April 5, 1927. 1,623,743

T. F. McGUINESS

MACHINE FOR DISTRIBUTING SAND AND THE LIKE

Filed May 1, 1925 2 Sheets-Sheet 1

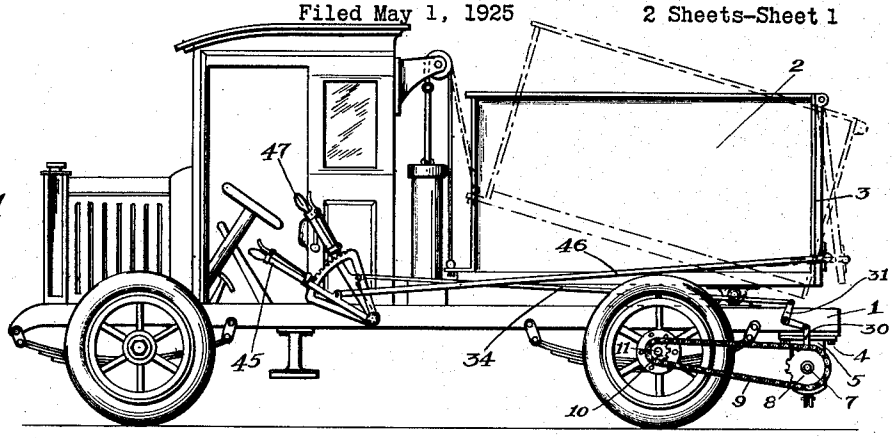


Fig. 1

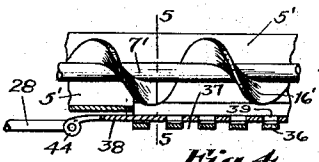


Fig. 4

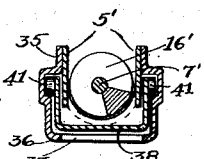


Fig. 5

Fig. 2

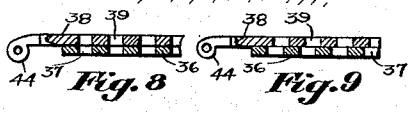


Fig. 8 Fig. 9

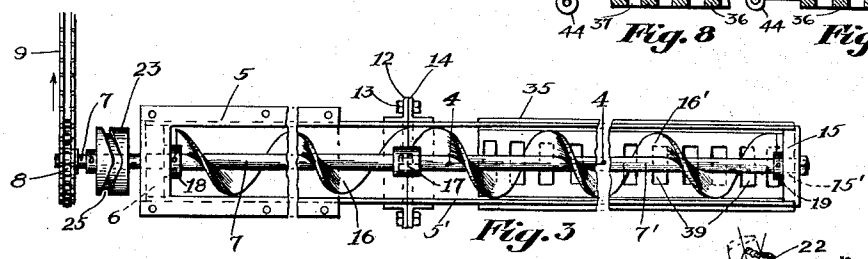


Fig. 3

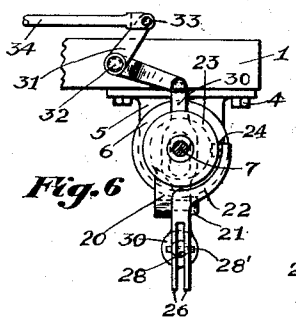


Fig. 6

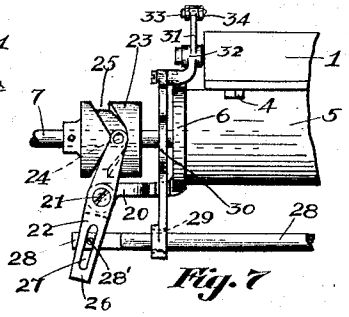


Fig. 7

