Sept. 14, 1926. 1,599,817

H. F. HOEVEL

DEVICE FOR REMOVING OBSTRUCTIONS FROM SAND BLAST APPARATUS

Filed Dec. 24, 1921

Fig. 1.

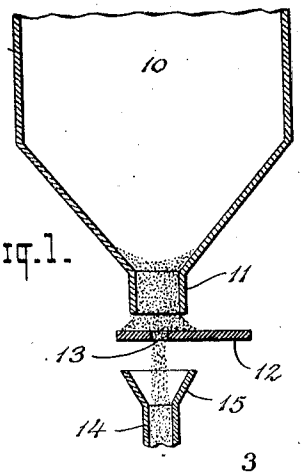


Fig. 2.

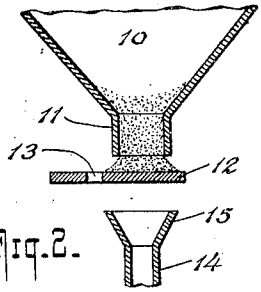


Fig. 3.

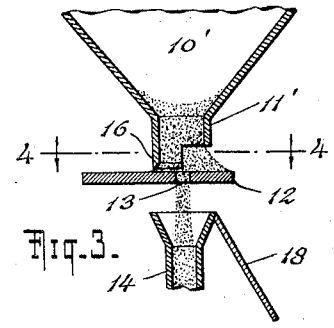


Fig. 4.

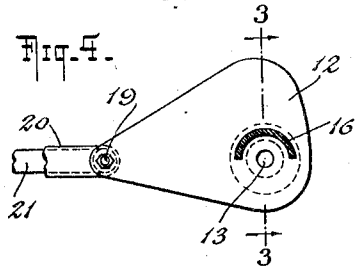


Fig. 5.

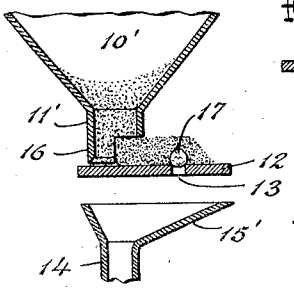


Fig. 6.

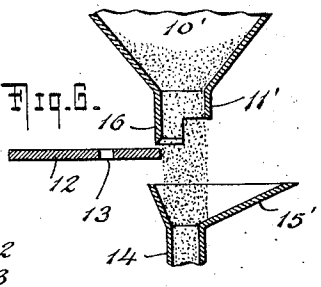


Fig. 7.

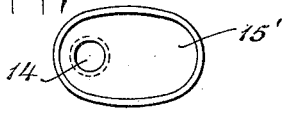


Fig. 8.

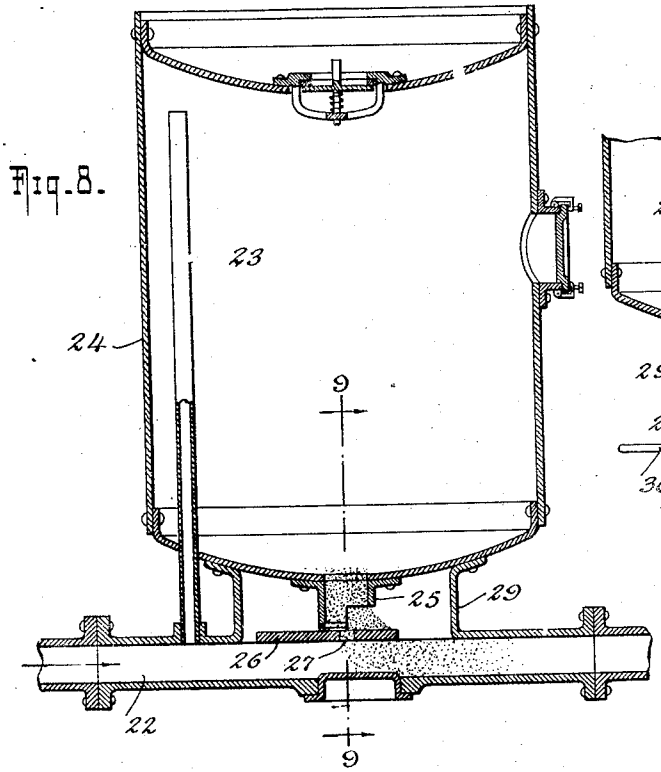
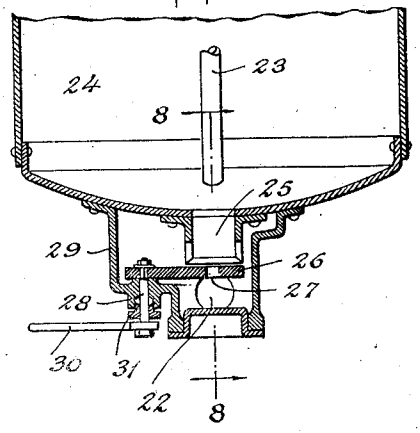


Fig. 9.



