing bricks having sand finishes of various color tones. Because the granules of sand tend to adhere and stick to the particles of pigment and then to each other, even when being subjected to the aspirating action of a high pressure air jet, the nozzles of sand blasting guns using sand-pigment mixtures become jammed or plugged at rather frequent intervals.

In the past, whenever nozzle clogging has occurred, it has been necessary to shut down the entire brick-making production line while identifying the particular nozzle which is obstructed and then either manually disassembling and cleaning the nozzle, or manually covering the discharge orifice of the nozzle with a suitable plate or a workman's glove while another workman directs high pressure air into the gun to back-blow the clogging mass through the sand feed line. These known procedures involve both lost production time and additional labor, and are therefore quite costly when computed over an extended period of time.

The principal object of the present invention is to provide new and improved means for clearing obstructions from the nozzles of abrasive blasting guns which are operable by a single workman without the necessity of stopping production or dismantling the equipment, and which thereby overcome the deficiencies and disadvantages of the practices of the prior art.

Another primary object of this invention is to provide a structurally simple, highly effective device for cleaning out plugged or clogged sand blast nozzles which is adapted for direct and permanent attachment to the nozzle itself, but is operable from a position remote from the nozzle.

A further object is to provide a novel device for clearing plugged sand blast nozzles which is of inexpensive, durable construction embodying a minimum of parts, and is effective and reliable in operation.

Still another object is to provide a device of the character described which comprises a member supported on the nozzle of an abrasive blasting gun which is movable into and out of the path of the air-borne abrasive stream issuing from the nozzle and is operable to close the nozzle discharge orifice so as to effect back-blowing of the high pressure air and thereby dislodge from the interior of the gun whatever obstruction may exist therein.

These and other objects and advantages of the invention will become more apparent from the following detailed description of the embodiments illustrated in the accompanying drawings, wherein:

FIG. 1 is a front elevation view of a typical abrasive blasting installation adapted for the sand facing of bricks or the like which incorporates one embodiment of the present invention, certain portions of the sanding cabinet being broken away to more clearly disclose the abrasive guns and the associated nozzle clearing mechanism;

FIG. 2 is a side elevation of the installation shown in FIG. 1;

FIG. 3 is an enlarged perspective view of one of the abrasive guns and associated nozzle clearing means shown in FIG. 1;

FIG. 4 is a vertical cross-sectional view of the assembly of FIG. 3, showing the nozzle clearing means in its normally retracted or inoperative position;

FIG. 5 is a cross-sectional view similar to that of FIG. 4, but showing the nozzle clearing mechanism in its operative position; and

FIG. 6 is a fragmentary diagrammatic view of a modified form of nozzle clearing mechanism adapted for electrical actuation.

Referring first to FIGS. 1 and 2 of the drawings, there is shown generally at A an apparatus for providing a decorative sand finish on one or more faces of bricks or similar articles which comprises a framework B for supporting an elevated cabinet or casing C wherein are housed a plurality of abrasive or sand blasting guns G and associated nozzle clearing mechanisms N. As illustrated by the representation of a workman M depicted in broken outline in FIG. 1, the apparatus A is relatively large in size and is interposed between two elevated conveyors 10 and 10', the conveyor 10 serving to deliver uncured bricks from the usual extruder and automatic cutting machine (not shown) to the sanding cabinet C, while conveyor 10', which is driven at a faster speed than conveyor 10, carries the sanded brick column away from the cabinet past an inspection station to a point at which the bricks are loaded onto pallets prior to delivery to the curing or burning kilns. If desired, the conveyor 10 may be extended so as to pass through the cabinet C and deliver the bricks directly to conveyor 10'.

The sanding cabinet C is generally rectangular in form and comprises side walls 11, front and rear walls 12 and 13, respectively, and a top wall 14. The bottom of the cabinet is formed by the sloping walls 15 of a pair of truncated sand hoppers H which are separated as shown in FIG. 1 by a central passageway P and deliver sand by gravity into a pair of supply hoppers S which are open at the sides to receive the suction or intake ends of a plurality of flexible abrasive-resistant conduits or hoses 16 through which sand is fed to the guns G. The cabinet C is also provided with a pair of normally closed access doors D which permit access to the guns G and their adjustable mounting means 17 within the cabinet.

