Aug. 18, 1931. S. E. GARRATT 1,819,021

SAND BLAST MACHINE

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Fig.1.

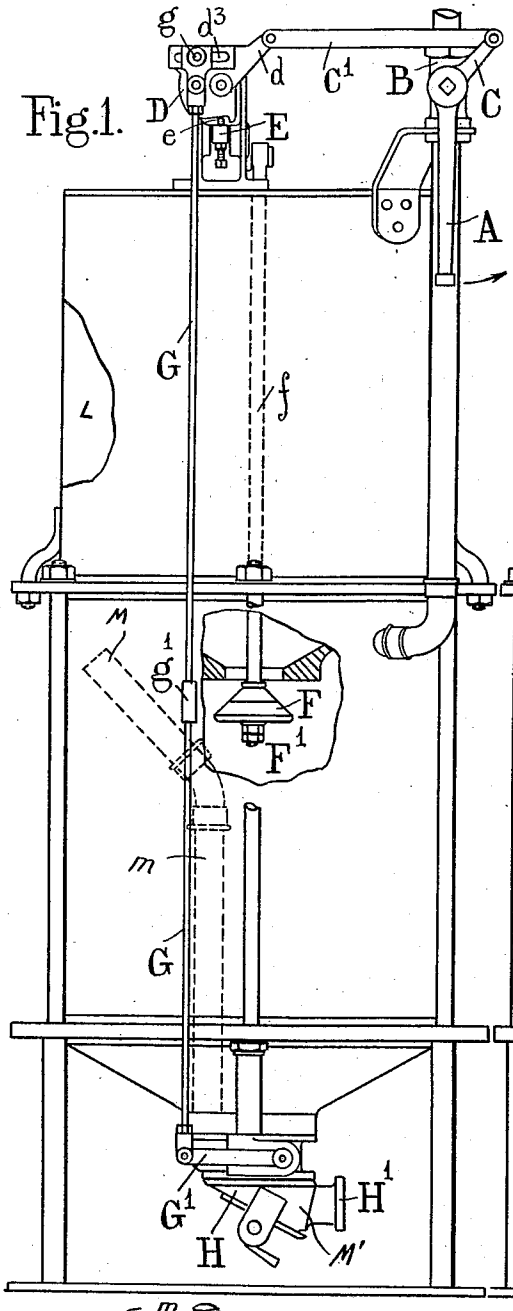


Fig.2.

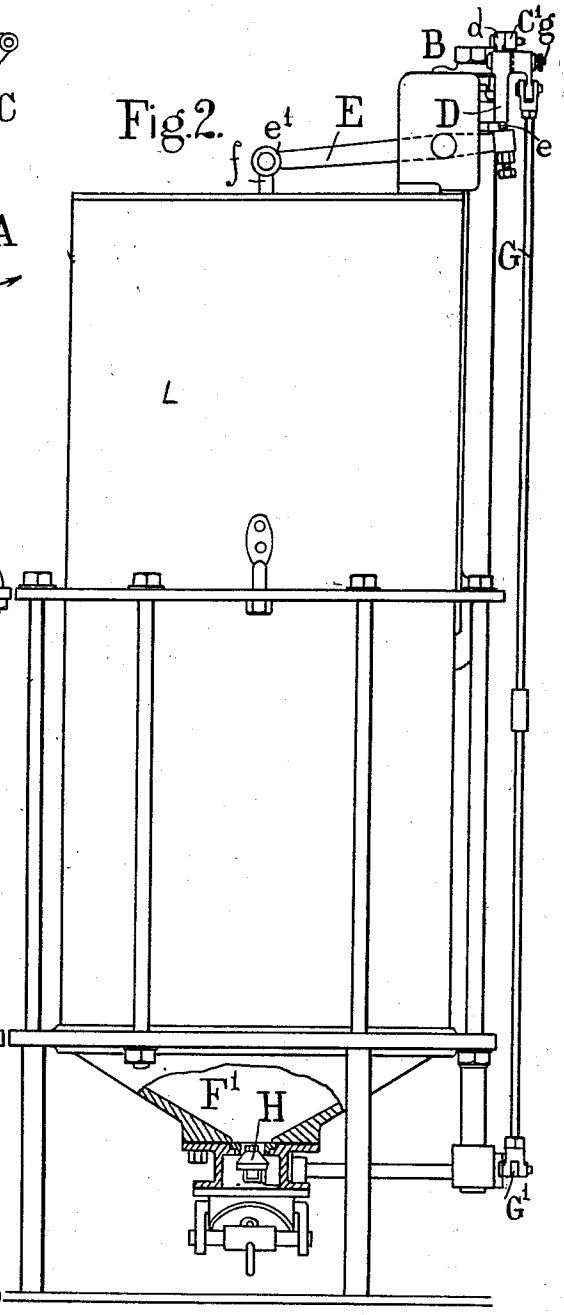
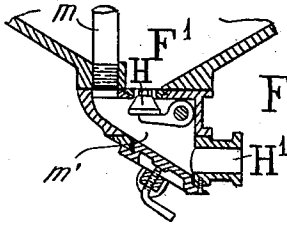


Fig.3.



