

July 27, 1943.

A. E. TUCKER ET AL

2,325,441

ACTUATOR FOR TRACK SANDERS

Filed July 5, 1940

2 Sheets-Sheet 1

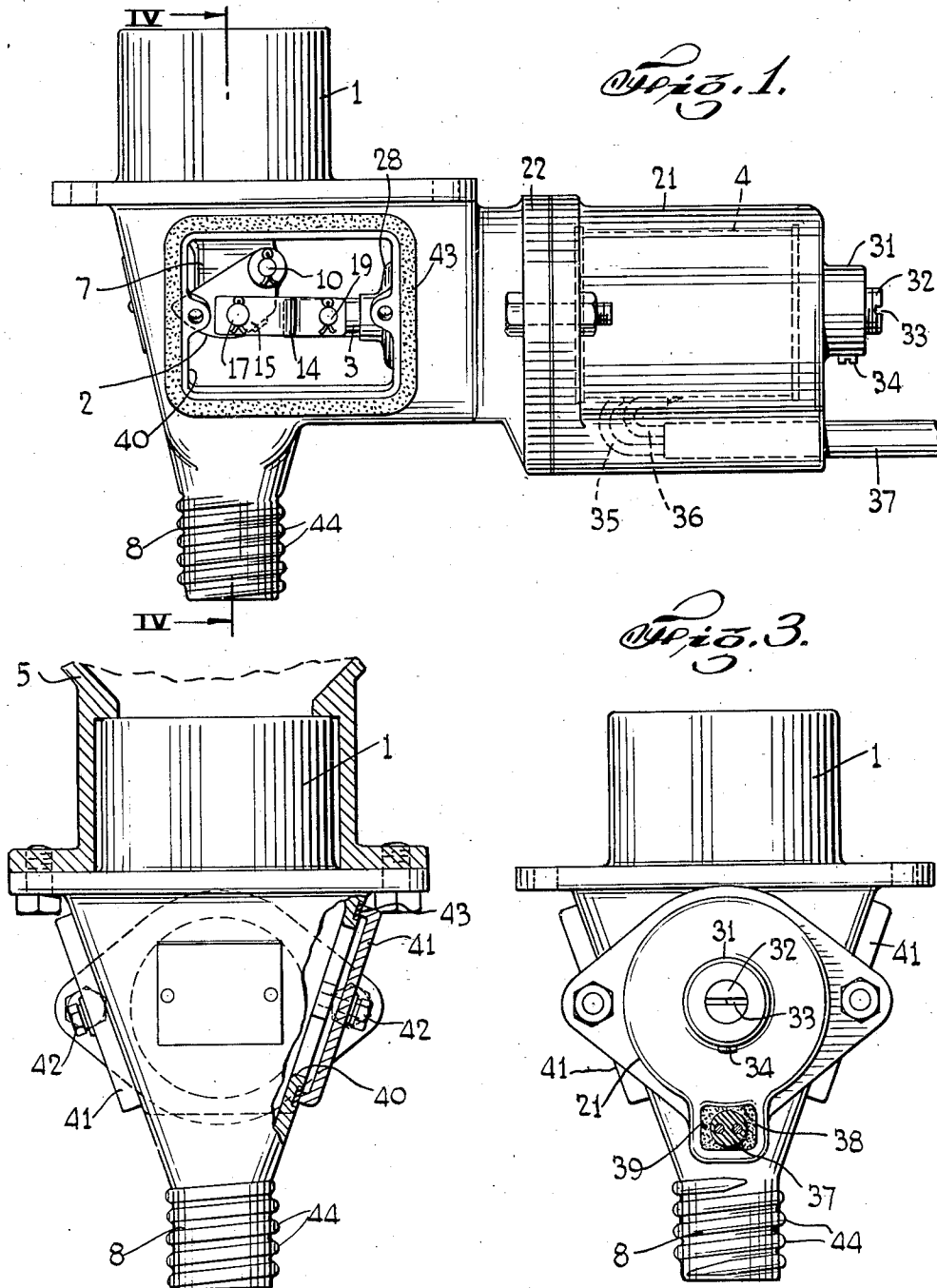


Fig. 2.