In order to produce a decorative sanded finish on bricks, blasts of sand are discharged from the guns G against the top and/or side faces of the soft uncured bricks as they enter the cabinet C through an opening in the front wall 12 and are pushed through the cabinet along a delivery plate 18 which closes the upper end of passageway P and bridges the gap between conveyors 10 and 10'. The sanding is achieved in the usual manner by aspirating the sand from the supply hoppers S through hoses 16 into the guns G by the injector action of a fluid under pressure. In the apparatus illustrated, compressed air is supplied from a main header 19 through a plurality of individually valve-controlled conduits 20 of reduced cross-section to the guns G. As shown in FIGS. 4 and 5, each gun G includes a venturi type air jet nozzle 21 which is removably mounted in the gun body in axial alignment with a detachable blast nozzle 22 having a dis-

charge orifice 23, and to which one of the air delivery conduits 20 is connected. The air issuing from jet nozzle 21 and flowing outwardly through blast nozzle 22 normally causes sand to be drawn through hose 16, which is connected to an angularly offset portion 24 of the gun body, into the area 25 where the sand and air are mixed to form a high velocity air-borne stream of abrasive material. To facilitate the continuous gravity feed of sand from hoppers S into hoses 16, the suction ends 26 of the latter may be beveled, as indicated in FIG. 1.

For the purpose of further enhancing the decorative finish of the bricks, the supply of sand in the hoppers H and S is frequently mixed with various colored pigments to produce a variety of color-toned sanded bricks. As a result of this practice, the gun nozzles 22 become clogged at unduly frequent intervals at their inlet ends because the pigment particles tend to cause the sand granules to stick together and to build up obstructions, particularly in the restricted passageways 27 around jet nozzles 21 leading to the mixing areas or chambers 25. Clogging also occurs due to the presence in the sand of brick cuttings and other foreign matter, or when the sand is wet. Heretofore, when such clogging occurred it was necessary for a workman to climb up on the cabinet C, open the double access doors D, identify the clogged gun nozzle, and then, after stopping the entire assembly line and shutting off the air to all guns, either unscrew the nozzle and clean out the obstruction, or manually place a plate or heavy pad tightly over the discharge orifice 23 while having another workman open the air line to the clogged gun after removing the suction end 26 of the associated feed hose 16 from the supply hopper S and directing it toward a refuse collecting receptacle 28, as indicated in FIG. 1. By the latter procedure, the air flows back from the closed end of the nozzle, through the mixing chamber 25 and passageway 27, and out the feed hose 16, carrying with it whatever sand, pigment or foreign matter may have caused the obstruction.

As previously stated, the nozzle clearing mechanism N forming the subject matter of the present invention overcomes the disadvantages of the time-consuming and costly procedures of the prior art in a simple, efficient and inexpensive manner, and may be operated from floor level exteriorly of the cabinet C, either by hand-pull means 29 as shown in FIGS. 1 and 2, or by electrical solenoid means 30 and push buttons 31 as depicted in FIG. 6.

The details of the mechanism N are best seen in FIGS. 3, 4 and 5. As there shown, each gun G is provided with a supporting bracket or frame 32 which is rigidly mounted on and secured to the nozzle 22, one practical form of said bracket being generally U-shaped as shown, fabricated of a durable strap material, and having a neck 33 which is clamped around nozzle 22 and a pair of parallel arms 34 which are joined together in spaced relationship by screws or bolts 35 surrounded by spacer sleeves 36. The arms 34 project substantially at right angles from the axis of the gun nozzle 22, and support a selectively movable L-shaped lever 37 for pivotal movement about a pivot pin 38 which passes through lever 37 at a point adjacent the end of the shorter arm thereof. Lever 37 carries at the end of its longer arm a plate 39 to which is fixed a plug 40 of abrasive-resistant rubber or other resilient material adapted to close and seal the orifice 23 of nozzle 22 when the lever 37 is moved into the position shown in FIG. 5. In order to normally maintain the nozzle closing assembly comprising lever 37, plate 39 and plug 40 out of the path of the air-borne stream of sand which issues from nozzle 22 and thereby avoid abrasive damage to said assembly a pair of tension springs 41 are suitably connected between the outer ends 42 of bracket arms 34 and the outer free end of the lever 37 beneath plate 39, the direction of pull of springs 41 relative to pivot pin 38 being such as to yieldably urge lever 37 into the position shown in FIG. 4.