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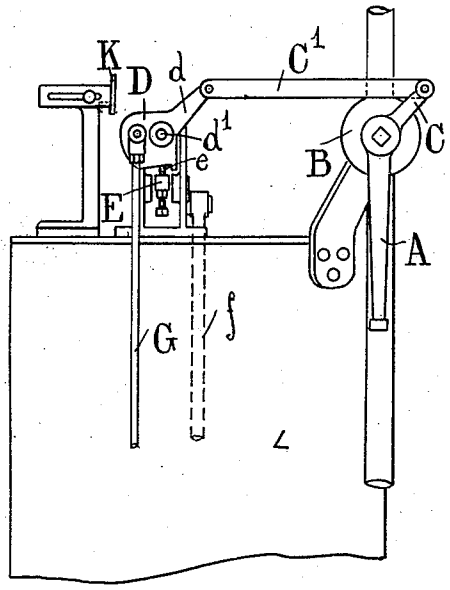


Fig.5.

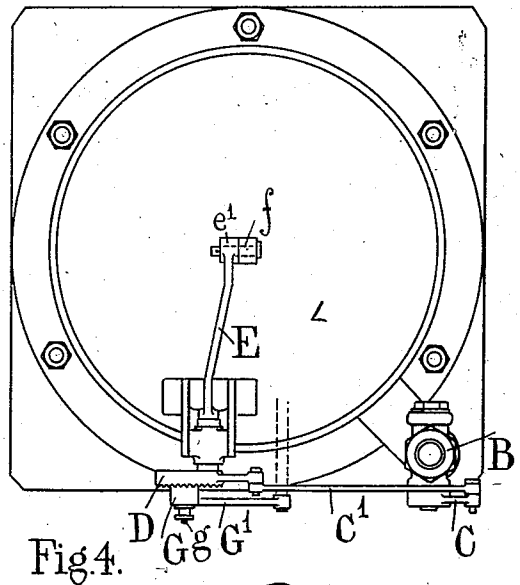


Fig.4.

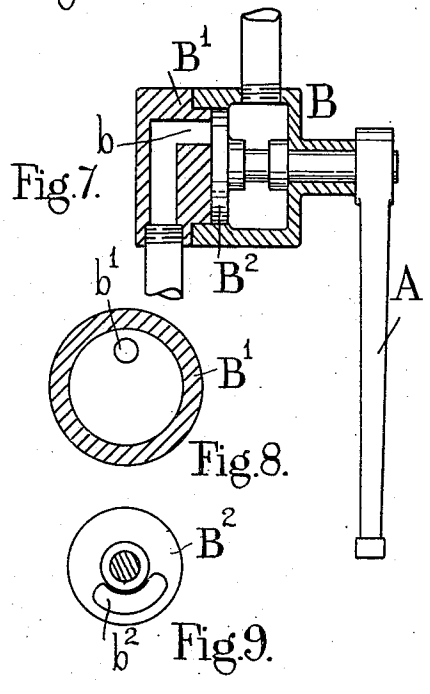


Fig.7.

Fig.8.

Fig.9.

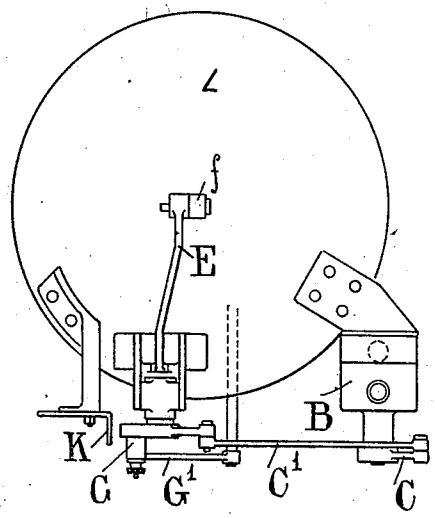


Fig.6.

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Patented Aug. 18, 1931 1,819,021

UNITED STATES PATENT OFFICE

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SAND BLAST MACHINE

Application filed October 2, 1928, Serial No. 309,804, and in Great Britain October 3, 1927.

This invention relates to improvements in sand blast apparatus and more particularly to the valve control thereof of the type in which one movement of a single lever controls the air supply valve, the filling valve and the abrasive regulating valve.

It has been found that for a given air pressure and size of nozzle that the maximum sand blasting efficiency is obtained when a given amount of abrasive is flowing and the essential feature of the present invention is to provide a positive linked mechanism whereby the opening of the abrasive regulating valve can be regulated to the position giving the greatest efficiency with the air pressure and nozzle employed.

The invention will be described with reference to the accompanying drawings:—

Fig. 1 is an outside elevation partly in section of a sand blast apparatus showing one form of the invention applied thereto.

Fig. 2 is an outside elevation partly in section of same at right angles to Fig. 1.

Fig. 3 is a section of abrasive valve H.

Fig. 4 is a plan of Fig. 1.