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2 Sheets-Sheet 2

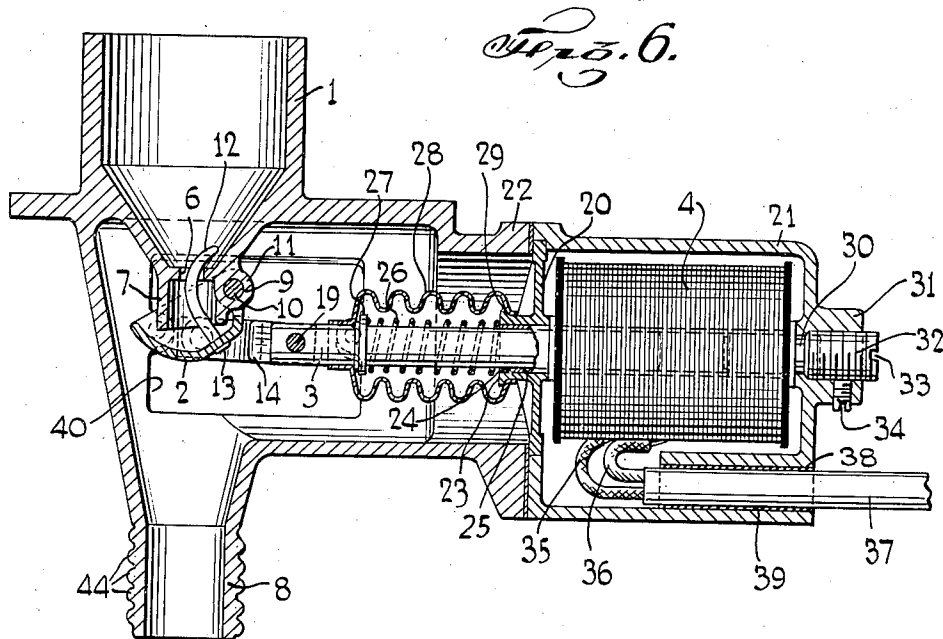


Fig. 4.

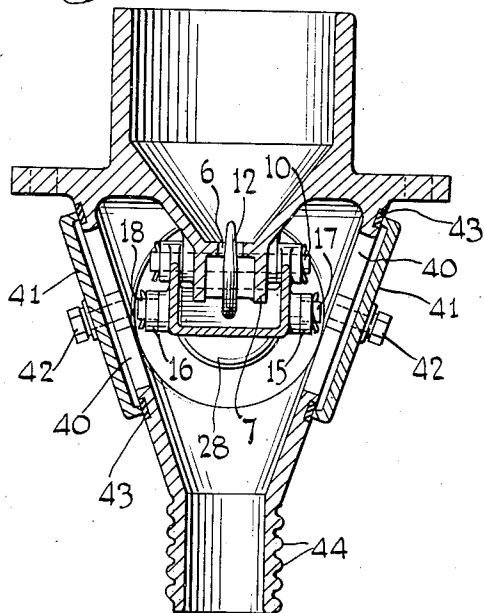
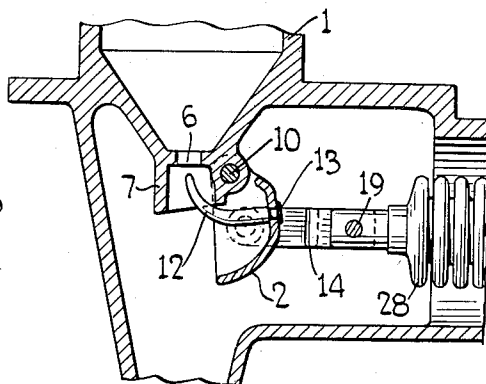


Fig. 5.



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ACTUATOR FOR TRACK SANDERS

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Application July 5, 1940, Serial No. 343,960

1 Claim. (Cl. 291—23)

This invention relates to track sanders and particularly power operated track sanders.

A principal object of this invention is the production of track sander, preferably power operated, which embodies a sand flow orifice and a means for preventing a flow of sand from said orifice which is devoid of close fitting parts in those portions which come directly in contact with the sand.

A further object of the invention is to provide a device of the character specified which will also include means for freeing the sand orifice of lumps and caked sand which is movable synchronously with the means for preventing the flow of sand from the orifice.

A further object of the invention is the provision of a device of the character specified which embodies a reciprocating plunger for operating the sand valve or means for preventing sand from flowing from a sand orifice which plunger is protected for a major portion of its length from coming in contact with sand or dust from the sand.

Other objects and advantages will appear as the description of the particular physical embodiment selected to illustrate the invention progresses, and the novel features will be particularly pointed out in the appended claim.