Means are also provided for selectively moving each lever 37 and the associated plate 39 and plug 40 into the nozzle closing position illustrated in FIG. 5 whenever it is desired to clear the gun of an obstruction, which means are operable from a location remote from the gun. In the installation depicted in FIGS. 1–5, the operating means comprise a cable 43 of stainless steel or other suitable material one end of which passes between the spacer sleeves 36, the rounded surfaces of which offer a minimum of frictional resistance to movement of the cable, and is attached to the longer arm of lever 37 at a point 44 inwardly of plate 39. The rest of cable 43 is trained over a rounded rod 45 forming part of the gun mounting means 17, or over a pulley mounted on said rod, and then passes through an aperture in one of side walls 11, over another anti-friction means or pulley 46 disposed exteriorly of the cabinet C, and downwardly to a point adjacent the hopper S and reachable from the floor level, at which point the cable terminates in a toggle or other suithand-pull member 29. As will be seen from FIGS. 1 and 2, the portion of each cable 43 outside cabinet C parallels and is closely adjacent the sand feed hose 16 which leads to the same gun G as that whose nozzle clearing mechanism N is operable by said cable, and each hand-pull member 29 is so located that a workman may grasp said member and pull the cable with one hand while simultaneously withdrawing the suction end 26 of the associated hose 16 from the hopper S and directing it toward the refuse receptacle 28 with his other hand.

The modified form of the invention illustrated diagrammatically in FIG. 6 differs from that shown in FIGS. 1–5 only in that the outer end of each cable 43 is connected to the plunger of a solenoid 30 which is mounted on one of side walls 11 exteriorly of cabinet C, and a push button 31 is provided for energizing the solenoid from any suitable source of electrical power whenever it is desired to actuate the nozzle closing means to which the cable is connected. It will also be understood that the push buttons 31 are located at substantially the same positions as the toggles 29 of FIGS. 1 and 2 so that one workman can simultaneously close the blast nozzle and handle the suction end of the sand supply hose of any selected gun.

In operation, the supply hoppers S are fed from main hoppers H which are periodically filled with sand or other abrasive material, mixed with colored pigments when desired, through filling chutes 47 supported on the rear wall 13 of the cabinet C. The sand feeds by gravity from chutes 47 into hoppers H through openings 48 in wall 13 and then into the lower hoppers S into which the beveled suction ends 26 of the abrasive supply conduits or hoses 16 are removably inserted. A downwardly inclined plate 49 is mounted above each opening 48 and across the upper portion of each hopper H to prevent the spent sand and pigment particles from re-collecting in said hopper. Openings 50 are provided in the front wall 12 of the cabinet adjacent the lower ends of plates 49 through which the spent abrasive material may be periodically discharged.

The hoses 16 normally deliver sand to the guns G, four of which may be disposed in two pairs directed angularly downward and inward from opposite sides of the cabinet C toward the end faces and portions of the top faces of the bricks on the delivery plate 18, and while two additional pairs may be mounted above the bricks for downward discharge onto the top surfaces of the bricks. Compressed air is also normally delivered to each gun G through one of the valve-controlled air delivery conduits 20 connected to the main air supply header 19 which extends laterally across the rear wall 13 of the cabinet C. As the uncured bricks pass through the cabinet on the plate 18, a sand facing may be applied to one or more of the exposed faces thereof by simply opening the individual air valves V (FIG. 2) of whichever of guns G it is desired to use.