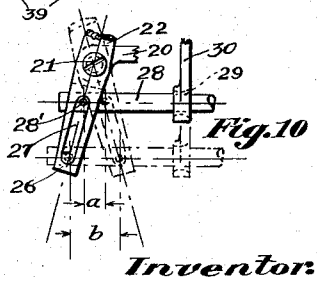


Fig. 10

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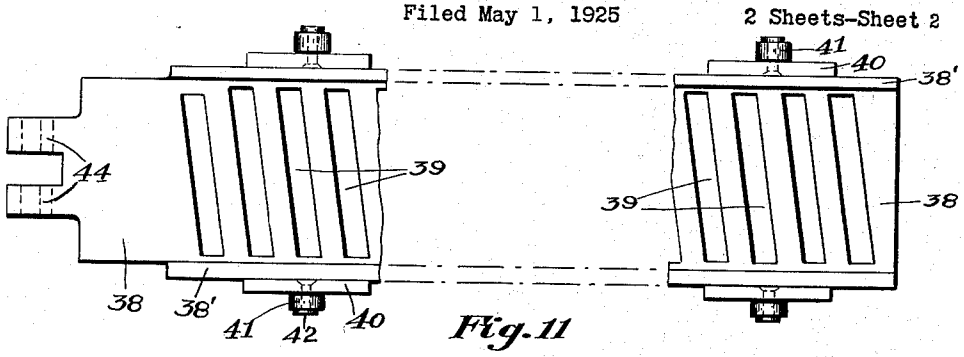


Fig. 11

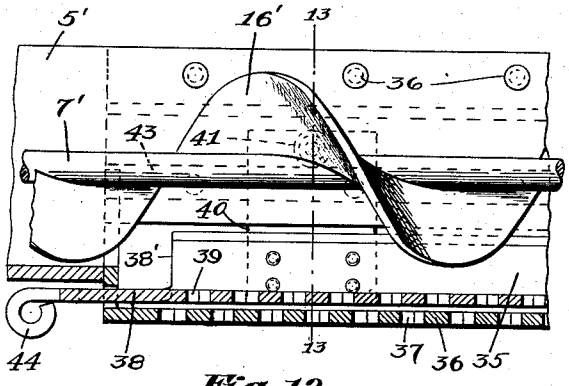


Fig. 12

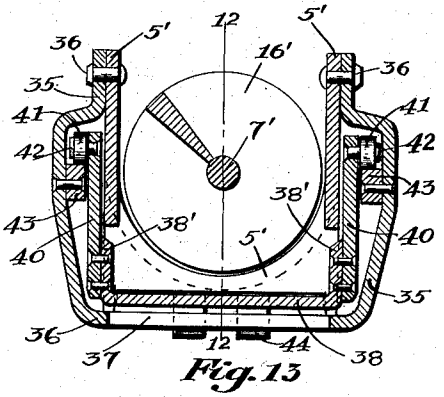


Fig. 13

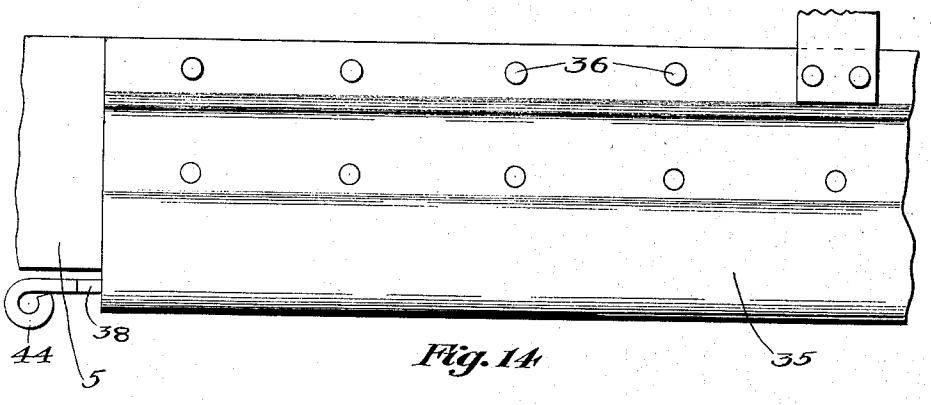


Fig. 14

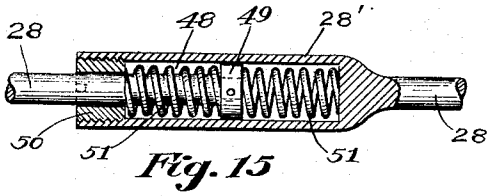


Fig. 15

Inventor:

Thomas F. McGuiness.

Patented Apr. 5, 1927. 1,623,743

UNITED STATES PATENT OFFICE.

THOMAS F. McGUINESS, OF PORTLAND, MAINE.

