Aug. 2, 1927. 1,637,609

T. S. GILMORE

PNEUMATIC SANDER

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Fig. I.

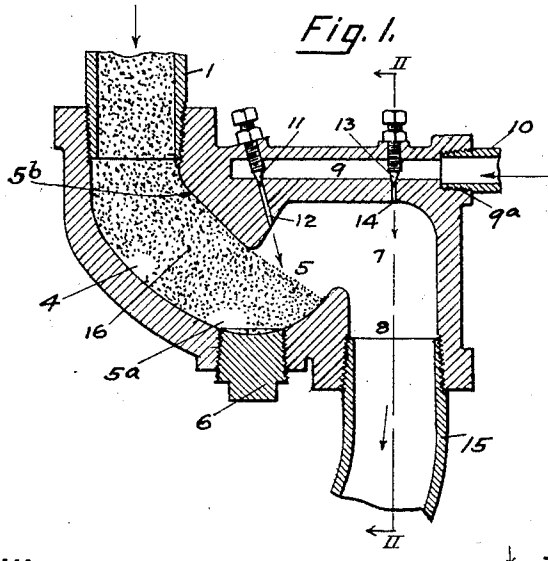


Fig. III.

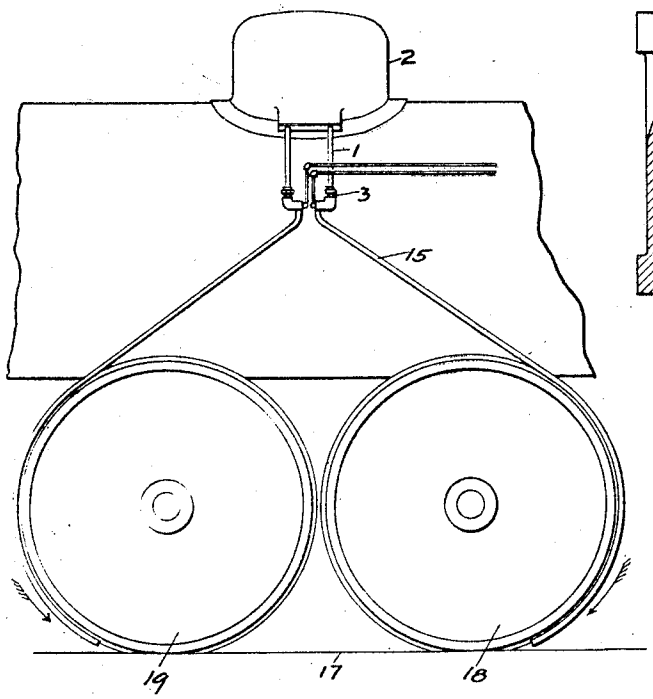
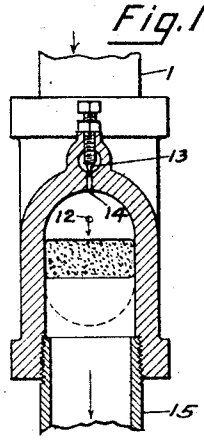


Fig. II.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC SANDER.

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My invention relates to traction sanders as a class.

The object of my invention is to provide a device of this class, which has an apparatus for pneumatically loosening and starting the movement of the lower portion of a contained sand column and thereafter to accelerate the discharge of such sand toward a pre-determined location. The device is particularly intended for locomotives and vehicles which travel upon and over fixed rails, but may be adapted to other vehicles requiring traction aid. I attain these objects, as well as other advantages, by the construction, combination and arrangement of parts illustrated in the accompanying drawings which form a part hereof.

Fig. I is a side sectional view of the device as arranged for sand discharge in advance of a traction wheel.

Fig. II is a view on the line II—II in Fig. I partly in section.

Fig. III is a side elevation of part of a locomotive boiler with sand dome or reservoir and two traction wheels, with the device indicated in connection therewith in operative positions.

Like characters refer to like parts in the views.

A conveyor pipe 1 extends from a sand supply reservoir, such as 2 on a locomotive, downwardly to a convenient location, herein shown at 3, the end of the pipe being threaded. My device is secured upon the lower end of this pipe as shown. Its casing has a downwardly curved passage 4 from the pipe 1 to an outlet 5 arranged at a conveniently directed inclined angle. From the outlet 5 the upper, inner surface of the pipe is inclined at an angle extending to the pipe 1, which angle is substantially in alignment with the center of the outlet and the surface of the sand while remaining in repose across the outlet 5. The surface referred to is indicated at 5^b. The lower portion of the passage thus forms an approximately horizontal trap 5^a, which retains the foot of a sand column in repose therein and prevents the flow of sand through the passage by gravity force. A sump plug 6 is positioned in the lower portion of the trap 5^a to afford access to it from below. From the outlet 5 a chamber 7 extends at right angle, with a vertical, downwardly positioned outlet 8 at its opposite end which is inwardly threaded. Above the chamber there is a horizontal recess 9, threaded at its opening 9^a. A pipe 10 extends from a source of air supply under pressure to a connection with the recess 9 in its opening 9^a. A needle valve 11 is seated in the upper end of a discharge passage or duct 12 extending from the recess 9 at a convenient angle and in a direction toward the central part of the outlet 5. Another needle valve 13 is seated in the upper end of a discharge passage or duct 14 extending vertically from the recess 9 into the chamber 7 and in alignment above and with the central part of the outlet 8. A pipe 15 extends from a connection with the chamber outlet 8 to a pre-determined position of discharge at its free end. A similar arrangement of pipes and the device is shown in Fig. III for a discharge of sand in a horizontal plane but in an opposing direction to that first described. Common sand 16 is shown positioned in the passage 4 and trap 5^a. In Fig. III the pipe 15 is shown extending to a position for discharge upon a rail 17 in advance of a locomotive driving wheel 18 travelling forwardly thereon. The like pipe of the opposing system is shown extending to a position for discharge in advance of a locomotive driving wheel 19 travelling upon a rail 17 in the reverse direction to that first mentioned.