As long as all of the guns G then in use function nor-

mally by directing air-borne streams of abrasive material against the exposed faces of the bricks, the nozzle clearing mechanisms N are retained in their retracted, inoperative positions by the springs 41. However, whenever the operator observes that one of the guns ceases to deliver a proper abrasive blast due to clogging of the nozzle, he can quickly and effectively clear the obstructed nozzle, in a matter of a few seconds, by simply withdrawing the suction end 26 of the associated flexible sand conduit 16 from the hopper S and directing it toward the waste receptacle 28, while pulling down on the proper hand-pull member 29 and the cable 43 connected thereto so as to close the discharge orifice 23 of the clogged nozzle, whereupon the compressed air delivered to that gun is deflected back through the nozzle and forces the obstructing sand and other matter out of the gun through the conduit 16 and into the receptacle 28, as indicated in FIG. 1. When the nozzle has been cleared, the hand-pull member 29 is released, thereby permitting the springs 41 to return the nozzle closing lever 37, plate 39 and plug 40 to their normal retracted position, and the suction end 26 of conduit 16 is reinserted into the sand supply hopper S, whereupon sand is again fed to the associated gun.

The solenoid actuated arrangement shown in FIG. 6 operates in the same manner as above described except that the cables 43 are pulled by the solenoids 30 whenever the push button switches 31 are closed.

It will be apparent from the foregoing disclosure that the nozzle clearing mechanism of the present invention fully achieves the objects and advantages set forth in the preamble of this specification. While the specific installation described and illustrated herein is related to the brickmaking art and is intended for the purpose of providing sanded faces on bricks, it is to be expressly understood that the invention is applicable to other types of abrasive blasting apparatus, including those using abrasive materials other than sand.

It will also be obvious that the invention is not limited to the particular devices shown in the drawings, but is capable of a variety of mechanical embodiments, and that various changes, which will now suggest themselves to those skilled in the art, may be made in the form, details of construction and arrangement of the parts without departing from the inventive concept. Reference should therefore be had to the appended claims for a definition of the scope of the invention.

What is claimed is:

1. In an abrasive blasting apparatus of the type embodying a plurality of abrasive guns mounted in a normally closed cabinet for directing air-borne streams of abrasive material against exposed surfaces of articles within the cabinet which are to be abraded, each of said guns including a passageway through which abrasive particles are aspirated from a supply line by a jet of air under pressure, a chamber in which said particles are mixed with the air to form an air-borne abrasive stream, and a blast nozzle having an orifice from which the abrasive stream is discharged, and wherein the abrasive material tends to clog up and form obstructions in said passageway during operation of the apparatus; the combination with said apparatus of means for clearing said nozzles when clogged comprising a member movably mounted on each of said abrasive guns for closing the discharge orifice of the nozzle thereof, means for normally retaining each of said members out of the path of the abrasive stream issuing from said nozzle, and means operable from a position remote from said guns for selectively moving each of said members into a position wherein it closes the discharge orifice of the associated nozzle and thereby causes the air to flow back into the abrasive supply line through said passageway and clear whatever obstruction may exist therein.

2. In an abrasive blasting apparatus of the type embodying a plurality of abrasive guns mounted in a normally closed cabinet for directing air-borne streams of abrasive material against exposed surfaces of articles within the cabinet which are to be abraded, each of said guns including a passageway through which abrasive particles are aspirated from a supply line by a jet of air under pressure, a chamber in which said particles are mixed with the air to form an air-borne abrasive stream, and a blast nozzle having an orifice from which the abrasive stream is discharged, and wherein the abrasive material tends to clog up and form obstructions in said passageway during operation of the apparatus; the combination with said apparatus of means for clearing said nozzles when clogged comprising a member supported on the nozzle of each of said abrasive guns for movement toward and away from the discharge orifice of said nozzle, yieldable means for normally retaining each of said members out of the path of the abrasive stream issuing from said nozzle, and means operable from a position outside the cabinet of said apparatus for moving each of said members individually into a position wherein it closes the discharge orifice of the associated nozzle and thereby causes the air to flow back into the abrasive supply line through said passageway and clear whatever obstruction may exist therein.