MACHINE FOR DISTRIBUTING SAND AND THE LIKE.

Application filed May 1, 1925. Serial No. 27,312.

My invention relates to a device for distributing or spreading sand or fine gravel over a road-bed the surface of which has just previously been covered with oil or any commonly used tar products.

The purposes of my invention will be enumerated forthwith, but previous to their consideration it might be well to outline, briefly, the method usually pursued in the application of oil and sand to the road surface, for its protection.

In the first place, and previous to the time when the road surfacing work is to be done, quantities of sand are hauled to the section to be operated upon and dumped in small piles at the sides of the road. These piles are simply approximations of the amount needed and generally contain considerably more sand than is actually required.

The oiling machine is next brought into action and a thin layer of oil is run over the road surface. This oil is quite often heated previous to being put into the tank vehicle and when applied flows very freely over the surface of the road.

It is quite essential that the sand be spread over the oil as soon thereafter as possible in order to prevent its waste by flowage to the gutters of the street, and also that there may be a sufficient quantity remaining on the road surface with which the sand may be mixed and bound.

As the oiling is accomplished very quickly a large area may be covered in a short time. This makes the subsequent operation of sanding the more difficult, for, unless a large crew of workmen are engaged in the work the sanding does not keep pace with the oiling and this delay in covering the oil results in quite a large proportion of the latter being lost by flowing to the sides of the highway.

Then too, there are comparatively few workmen who are proficient in this class of work. There are sure to be thickly and thinly covered sections when the spreading is done by hand shovelling, and after a few days exposure to the sun, with the continual vehicular traffic thereover, the thinly covered portions will dry out to such an extent that the sand is very soon blown from the road, leaving it with no protective covering.

Furthermore, the repeated pound of traffic over these spots will soon break the crust of the road surface and the depressions thus made becoming enlarged will necessitate expensive repairs and leave the road in a more or less rough state.

One of the objects of my invention is to provide a machine which, preferably, may be mounted on the rearward end of an ordinary dump-body truck and by the locomotive power of the truck and the co-acting elements of the device distribute sand over the previously oiled surface of a road-bed,—the parts to be so constructed as to be easily attachable to the frame of the truck, when the sanding operation is to be performed, and as readily detached to make the vehicle available for any other purpose.

Another object of my device concerns its ability to perform a more satisfactory service in that the sand is more evenly distributed, in contrast to the hand spreading method, and also makes provision for a variable feed, so that a larger or smaller quantity of the material may be dropped,—the amount required depending on the condition of the oil and the road surface.

And still another object, and perhaps the most important from the standpoint of the road official, is the matter of the cost of doing the work. With my distributer I am able to cover the oil as quickly as the latter was flowed over the road, and do it at just the proper time; the machine will accomplish, with a single truck operator, more than a large crew of hand-shovellers can in a day's run of work, and will do it more efficiently.

Other objects of my invention will be apparent from reading the description hereinafter contained in this specification when taken in connection with the annexed drawings in which a preferable embodiment of my invention is illustrated and in which like characters of reference indicate similar parts throughout all the different views.

In the drawings:

Fig. 1 is a side elevation of a dump-body truck with my distributer attached thereto;

Fig. 2 is a rear end elevation of the same;

Fig. 3 is a fragmentary plan view of the supply and distributing boxes with attached parts;

Fig. 4 is a fragmentary sectional elevation taken on line 4—4, Fig. 3;

Fig. 5 is a transverse sectional elevation taken on line 5—5, Fig. 4;

Fig. 6 is an end elevation of the feed actuating parts;

Fig. 7 is a side elevation of the same;

Fig. 8 is a section, taken on line 4—4, Fig. 3, and shows the ports of the slide and the bottom of the box full open;

Fig. 9 is the same but with the ports partially closed;

Fig. 10 is a view showing the feed adjustment features of the slide;

Fig. 11 is a fragmentary plan view of the ported slide;

Fig. 12 is a fragmentary sectional elevation of the slide, box and feed screw taken on line 12—12, Fig. 13;

Fig. 13 is a sectional elevation of the parts taken on line 13—13, Fig. 12;

Fig. 14 is a fragmentary side elevation of the distributing box, and Fig. 15 is a section through the slide rod safety device.