The operation will now be described.

The valve 11, which I will call a spreader valve, is set for a convenient and desired quantity of air discharge under pre-determined pressure, toward the opening 5. The valve 13, which I will call an accelerating valve, is also set for a convenient and desired quantity of air discharge under pre-determined pressure, toward the opening 8. It will now be seen that when air under pressure is admitted into the recess 9 from the pipe 10, and by the spreader valve to the duct 12, the blast from the duct 12 breaks up and blows the sand in the trap 5^a through the opening 5 into the chamber 7, and the gravity force of the sand column in the pipe 1 causes the trap to receive a supply continuously as long as the air is admitted. The blast from the duct 12 strikes the sand approximately near the center of the opening 5 and the inclined pipe surface 5^b allows the sand to flow freely along its upper portion toward this point and the blast carries it over the curved lower surface of the outlet into the chamber 7. When the air is thus blown into the chamber 7, it is pre-

vented from lodging there or forming into a whirling mass by downward pressure of air admitted by the accelerator valve 13 into the duct 14 and thence into the chamber 7, which forces the sand through the pipe 15 to the place of discharge. Upon shutting off the discharge of air through the pipe 10 the foot of the sand column regains its position of repose as shown and the discharge of sand ceases. The operation of the opposing system in the reverse direction of sand discharge is similar to that just described.

It is well known that heretofore, in the common apparatus applied to locomotives for the discharge of sand upon the rails to aid traction, the sand often becomes wet or hardened into lumps which clog the discharge pipes or trap and prevent the sand from flowing freely for the purpose indicated. These difficulties have not as yet been completely overcome. There can be no dispute as to the necessity for such an apparatus to function with regularity and instant promptness, for the reason that the operation of a locomotive, to which it may be attached, involves the safety of life and property. My device herein shown has been tested and proven to be efficient in overcoming the difficulties referred to. It is new and useful, also, by reason of its simple construction, it can be manufactured and installed for use at a very moderate charge, upon vehicles for which it is adapted.

I claim:

1. In a sanding device, a casing having an intake, a curved passage extending therefrom to an outlet directed at a convenient upwardly inclined angle, the lower portion of said passage forming an approximately horizontal trap, a chamber adjacent to said outlet, having a downwardly facing discharge outlet, the upper, inner surface of said passage being inclined at an angle from the intake substantially in alignment with the center of the outlet.

2. In a sanding device, the combination of; a casing having an intake, a curved passage extending therefrom to an outlet directed at a convenient upwardly inclined angle, the lower portion of said passage forming an approximately horizontal trap, a chamber adjacent to said oulet, having a downwardly facing discharge outlet, an air recess above the chamber, having a first duct extending therefrom into and toward the central part of said curved passage outlet at a pre-determined angle, a valve seated in the upper end of said duct, a second duct extending from said recess into said chamber for discharge therefrom toward the central part of the chamber outlet and a valve seated in the upper end of said second duct.

3. In a sanding device, the combination of; a casing having an intake, a curved passage extending therefrom to an outlet directed at a convenient upwardly inclined angle, the lower portion of said passage forming an approximately horizontal trap, a chamber adjacent to said outlet, having a downwardly facing discharge outlet, an air recess above the chamber, having a first duct extending therefrom into and toward the central part of said curved passage outlet at a pre-determined angle, a valve seated in the upper end of said duct, a second duct extending from said recess into said chamber for discharge therefrom toward the central part of the chamber outlet, a valve seated in the upper end of said second duct, a pipe extending from a source of sand supply to and into the said casing intake, and a pipe extending from said casing discharge outlet to a selected position for discharge from its opposite end.

4. In a sanding device, the combination of; a casing having an intake, a curved passage extending therefrom to an outlet directed at a convenient upwardly inclined angle, the lower portion of said passage forming an approximately horizontal trap, a chamber adjacent to said outlet, having a downwardly facing discharge outlet, an air recess above the chamber, having a first duct extending therefrom into and toward the central part of said curved passage outlet at a pre-determined angle, a valve seated in the upped end of said duct, a second duct extending from said recess into said chamber for discharge therefrom toward the central part of the chamber outlet, a valve seated in the upper end of said second duct, a pipe extending from a source of sand supply to and into the said casing intake, a pipe extending from said casing discharge outlet to a selected position for discharge from its opposite end, and a pipe extending from a source of compressed air supply to and into said air recess.

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