W. LINTERN.

SANDING DEVICE,

APPLICATION FILED APR. 3, 1919.

1,352,205.

Patented Sept. 7, 1920.

2 SHEETS—SHEET 1.

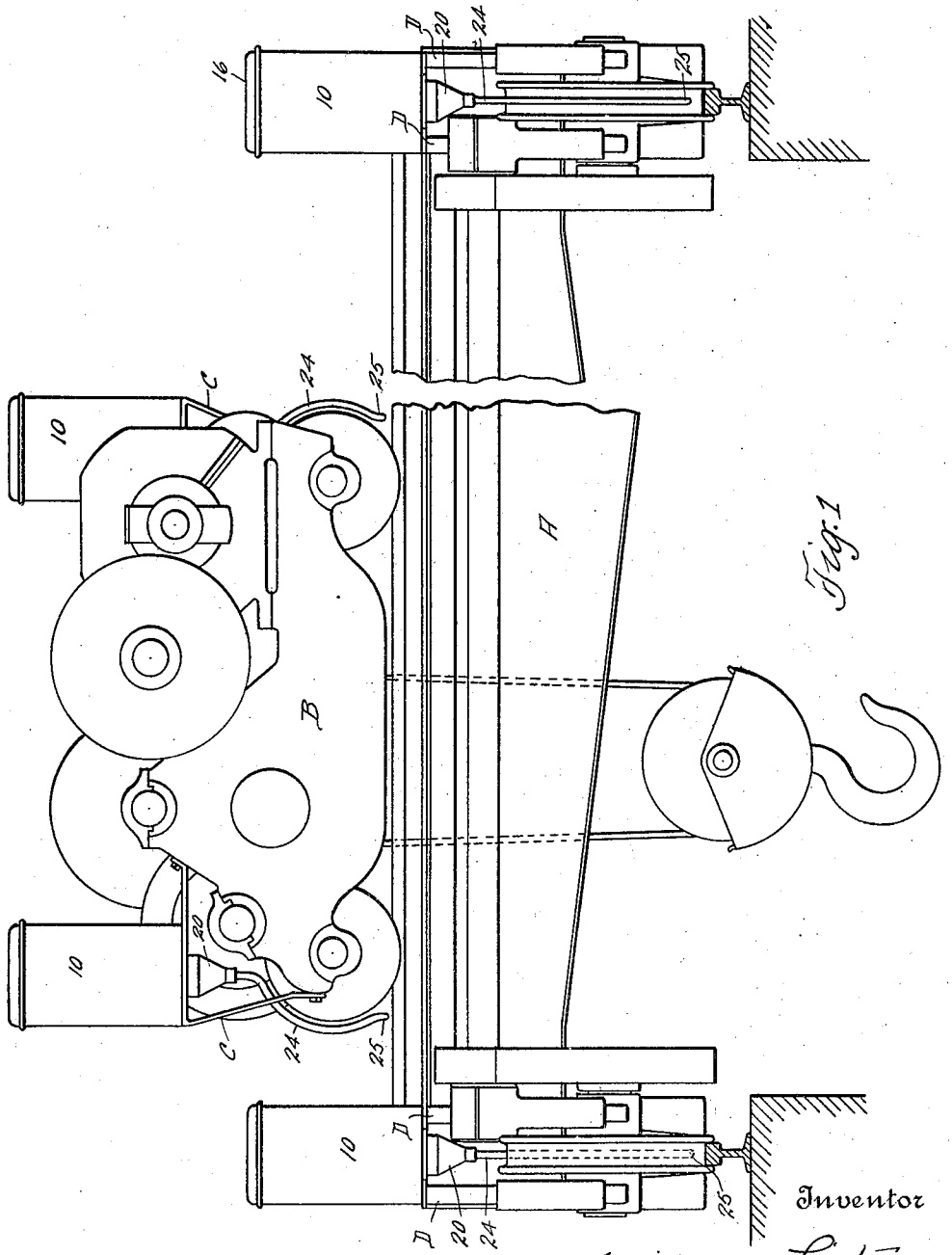


Fig. 1

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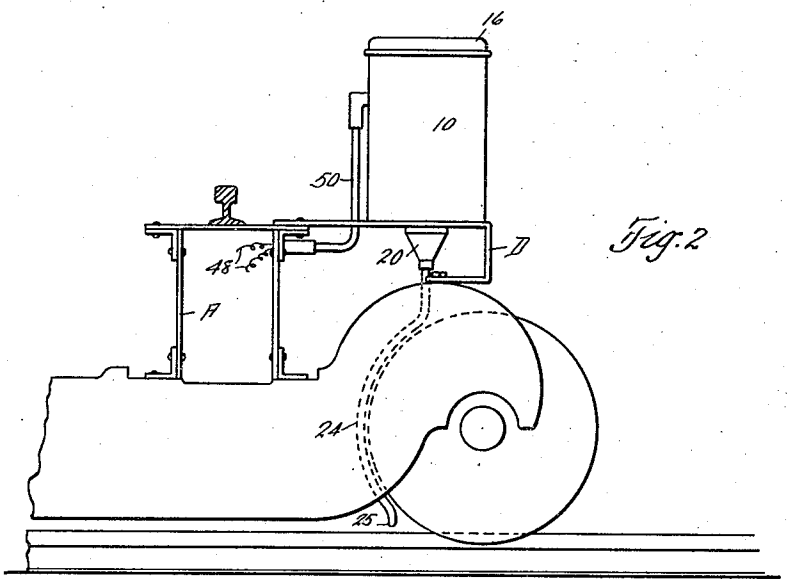


Fig. 2

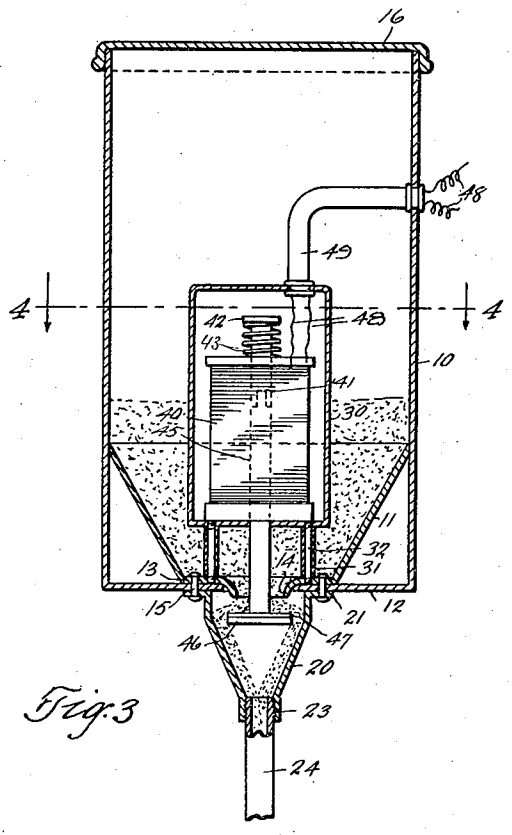


Fig. 3

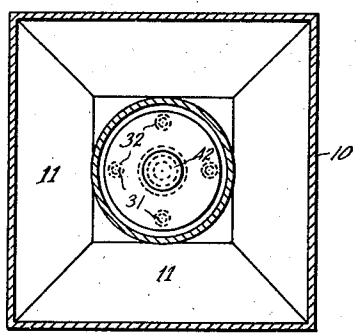


Fig. 4

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UNITED STATES PATENT OFFICE.

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SANDING DEVICE.

1,352,205. Specification of Letters Patent. Patented Sept. 7, 1920.

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To all whom it may concern:

Be it known that I, WILLIAM LINTERN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Sanding Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a simple, efficient and readily operable sanding device designed to release sand so that it may pass onto a trackway to enable a device rolling thereon to obtain proper traction. My sander is designed to be electrically operated and to release sand at the bottom of a receptacle, allowing the desired quantity of it to descend by gravity. The sander has various adaptations. I have found it particularly useful for embodiment on traveling cranes for sanding the track on which either the bridge member or trolley runs. This sanding device results in immediate application of sand to the track, insuring a good traction notwithstanding grease, snow or ice on the track, and thus increases the efficiency and safety of the crane operation.

My sander is shown in the drawings hereof embodied both on the bridge member and trolley of a traveling crane, and is hereinafter more fully described, and its essential characteristics are summarized in the claims.

In the drawings, Figure 1 is a side elevation partly broken away of a traveling crane, wherein four of my sanding devices are provided for sanding the two rails on which the bridge member travels and the two rails on the bridge member on which the trolley travels; Fig. 2 is a fragmentary end elevation of Fig. 1, showing the outside of the sanding device at right angles to Fig. 1; Fig. 3 is a vertical section through the sanding device on an enlarged scale; Fig. 4 is a cross section on the line 4—4 of Fig. 3.