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UNITED STATES PATENT OFFICE.

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DEVICE FOR REMOVING OBSTRUCTIONS FROM SAND-BLAST APPARATUS.

Application filed December 24, 1921. Serial No. 524,625.

My present invention relates to apparatus for treating articles with a blast of sand or other hard material, and more particularly to improvements in the storage and feeding tanks commonly used in connection with such apparatus, and from which the sand or other agent is fed to nozzles or like discharge devices.

In tanks of this character it occurs frequently that the passage of the valve or slide controlling the outlet becomes clogged by core nails, pieces of wood or iron or other foreign bodies which happen to be in the sand. In order to remove such obstructions, which interfere with the proper feeding of the sand, it often becomes necessary to open the hand hole in the storage tank and remove all the sand through such hole.

It is the purpose of the present invention to avoid this drawback so that clogging cannot readily occur, and that when it occurs, the obstruction can easily be removed from the outside of the tank without requiring the removal of the contents of the tank. The objects and advantages of my invention will appear fully from the description following hereinafter and the novelty will be pointed out in the appended claims.

In the accompanying drawings I have illustrated four preferred and satisfactory examples of my invention, but I desire it to be understood that I do not wish to limit myself to the exact details shown. In these drawings,

Fig. 1 is a vertical section through one form of a device embodying my invention; Fig. 2 is a similar view, but showing a certain valve in a different position; Fig. 3 is a vertical section through another form of my invention, taken on line 3—3 of Fig. 4, which is a horizontal section on line 4—4 of Fig. 3; Fig. 5 is a vertical section through still another form of my invention, Fig. 6 is a view similar to Fig. 5, but showing the slide valve in a different position; Fig. 7 is a top view of a funnel shown in Figs. 5 and 6; and Figs. 8 and 9 illustrate my invention as applied to a sand-blast pressure tank, Fig. 8 being a section on line 8—8 of Fig. 9, and Fig. 9 a fragmentary section on line 9—9 of Fig. 8.

The form of my invention illustrated by Figs. 1 and 2 comprises a sand-storage tank or hopper 10 provided at its lower end with a relatively large spout 11 through which the sand may flow, say by gravity. Underneath the outlet of said spout 11, and at a short distance therefrom, is arranged a regulating valve or slide 12 mounted so as to be movable across said outlet. This valve is provided with a passage or opening 13 which is much smaller than the outlet of the spout 11 and which in one position of the slide, registers with said outlet, see Fig. 1. Underneath the valve 12 is located a pipe 14 having a funnel-shaped upper end 15 in alignment with the opening 11 in the storage tank. The receiving opening of said funnel 15 is larger than the valve passage 13, and preferably at least as large as the outlet of the spout 11. The opening 13 is of such a size that when it is in alignment with the spout 11 (Fig. 1) it allows the particular amount of sand required for the operation of the sand-blast apparatus to pass through the valve 12 into the pipe 14 from where the sand is fed to the place of use, say to a nozzle (not shown), in any suitable manner.

When it is desired to shut off the supply of sand from the pipe 14, the valve 12 is moved so as to bring the opening 13 to a position of the character shown in Fig. 2. That is, the opening 13 is brought not only out of registry with the spout 11, but is moved over so far that, allowing for the angle of repose of the sand as indicated in Fig. 2, no sand will reach said opening in this position. The sand will then continue to flow out of the tank for a moment, until a certain amount has accumulated on the solid or imperforate portion of the valve when further movement of the sand will be stopped automatically, it being understood that the said imperforate portion of the slide is large enough to allow the sand resting on the slide to assume its angle of repose, without dropping off (at right-hand edge, Fig. 2).

The advantages of providing the tank 10 with a relatively large outlet and of locating the valve 12 at a distance from said outlet, will be apparent: any foreign bodies contained in the sand which are too large to pass through the valve opening 13 will not clog the outlet on the inside of the tank, but will pass out, either partly or entirely, through said outlet and come to rest on the valve 12, from where they may readily be removed, say by hand, whereupon the operation may be continued after only a short interruption. The space between the outlet of the spout 11, and the valve 12, is sufficient to allow the attendant to introduce a stick

or rod, or even his hand, for removing any obstructions resting on the valve.