Referring to the drawings, 1 represents the frame of a truck, 2 a dumping body, 3 the tail-board for the same. Attached by bolts 4, or otherwise properly secured to the rearward end of the frame 1, is the supply box 5, having an open top and a semi-circular bottom. At one end of the box (5) is a head 6, through a bearing in which is journalled the shaft 7. Fixed to the end of this shaft (7) is a sprocket wheel 8, running over which is the sprocket chain 9. The wheel 8 and the chain 9, together with the sprocket wheel 10 which is fixed on the outer end of the truck axle 11, constitute the driving means for the shaft 7.

At the end opposite to the head 6, the supply box 5 is supplied with a flange 12, and secured by the bolts 13, to this flange (12) is a similar flange 14 secured to the inner end of the distributing box 5′. At the outer end of the box 5′ is the head 15 and in a bearing in which 15′ operates the outer end of the shaft 7′.

Mounted on the shaft 7 is the spiral conveyor 16 and at 17 is a coupling with a squared recess made to fit the squared end of the shaft 7′. A counterpart of the conveyor 16, 16′, is fixed on the shaft 7′, making a substantially continuous conveyor along the whole length of the interior of the boxes 5 and 5′. These conveyors may be cut at intervals along the shafts 7 and 7′ and bearings, not shown in the drawing, to support the shafts, placed within the boxes. Collars 18 and 19 carry the thrust of the shafts 7 and 7′ against the heads 6 and 15, respectively. As will be seen, by this construction I may completely detach the distributing from the supply portion of the box.

Integral with the head 6 is a bracket 20, pivotally hung on which, over the pin 21, is the lever 22. The upper portion of this lever (22) is arcuate in form and partially surrounds the cam 23. A roll 24 pivoted on the upper end of the lever (22) operates in, and is engaged by the sides of, the cam path 25. The cam 23 is fixed on the shaft 7, and rotation of the cam imparts to the lever 22 an oscillatory movement.

The lower portion of the lever 22 is bifurcated and each bifurcation, 26, has transverse slots 27 cut therein. Between these bifurcated parts operates the rod 28, flattened where it passes through. A pin 28′ is fixed in the rod 28 and extends through the slots 27. Thus when the lever 22 oscillates there is a reciprocatory movement produced in the shaft 28 held in the bearing 29 of the hanger 30. This latter member is susceptible of a vertical movement through its pivotal connection to one arm of the bell-crank lever 31 which is pivoted to the frame 1 at 32 and has on its opposite arm pivotal connection at 33 with the reach rod 34.

Observing the Figs. 3, 4, 5, 12 and 13, 35 is an outer box secured, by the rivets or bolts 36, to the extended portions of the distributing box 5′. The bottom 36 of this member (35) has numerous ports or passages cut therethrough. These ports, 37, are preferably cut diagonally so as to better distribute the sand in an even manner over the road surface. Positioned at a spaced distance above the bottom 36 is a ported slide member 38, the ports 39 likewise being cut diagonally and to match those cut in the bottom. The slide (38) has upturned sides 38′ and attached at intervals along its length are narrow plates or gussets 40 extending upwardly and having rolls 41, rotatable over studs 42, projecting outwardly and designed to run over the tracks 43 which are fixed to the inner sides of the outer box 35.

One end of the slide is bifurcated at 44 and within the bifurcation is pivoted the end of the rod 28, as seen in Figs. 2 and 4. It will thus be seen that any movement of the vehicle wheels will cause the slide 38 to reciprocate through the means of the interconnecting parts, and will have the effect of opening and closing the passages through the distributing box 5′.

In Figs. 4 and 12 this passage is shown completely cut off. In Fig. 9 it is shown partially open, and in Fig. 8 wholly so.

It is very essential that means be provided to vary, at times, the quantity of sand being spread on the oiled surface of the road. To accomplish this object I employ the parts, some of which I have already described, which are illustrated in Figs. 1, 6, 7 and 10 of my drawings. On the vehicle, near the driver's seat, are hand levers, one of which, 45, is used to actuate the tail-board 3 through the connecting reach rod 46. This will allow the driver, or an operator whose duty it is to attend solely to the feeding of the sand, to regulate the gravitation of the latter in the proper amounts from the dump-body to the supply box 5.