In describing the invention in detail and the particular physical embodiment selected to illustrate the invention, reference will be had to the accompanying drawings and the several views thereon, in which like characters of reference designate like parts throughout the several views, and in which:

Figure 1 is a side elevational view of a track sander embodying my invention with a cover plate removed to more clearly show the internal construction; Fig. 2 is an end elevation of the track sander shown by Fig. 1 viewed from the left hand side thereof and with some parts broken away to more clearly show the construction; Fig. 3 is an elevational view of the track sander as shown by Fig. 1 as viewed from the right hand end thereof; Fig. 4 is a vertical cross-sectional view of the device as shown by Fig. 1 on the plane indicated by the line IV—IV of Fig. 1; Fig. 5 is a fragmentary, longitudinal cross-sectional view of the track sander as shown by Fig. 1 with the sand valve shown in a different position from that as shown in Fig. 1; Fig. 6 is a longitudinal cross-sectional view of the sander as shown by Fig. 1.

The track sander of applicants' invention comprises, broadly, a sand bucket or reservoir 1, a pivoted cup or sand valve 2, and a plunger 3 operable by solenoid 4. When the solenoid 4 is energized the plunger 3 operates the cup or valve 2 to remove it from underneath the reservoir and the sand in the reservoir flows thereout.

When the cup or valve 2 is in the position as shown in Fig. 6, the sand does not flow from the reservoir. The bucket or reservoir 1 as shown in the drawings does not have the proper volumetric capacity to contain a practicable quantity of sand and so in practice, it would be supplemented by a more capacious reservoir 5 as shown in Fig. 2. The reservoir or bucket 1 is preferably formed with the lower part of its walls converging, as clearly shown in Fig. 3, so that they really form a frustum. In this case, the frustum of a cone. The end of the cone is formed with an orifice 6 and beyond the orifice 6 the walls are preferably continued as at 7 to form a chamber or nozzle. If the orifice 6, its continuations, or the mount of the nozzle 7 is unobstructed, sand in the chamber can flow therefrom and drop into the delivery spout 8 and from thence be conveyed to any desired point by any suitable means.

In order to govern the flow of sand from the reservoir 1, applicants provide a sand valve or cup 2. This cup 2 is orificed at 9 to receive a pivot pin 10 which is supported by the boss 11 on the lower end of the reservoir. The cup 2, in the sand flow preventing position, occupies a position as shown in Fig. 6 with its upper edge somewhat beyond the lower edge of the nozzle 7. In such position the sand will not flow out of the nozzle although there is a free exit for it around the outer edge of the lower part of the nozzle 7. If the cup or sand valve 2 is moved to the position as shown in Fig. 5 then the sand may flow freely from the reservoir 1 into the supply nozzle 8.

As the orifice 6 may become clogged due to caking of the sand or lumps, applicants provide a prong or stirrer 12. This prong or stirrer is preferably attached to the cup 2 in any suitable or appropriate manner, as by riveting at 13, and for substantially the greater portion of its length is formed with a curvature having the center of the pin 10 as the radial center. The prong 12 moves up and into the orifice 6 when the cup 2 is placed in the position as shown in Fig. 6 and is withdrawn therefrom when the cup 2 is placed in the position as shown by Fig. 5.

Although the cup 2 and the prong 12 attached thereto have been described as being preferably pivoted so as to swing up into a position and swung down out of position, nevertheless, it is desired to have it understood that such specific description is not intended to exclude other forms of construction which could equally well be used to bring the cup 2 substantially into the position as shown by Fig. 3 and remove it therefrom so as to leave the orifice from the reservoir substantially unobstructed.

In order to move the cup upon its pivot 10, applicants preferably provide the bifurcated

member 14 provided in each leg thereof with a trunnion bearing as 15 and 16 in which the trunnions as 17 and 18 extend. The bifurcated member 14 is pivotally attached as by the pivot 19 to the plunger 3. The above construction allows the proper movement between parts so that the cup or bucket 2 will move as hereinbefore described upon a reciprocation of plunger 3.

The solenoid 4 is positioned in a chamber separate and apart from the chamber in which the bucket 2 and the plunger 3 are positioned. This solenoid chamber is separated from the bucket chamber by a separate and independent wall 20 which is secured in position by being clamped between the solenoid chamber wall 21 and the cup chamber wall 22. This separate and independent wall is provided at the center with a boss 23 formed with a through orifice 24. A tube 25 extends through the solenoid 4 and through the orifice or bore 24 and supports the solenoid and also provides a pocket for plunger 3.