In Figs. 3 to 9, I have illustrated forms of my invention in which the clogging object may be swept off or removed automatically by a sweeping-off device when the valve 12 is moved. As shown, the spout 11′ of the tank 10′ is provided at its lower portion with a downwardly-extending projection or wall 16, which in the particular example illustrated is half-round with its center of curvature coinciding with the axis of the spout 11′. The wall 16 ends close to the valve 12, but preferably not in contact therewith, and is so located that the valve in its movement from the "closed" position (Fig. 5) to the "open" or from the sand-arresting to the sand-feeding position (Fig. 3) moves across the outlet of the spout 11′ in a direction toward said wall 16.

It will be seen that by moving the valve 12 toward the opening or sand-feeding position (Fig. 3) any clogging articles which may have become lodged on the valve will be removed from their clogging position, or swept off, so to speak, by the relative movement of the valve 12 and the wall 16. This will be clear from Figs. 3 and 5. The latter figure illustrates how the sand (with an obstruction 17 closing the opening 13) is taken along by the movement of the valve 12 toward the right (that is, from the position shown in Fig. 3 to that shown in Fig. 5). It will be evident that by the next movement of the valve 12 toward the left (Fig. 5), the sand containing the obstruction 17 will be swept over the right-hand edge of the valve 12. If one movement of the valve is not enough to sweep the obstruction away, the valve may be moved back and forth repeatedly. The sand thus swept off may fall on a chute 18 (Fig. 3) which may lead it to a waste bin or the like (not shown), or it may fall direct into the pipe 14, the pipe being in this case formed with an oblong, funnel-shaped mouth 15′ (Figs. 5, 6 and 7). In the latter case the obstruction will, in many cases, pass through the nozzle of the apparatus, but should it stick in the nozzle, the obstruction can be removed therefrom by unscrewing the nozzle, which is a much simpler operation than opening the sand-tank.

In Fig. 4 I have illustrated, as an example, one way of operating the valve 12. As shown, the valve is pivoted at 19 on a stationary support 20 the pivot pin being connected rigidly both with the valve 12 and with an arm or handle 21 by means of which the valve may be swung from one position to the other.

In some cases it may be desirable to swing the valve 12 entirely free of the outlet 11, so that the sand (and any obstruction contained therein) may drop freely from the outlet 11 into the pipe 14. This third position of the valve 12 has been shown in Fig. 6, the other two positions being illustrated by Figs. 3 and 5. Of course, the valve might be moved to this extreme position (Fig. 6) in connection with other forms of my invention, for instance the species illustrated by Figs. 1 and 2.

Figs. 8 and 9 illustrate my invention as applied to a sand-blast pressure tank, in which the sand and air are mixed under the full pressure given to the air by a compressor. Air under pressure is admitted to pipe 22 from which a branch pipe 23 leads into the sand tank 24 and ends at a point above the level of the sand. At the bottom of the tank is a spout 25 provided with a sweeping off device such as shown in Figs. 3, 5 and 6 and underneath the spout is arranged a valve 26 having an opening 27. This valve is pivoted at 28 within a casing 29 secured to the tank and by means of which the pipe 22 is supported on the tank 24. The interior of the casing 29 is closed to the surrounding air but communicates with the pipe 22 by an opening in the top of the pipe and also communicates with the spout 25. 30 is a handle or lever by means of which the valve may be operated from the outside, a packing box 31 insuring a tight joint where the pivot pin 28 passes through the casing.

It will be understood that devices constructed according to this invention will be applicable not only to the feeding of sand, but of other materials such as for instance grit or steel shot.

I claim:

1. The combination of a spout having a downwardly discharging end with a projection extending downwardly at one side of such end so as to leave an opening at the other side and a valve movable across said end and in advance thereof, to cause material resting on the valve to be swept off through said opening by the movement of the valve.

2. The combination of a spout having a downwardly discharging end with a projection extending downwardly at one side of such end so as to leave an opening at the other side, a valve movable across said end and in advance thereof, to cause material resting on the valve to be swept off through said opening by the movement of the valve, said valve having an opening smaller than said first-named opening, and a common receiving device for receiving the material passing through said openings.

In testimony whereof I have signed this specification.

HERMAN F. HOEVEL.