Fig. 5 is an outside elevation of the upper part of a sand blast apparatus showing another form of the invention applied thereto.

Fig. 6 is a plan of same.

Figs. 7, 8 and 9 are detail views of the air control valve.

Abrasive is stored in a chamber L and delivered to a pressure chamber F^1 by a valve F compressed air being also admitted to the pressure chamber through a valve B and passes from this chamber to a mixing chamber M^1 by a pipe M. The abrasive is delivered to the mixing chamber M^1 arranged below the pressure chamber F^1 by a regulating valve H.

In the arrangement shown in Figs. 1 to 4 an operating lever A is mounted on the spindle of the air control valve B. An arm or lever C is mounted on or forms part of the lever A and is connected by the link C^1 to an arm d affixed to or forming part of a cam D mounted on a fixed pivot d^1. The cam D acts on a screw e carried on one end of the pivoted lever E, the other end e^1 of which is connected to the rod f controlling the filling valve F.

The cam D is provided with a slot d^3 to receive a bolt g which can be adjusted laterally to any position in the slot. The face of the cam D adjacent to the slot d^3 is serrated so that when the position of the bolt g has been adjusted and the bolt tightened up, the serrations on the face of the cam will prevent any movement of the bolt.

The bolt g is pivotally connected to the upper end a long vertical rod G the lower end of which is pivotally connected to a lever G^1 operating the abrasive regulating valve H.

It will be evident that the position of the bolt g in the slot d^3 in the cam D will adjust the amount of opening of the regulating valve H since by moving the bolt g it will be brought nearer to or further from the pivot d^1 on which the cam oscillates and accordingly a lesser or greater movement will be imparted to the rod G on the movement of the operating handle A.

The vertical rod G is preferably made in two or more parts connected together by a screw device g^1 so that the rod G can be lengthened or shortened to compensate for the different positions of the bolt g in the slot d^3.

The operating lever A is preferably arranged so that the air valve B does not commence to open until the filling valve F through which the abrasive passes to the pressure chamber F^1 is closed.

The delivery outlet H^1 of the abrasive regulating valve H is formed separately from the valve and is capable of being affixed in any position relative thereto without altering the position of the operating gear. With such arrangement the operating gear can be placed in any convenient position without it being necessary to reduce the efficiency of the apparatus by using additional bends in the pipe line from the discharge outlet H^1.

In operation the filling valve F is closed when the air control valve B and the abrasive regulating valve H are open and the abrasive regulating valve H is adjusted by movement of the bolt g in the slot d^3 in the cam D to the position giving the greatest

efficiency for the air pressure and nozzle employed. After it has been once adjusted no further adjustment is necessary and the movement of the operating handle A will always open the valve H to the desired position.

The reverse movement of the operating lever A closes the regulating valve H and cuts off the air supply, the air remaining in the pressure chamber F^1 being sufficient to clear the pipe line of abrasive. When the pressure chamber is exhausted the filling valve F is free to open.

In the form of the invention shown in Figs. 5 to 9 the vertical rod G is pivotally mounted on the cam D but is not adjustable in relation to the fixed pivot d^1 on which the cam D oscillates and in order to adjust the regulating valve H an adjustable stop K is provided the position of which regulates the movement of the cam D and consequently the amount which the valve H will open.

The cam D is formed with an arm d connected by the link C^1 to the arm or lever C on the air regulating valve B on which is mounted the operating lever A.

As in this arrangement the angular movement of the operating lever A varies for different positions of the regulating valve H it is necessary to construct the air valve B so that it will be full open to the air pressure whether the angular movement of the lever is small or large. The valve B is therefore constructed with a stationary base B^1 having an orifice b^1 therein and a disc B^2 rotated by the lever A having a slot b^2 therein concentric with the periphery of the disc B^2. Thus once the slot b^2 has uncovered the aperture b^1 the aperture b^1 will remain uncovered during any further movement of the lever A whether such movement of the lever A be large or small according to the position of the adjustable stop K.

The only difference between the operation of the device shown in Figs. 1 to 4 and that shown in Figs. 5 to 9 is that instead of adjusting the bolt g^1 in the slot d^3 in the cam D in the former, the movement of the cam D is regulated by the stop K in the latter.

What I claim as my invention and desire to protect by Letters Patent is:—

Sand blast apparatus comprising the combination with an abrasive storage chamber and a pressure chamber, a filling valve for delivering abrasive from the storage chamber to the pressure chamber, a valve for admitting compressed air to the pressure chamber, a mixing chamber below the pressure chamber, an outlet valve for the abrasive from the pressure chamber into the mixing chamber and an outlet pipe for the compressed air from the top of the pressure chamber to the mixing chamber of a single operating lever mounted on the air control valve, a cam mounted on a fixed pivot which controls the filling valve and to which the operating lever is connected and a vertical rod for controlling the abrasive regulating valve adjustably mounted on the cam so that its distance from the pivot thereof can be regulated.

In testimony whereof I have hereunto set my hand this 21st day of September, 1928.

STEPHEN ERNEST GARRATT.