A helical spring 26 surrounds the plunger 3 and bears at one end against the boss 23 and at the other end against an abutment such as a ring 27 attached to the plunger 3. This spring, when the solenoid 4 is not energized, forces the plunger 3 to the left as viewed in Fig. 6.

In order to prevent any sand or dust from the sand getting in between the plunger 3 and the tube 24 applicants provide a boot 28 about a major portion of the plunger 3. This boot is cylindrical in general form and one end closely clasps the boss of the independent wall 20 and is prevented from being pulled thereoff by the abutment 29 thereon. The other end of the boot 28 closely clasps the plunger 3 and is attached thereto in any suitable or appropriate manner as by welding. The boot 28, although cylindrical generally in form, is corrugated so that it is a sort of bellows and being made preferably of metal it may expand and contract longitudinally as the plunger 3 reciprocates to the left and to the right as viewed in Fig. 6.

In order to adjust and limit the extent of movement of plunger 3 and also to assist in supporting one end of solenoid 4, a stop 30 is positioned in the tube 24 at its right hand end. This stop extends through the boss 31 of the wall 21 and is formed with threads on its outer end 32 to cooperate with threads formed in the through bore of the boss 31. The stop is provided with a screw driver slot 33 for facilitating adjusting and is held in adjusted position by the set screw 34.

The terminals 35 and 36 of the solenoid 4 are preferably formed into a cable as 37 and this cable is preferably passed through a bore 38 in the wall 21 and the entrance sealed by pouring or otherwise placing therein insulating compound 39.

The operation of the device is quite obvious. When it is desired to supply sand to the nozzle 8 the solenoid 4 is energized which causes the plunger 3 to move to the right as viewed in Fig. 6. The movement of plunger 3 to the right moves sand valve or cup 2 on the pivot 10 so as to put it into the position as shown in Fig. 5 thereby allowing free movement of sand from reservoir 1. When sufficient sand has been supplied to the nozzle 8, the circuit of the solenoid 4 is broken and spring 26 returns the plunger 3

to the position as shown in Fig. 6 thereby returning the sand valve or cup 2 to the position as shown in Fig. 6. During both the opening and the closing movement, the prong 12 thoroughly agitates any lumps or caked sand which may be in or about the orifice of the reservoir.

The construction illustrated and described is such that the sand valve itself includes no close fitting parts which come in contact with the sand so that the danger of sticking or rapid wear is avoided.

As not only the sand itself but the dust therefrom is very destructive to metal parts moving very close to one another, the life of plunger 3 is greatly prolonged by the efficient boot 28 which is positioned about the major portion thereof and which prevents any sand or dust from sand from getting between the plunger 3 and the tube 24 and so causing an excessive wear.

If any of the parts do become defective ready access is afforded thereto by the hand hole such as 40 provided at each side of the bucket 2, each of which is covered by hand hole plate as 41 and each hand hole plate is held in place by bolts as 42. It is preferred to use a gasket as 43 around the edge of the plate 41 to prevent any sand dust from seeping out and getting into adjacent machine parts.

The nozzle 8 has been provided with a screw thread 44 to facilitate the attachment of a hose or other duct for conducting the sand to a desired point.

Although we have particularly described one particular physical embodiment of our invention and explained the operation, construction and principle thereof, nevertheless, we desire to have it understood that the form selected is merely illustrative but does not exhaust the possible physical embodiments of the idea of means underlying our invention.

What we claim as new and desire to secure by Letters Patent of the United States, is:

An actuator for a sander, including in combination: a solenoid; a central tube partly within the solenoid; walls forming a chamber within which the solenoid is positioned, one of said walls being separate and independent, said last mentioned wall being formed with a central boss formed with a through bore through which said tube extends for supporting the solenoid at one end, the wall opposite to said separate and independent wall also formed with a central boss formed with a through bore; a plunger stop positioned in the last mentioned bore and extendible into the tube; a plunger composed of magnetic material within the tube; means including resilient means for normally maintaining the plunger in an outwardly projected position and a boot formed of relatively flexible material as a corrugated cylinder surrounding the plunger for a portion of its length beyond the separate and independent wall on the side remote from the solenoid, said boot closely surrounding the boss on the wall at one end and closely surrounding and attached to the plunger at the other end whereby a movement of the plunger compresses or distends the corrugated cylinder and undesired material is prevented from entering between the plunger and the tube, and means operated by the plunger whereby sand is allowed to escape.

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