3. In an abrasive blasting apparatus of the type embodying a plurality of abrasive guns mounted in a normally closed cabinet for directing air-borne streams of abrasive material against exposed surfaces of articles within the cabinet which are to be abraded, each of said guns including a passageway through which abrasive particles are aspirated from a supply line by a jet of air under pressure, a chamber in which said particles are mixed with the air to form an air-borne abrasive stream, and a blast nozzle having an orifice from which the abrasive stream is discharged, and wherein the abrasive material tends to clog up and form obstructions in said passageway during operation of the apparatus; the combination with said apparatus of means for clearing said nozzles when clogged comprising a movable member supported on the nozzle of each of said abrasive guns for closing the discharge orifice of said nozzle, spring means normally maintaining each of said members in a position wherein the discharge orifice of the associated nozzle is open, and means operatively connected to each of said members and operable from a position remote from said guns for selectively moving said member against the force of said spring means into a position wherein it closes the discharge orifice of the associated nozzle and thereby causes the air to flow back into the abrasive supply line through said passageway and clear whatever obstruction may exist therein.

4. In an abrasive blasting apparatus of the type embodying a plurality of abrasive guns mounted in a normally closed cabinet for directing air-borne streams of abrasive material against exposed surfaces of articles within the cabinet which are to be abraded, each of said guns including a passageway through which abrasive particles are aspirated from a supply line by a jet of air under pressure, a chamber in which said particles are mixed with the air to form an air-borne abrasive stream, and a blast nozzle having an orifice from which the abrasive stream is discharged, and wherein the abrasive material tends to clog up and form obstructions in said passageway during operation of the apparatus; the combination with said apparatus of means for clearing said nozzles when clogged comprising a member movably mounted on each of said abrasive guns for closing the discharge orifice of the nozzle thereof, means for normally retaining each of said members in a position wherein the discharge orifice of the associated nozzle is open, and manually actuatable means individual to each of said members for moving said member into a position wherein it closes the discharge orifice of the associated nozzle and thereby causes the air to flow back into the abrasive supply line through said passageway and clear whatever obstruction may exist therein.

5. Apparatus for sand blasting bricks comprising a

casing through which bricks are adapted to be moved, a plurality of sand blasing guns mounted in said casing for directing air-borne streams of sand against exposed surfaces of said bricks, each of said guns including a body having connections to a source of air under pressure and a supply of sand, a passageway within said body through which sand is aspirated by the air, a chamber in which the sand and air are mixed, and a nozzle through which the mixture of sand and air is discharged as a high velocity abrading stream, and means for clearing said guns of obstructions to the discharge of such abrading streams from said nozzles including a movable member carried by each of said gun bodies having a plug for closing the discharge end of the associated nozzle, means for normally maintaining each of said members and the associated plug in a position out of the path of the abrading stream issuing from the associated nozzle, and means operable from a position outside said casing for moving each of said members individually into a position wherein the plug thereof closes the discharge end of the associated nozzle and causes the air to flow backwardly through said chamber and passageway toward the sand supply, thereby clearing the gun of whatever obstruction may exist therein.

6. Apparatus for sand blasting bricks comprising a casing through which bricks are adapted to be moved, a plurality of sand blasting guns mounted in said casing for directing air-borne streams of sand against exposed surfaces of said bricks, a sand hopper, a plurality of sand conduits each having one end connected to one of said guns for supplying sand thereto and the other end removably inserted in said sand hopper, each of said guns including a body having a connection to a source of air under pressure and another connection to one of said sand conduits, a passageway within said body through which sand is aspirated by the air, a chamber in which the sand and air are mixed, and a nozzle having an orifice through which the mixture of sand and air is discharged as a high velocity abrading stream, and means for clearing said guns of obstructions to the discharge of such abrading streams from said nozzles including a movable member supported on the nozzle of each of said gun bodies for closing the discharge orifice of said nozzle, yieldable means for normally maintaining each of said members in a position wherein the discharge orifice of the associated nozzle is open, and means operable from a position adjacent said sand hopper for moving each of said members individually into a position wherein it closes the discharge orifice of the associated nozzle and causes the air to flow backwardly through said chamber, passageway and sand conduit, thereby clearing the gun of whatever obstruction may exist therein.

7. Sand blasting apparatus as claimed in claim 6 wherein said last-named means comprises a cable connected at one end to each of said members, extending therefrom to a position outside said casing and having connected to its other end means for applying a pull to said cable to move said member into the position wherein it closes the discharge orifice of the associated nozzle.