Referring more particularly to Figs. 3 and 4, the sand container of my device consists of an upright tank 10, preferably rectangular in cross section, having near its bottom inclined partitions 11 to make a hopper. The tank preferably has its own supporting bottom 12 independent of the hopper walls. Secured to this bottom at the base of the hopper is a plate 13, having a central orifice, being preferably round, and the plate being curled down at the edge of the orifice, as shown at 14 in Fig. 3. This plate is preferably secured to the base 12 of the receptacle by rivets 15. The outer edge of the plate 13 forms an abutment for the hopper plates 11.

20 indicates a discharge conduit for the sander. This is preferably a round tubular member having at its upper edge an outward flange 21 by which it is secured to the bottom of the receptacle and below this contracting conically and having at its lower end an internally threaded portion 23 into which the discharge pipe 24 screws. I have shown the same rivets 15 securing the discharge member and the plate 13 to the bottom 12.

Within the sand receptacle is a closed housing 30 preferably made of sheet metal and supported a short distance above the base of the receptacle by suitable legs. The legs shown consist of tubes 31 between the plate 13 and the bottom of the housing and screw threaded bolts 32 occupying these tubes and screwing into the plate and bottom of the housing. Within the housing 30 is a solenoid 40 standing vertically and supported by the base of the housing. Within the upper portion of this solenoid is an iron core 41 which extends above the solenoid and terminates in a head 42. A compression spring 43 surrounds the core between the head and the top of the solenoid and tends to raise the core. At its lower end the core is connected with a non-magnetic extension bar 45 or brass or other suitable material, which passes downwardly through the bottom of the solenoid through an opening in the bottom of the housing and centrally through the orifice 14. Below the orifice the bar 45 carries a head 46, above which is a suitable gasket or washer 47. 48 indicate the conductors leading to the solenoid. These are shown as occupying a suitable elbow tube 49 extending from the side wall of the sand receptacle to the top of the housing 30.

In the operation of my device the spring 43 normally keeps the core 41 and its extension drawn up to the uppermost position with the washer 47 in tight engagement with the lower edge of the curled down portion 14 of the plate 13, this lower edge thus constituting a valve seat for the valve carried by the solenoid. The spring therefore normally maintains the apparatus closed. To dis-

charge the sand current is supplied to the solenoid through the conductors 48. When energized the solenoid draws down the core 41 which lowers the head 46 and washer 47, opening the discharge at the orifice 14, as shown in Fig. 3. Sand then passes by gravity through the orifice and around the outer edge of the washer and head and downwardly through the discharge pipe 24. The flow of sand continues as long as the current is maintained in the solenoid and stops as soon as the current ceases.

It will be seen that the sanding device is simple in construction, positive in action, normally prevents any leakage of sand, and at the same time is instantly operable by a switch located at any convenient point to effect the track sanding.

The means of supporting the sand receptacle will of course vary according to the adaptation made of it, but it is very readily supported by straps extending beneath the receptacle outside of the discharge conduit 20. Fig. 1 shows at C such straps secured to the trolley B for supporting the sanders 10. Fig. 2 shows at D somewhat differently bent straps for supporting the sanders on the bridge member A. In each case the discharge pipe 24 is preferably curved to pass downwardly adjacent to the periphery of the wheel and terminate a short distance above the rail, as shown at 25 in Figs. 1 and 2. Fig. 2 shows a suitable pipe 50 outside of the tank 10 through which the wires 48 are led into the tank. Each of the tanks 10 preferably has a suitable cover at its upper end indicated at 16. The removal of this cover allows a quantity of sand to be placed in the receptacle, which may entirely inclose the solenoid and its wires, protected by the housing 30 and pipe 49. Thus the tank may carry sufficient sand to last for a long time.

I have found that when traveling cranes are equipped with these sanding devices the mere running of the bridge member and trolley over their tracks once with the sander solenoids energized will properly sand the track sufficiently to last for a comparatively long service. The sander is instantly available for an emergency stop, though, for the greatest efficiency of operation, the track should be maintained sanded by regular periodic applications.

Having thus described my invention, what I claim is:

1. In a sanding device, the combination of a receptacle having a discharge orifice, a valve below the orifice and movable downwardly to open the same, a housing within the receptacle, a member extending from within the housing to the valve for operating it, and electromagnetic means within the housing for operating said member.