The other lever, 47, to which the reach rod 34 is pivotally attached, controls the vertical action of the hanger 30. In Fig. 10 the result of raising or lowering this member (30) is graphically shown. In its upper position, shown in full lines, the arc of action, or one oscillation, of the pin 28′ will move the shaft 28 a distance represented by the space *a*. By lowering the hanger, which carries the shaft 28 with it, to the position shown in dot and dash lines this movement of the shaft 28 through one oscillation of the pin 28′ will equal the space marked *b*.

It is therefore possible by manipulating the hand lever 47 to produce, at the will of the operator, a greater or lesser width of effective opening through the slide and bottom passages, with a consequent dropping of a larger or smaller amount, respectively, of the sand.

Particular attention is called to the fact that the slide 38 is suspended a spaced distance above the bottom 36 of the distributing box, thus eliminating a large amount of friction otherwise existent were they in rubbing contact, and more especially so when the properties of the material in which they are immersed is considered. The object of placing the ports in a diagonal fashion is to prevent the sand from falling in wind-rows on the road surface, that is, in long streaks of sand instead of in a smooth even thickness.

As it is not always the practice to screen the sand or gravel before using it on the highways it frequently contains rocks or pebbles when deposited in the distributing box. If, in the process of operating the machine, one of these rocks should become lodged in one of the ports of the slide the positive action of the slide actuating mechanism would quite likely cause injury to some of the parts were it not for the safety device which is embodied in the construction of the slide connecting rod 28.

By reference to Fig. 15 a sectional detail of this element will be seen. It will be noticed that the rod 28 is divided,—one of the adjacent ends 28′ being enlarged and having a hole 48 bored therein. The other adjacent end is provided with a collar 49, somewhat larger in diameter than the rod, and fixed thereto. This collar is made so that it will be an easy sliding fit in the hole.

At the outer end of this hole, and threaded into it, is a bushing 50. Interposed between the collar 49 and the bushing 50, and also between the collar and the bottom of the hole 48, are helical springs 51. These springs are "set" sufficiently to hold the collar 49 in a substantially central position in the hole 48 under all ordinary working conditions. But should any obstruction be placed in the ports of the slide 38 or bottom 36, such as for instance a stone, then these springs may compress a certain amount, one doing so on the in-stroke and the other on the out-stroke of that portion of the rod 28 having the collar 49 thereon. This compression is of a sufficient amount to allow the actuating members, such as the cam 23, the lever 22 and the rod 28 to function without the possibility of breakage of any of these parts.

So as to be more conveniently transported from place to place I have constructed the supply and distributing boxes of the machine so that the latter may be detached from the former, and by disengaging the brace rods 52, which act as outriggers for the distributing box, I am able to strip the vehicle, equipped with the sanding machine, of all cumbersome and overhanging parts for the purpose of locomotion without interfering with traffic. These members may readily be re-assembled when the apparatus reaches the section to be sanded.

As will be apparent, after a careful reading of my specification, there may be certain features in the device which I may elect to modify in minor details, as for instance, the method of conveying the sand from the supply to the distributing box. While I have illustrated and described this particular element as being in the form of a spiral or screw conveyor the function of a feed for the sand will be equally existent and inherent in the device should I decide to adopt the old and conventional type belt or link chain conveyor. And it is understood that the design of this part, as well as others in general, shall not restrict me to the exact mechanical construction as hereinbefore described, and illustrated in my drawings, but that I shall be at liberty to depart from this exactness in so far as any deviation therefrom shall at all times conform to the spirit and intent of the invention and fall within the scope of the appended claim.

Having thus described my invention, what I claim is:

In a machine of the class described, comprising a box, a perforate bottom member for said box, a slide having perforations therein disposed in spaced relation to and vertically of said bottom member, upturned sides on said slide, a rail fixed to each side of said box, hangers fixed to and extending upwardly from the said upturned sides of said slide, a roll revoluble on the upper end of each of said hangers, said rolls adapted to traverse said rails and to support said slide suspended from a position a spaced distance from said bottom, partitions in said box running longitudinally thereof and separating the main, interior portion from the space in which said rails and said rolls are operable, and means to actuate said slide.

THOMAS F. McGUINESS.