8. Sand blasting apparatus as claimed in claim 7 wherein the means for applying a pull to each cable is a manually actuatable toggle located adjacent the sand hopper.

9. Sand blasting apparatus as claimed in claim 7 wherein the means for applying a pull to each cable comprises a solenoid to which the cable is connected and a manually actuatable switch for energizing said solenoid located adjacent the sand hopper.

10. Mechanism for clearing obstructions from an abrasive blasting gun of the type including a body adapted to be connected to a source of air under pressure and to a supply of abrasive material having therewithin a passageway through which the abrasive material may be aspirated by the air and a chamber in which the air and abrasive material may be mixed, and a blast nozzle carried by said body having a discharge orifice through which the mixture of air and abrasive material may be discharged as an air-borne abrasive stream, said mechanism comprising a movable member for closing the discharge orifice of said nozzle, means for normally maintaining said member in a position adjacent said body but outside the path of the abrasive stream issuing from said orifice, and means operable from a position remote from said gun body for moving said member from its normal position into a position wherein it closes said orifice.

11. Mechanism for clearing obstructions from an abrasive blasting gun of the type including a body adapted to be connected to a source of air under pressure and to a supply of abrasive material having therewith a passageway through which the abrasive material may be aspirated by the air and a chamber in which the air and abrasive material may be mixed, and a blast nozzle carried by said body having a discharge orifice through which the mixture of air and abrasive material may be discharged as an air-borne abrasive stream, said mechanism comprising a supporting bracket adapted to be mounted on said nozzle, a member pivotally supported by said bracket having a portion thereof which is movable into and out of a position wherein it closes the discharge orifice of said nozzle, yieldable means for normally maintaining said member in a position wherein the discharge orifice of said nozzle is open, and means operable from a position remote from said gun body for moving said member from its normal position into the position wherein said orifice is closed.

12. Mechanism for clearing obstructions from an abrasive blasting gun of the type including a body adapted to be connected to a source of air under pressure and to a supply of abrasive material having therewithin a passageway through which the abrasive material may be aspirated by the air and a chamber in which the air and abrasive material may be mixed, and a blast nozzle carried by said body having a discharge orifice through which the mixture of air and abrasive material may be discharged as an air-borne abrasive stream, said mechanism comprising a supporting bracket adapted to be mounted on said nozzle and to extend at right angles to the axis thereof, a lever member pivotally supported by said bracket and carrying at one end thereof a plug for closing the discharge orifice of said nozzle, spring means connecting said bracket and said lever member and so arranged as to normally maintain said member in a position wherein the discharge orifice of the nozzle is open, and means connected to said lever member and operable from a position remote from said gun body for moving said member against the force of said spring means into a position wherein said plug closes said discharge orifice.

13. Mechanism for clearing obstructions from an abrasive blasting gun of the type including a body adapted to be connected to a source of air under pressure and to a supply of abrasive material having therewithin a passageway through which the abrasive material may be aspirated by the air and a chamber in which the air and abrasive material may be mixed, and a blast nozzle carried by said body having a discharge orifice through which the mixture of air and abrasive material may be discharged as an air-borne abrasive stream, said mechanism comprising a supporting bracket adapted to be mounted on said nozzle and to extend at right angles to the axis thereof, a substantially L-shaped lever member pivotally supported adjacent the end of one of its arms by said bracket and carrying adjacent the end of its other arm a plug of abrasive-resistant material for closing the discharge orifice of said nozzle, a tension spring so connecting said bracket and said lever member as to normally maintain said member in a position wherein the plug-carrying arm lies substantially parallel to the axis of said nozzle and outside the path of the abrasive stream issuing from said discharge orifice, and means connected to said lever member at a point intermediate its pivot point and said plug and operable from a position remote from said gun body for

moving said member against the force of said spring into a position wherein the plug-carrying arm is substantially perpendicular to the nozzle axis and said plug closes said discharge orifice.

14. Mechanism as claimed in claim 13 wherein said last-named means comprises a flexible cable connected at one end to said lever member and having connected to its other end manually actuatable means for applying a pull to said cable.

15. Mechanism as claimed in claim 14, including means carried by said bracket for guiding said cable.

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