2. The combination of a receptacle having a discharge orifice, a housing within said receptacle supported above said orifice, a solenoid within said housing, a rod extended through the solenoid and projecting downwardly through the orifice, and a valve head carried by the rod below the orifice and movable with the rod in a direction perpendicular to the plane of the orifice to coact therewith.

3. The combination of a sand receptacle having a funnel portion with a discharge orifice, a valve below the orifice and adapted to close the same, a rod for operating the valve, a solenoid, and a core for the solenoid connected with the rod, and a housing for the solenoid located in the receptacle and supported by legs allowing access of sand to the orifice.

4. The combination of a receptacle for sand provided with a discharge orifice, a valve for closing said orifice, a rod for operating said valve, an iron core connected with said rod, a solenoid into which the rod and core extend, said core projecting above said solenoid, a head thereon, means whereby the solenoid may cause the valve to open, and a spring between said head and solenoid acting on the rod and core and tending to close the valve.

5. The combination of a receptacle having a discharge orifice in its bottom, a valve head below the orifice and adapted to seat against a valve seat around the orifice when drawn upwardly, a rod attached to the head and extending through the orifice for operating the valve head, a solenoid into which said rod extends, a solenoid core connected to the upper end of the rod and positioned above the center of the solenoid, said core having an extension projecting out of the top of the solenoid provided with a head, and a compression spring surrounding such core extension and compressed between the head thereon and the top of the solenoid.

6. The combination of a receptacle having a discharge orifice in its base, a discharge conduit below the base surrounding said orifice, a rod extending downwardly within the receptacle through the orifice, a valve head on the rod below the orifice and having its periphery some distance inside the wall of the conduit, a housing supported within the receptacle some distance above the orifice, a vertical solenoid in said housing, said rod extending through the base of the housing into the solenoid, and a core within the solenoid connected with said rod.

7. The combination of a receptacle having a discharge orifice in its base, a discharge conduit below the base surrounding said orifice, a rod extending downwardly within the receptacle through the orifice, a valve head on the rod below the orifice and having its periphery some distance inside the wall of the conduit, a housing supported

within the receptacle some distance above the orifice, a vertical solenoid in said housing, said rod extending through the base of the housing into the solenoid, an iron core connected with the upper end of the rod, said core having an extension projecting above the solenoid, a head on the extension, and a compression spring surrounding the extension and compressed between the head and the top of the solenoid, and conductors leading from outside the receptacle to the solenoid.

8. The combination of a receptacle having a funnel-shaped lining within the bottom thereof, and a discharge orifice, a housing within said receptacle supported above said orifice, a solenoid within said housing, a rod extending therethrough and projecting downwardly through said orifice, and a valve on the lower end of said rod for cooperation with said orifice.

9. The combination of a receptacle having a funnel-shaped bottom, a plate within said funnel having a discharge orifice, the edge of said plate around said orifice extending downwardly to constitute a valve seat, a housing within said receptacle supported on legs above said plate, a solenoid within said housing, a rod connected to the core of said solenoid and projecting downwardly through said orifice, and a valve head on the lower end of said rod for cooperation with said valve seat.

10. In combination, a receptacle, the bottom portion thereof having an opening, a valve seat therefor comprising a plate having an orifice therein surrounded by a downwardly turned edge, a housing mounted within said receptacle above said plate, a solenoid within said housing and a rod extending from said solenoid through said orifice, a valve head on said rod adapted to coöperate with said valve seat, and a conduit surrounding said valve secured to the bottom of said receptacle.

11. The combination of a receptacle having a flat bottom and an orifice therein, an annular member secured thereto having its inner edge downwardly turned to project through said orifice and constitute a valve seat, a funnel shaped lining near the bottom of said receptacle surrounding said member, a housing within said receptacle spaced from the walls thereof and from said lining, a valve vertically movable below said valve seat, and means within said housing for operating said valve.

12. The combination of a receptacle having a flat bottom and an orifice therein, a valve seat comprising a plate having an orifice, the edge of said plate around said orifice being bent downwardly and adapted to project through said orifice in the bottom of the receptacle, a funnel shaped lining within said receptacle surrounding said plate, a housing within said receptacle supported on legs above said plate, a rod within said housing extending downwardly therefrom through said valve seat and having a valve on the lower end thereof, and means within said housing for operating said rod and valve.

In testimony whereof I hereunto affix my signature.

WILLIAM LINTERN.