July 30, 1940. F. S. BEACH ET AL 2,209,555

ROAD SANDER

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Fig. 5.

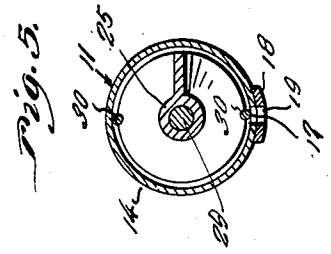


Fig. 6.

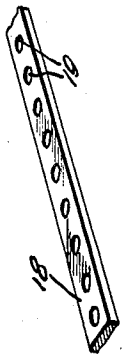


Fig. 8.

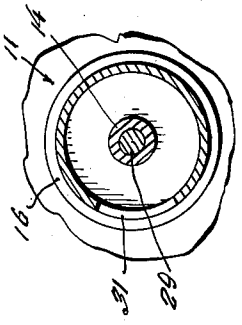


Fig. 1.

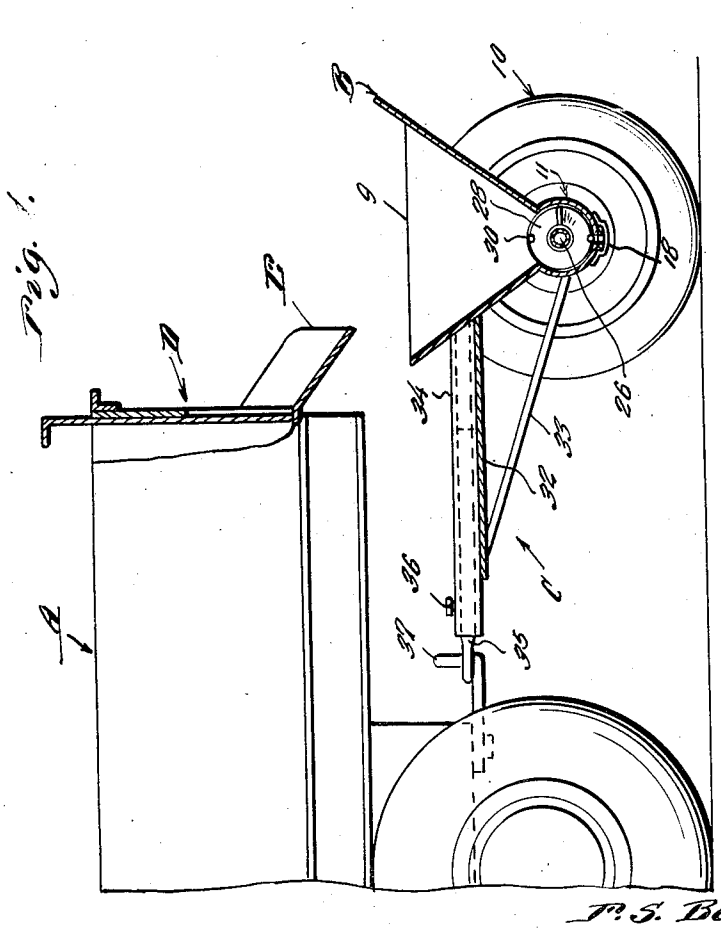
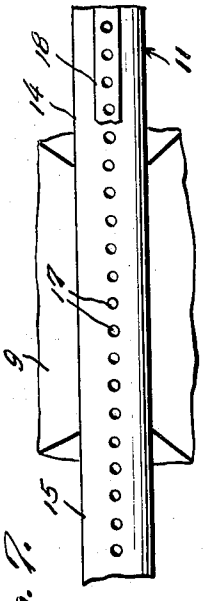


Fig. 7.



Inventors

F. S. Beach

F. H. Beach

By Clarence A. O'Brien

and Hyman Berman

Attorneys

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ROAD SANDER

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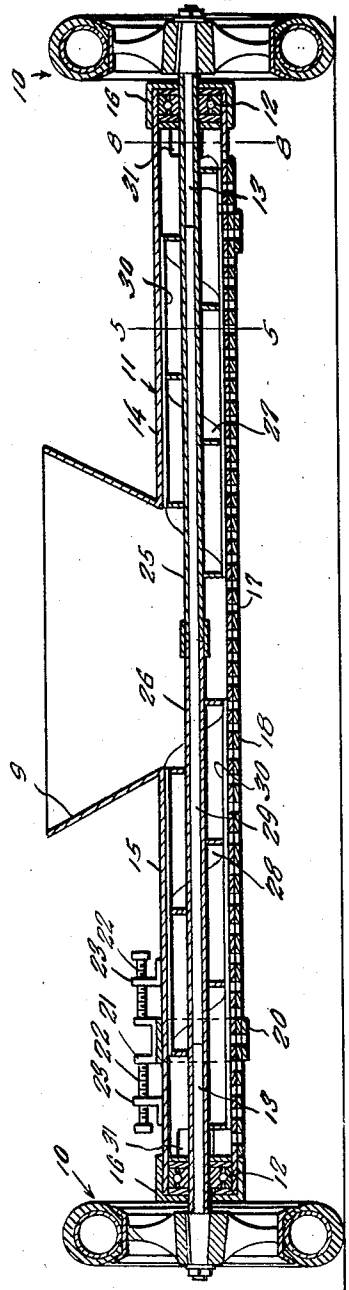


Fig. 2.

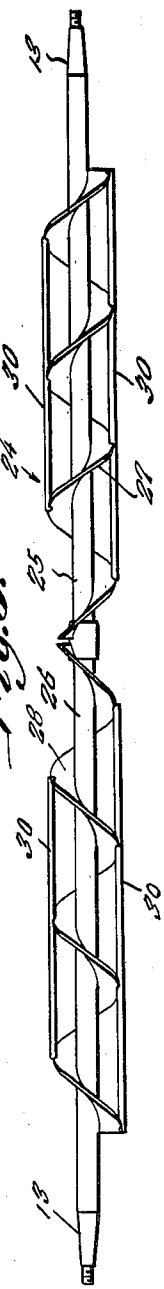


Fig. 3.



Fig. 4.

Inventors

F. S. Beach

F. H. Beach

By Clarence A. O'Brien

and Hyman Berman

Attorneys

Patented July 30, 1940 2,209,555

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ROAD SANDER

Fred S. Beach and Fitch H. Beach, Charlotte, Mich.

Application February 28, 1939, Serial No. 259,053

4 Claims. (Cl. 275—2)

The present invention pertains to ways and means of delivering and uniformly distributing and spreading sand, and/or salt, on and over slippery and ice-covered roads, highways and the like, and the principal object of the invention is to provide a more satisfactory, dependable and economical structure for accomplishing this traffic safety measure.

Needless to say, we are aware that various types of machines, vehicles and equivalent conveyances have been utilized for shoveling, broadcasting and otherwise disseminating sand on road surfaces. So far as we have been able to ascertain, however, there yet remains a dire need for the provision of structural means to accomplish the desired results with expediency and with the feeling of reassurance that the job will be well and economically done.

Briefly, in order to provide a structure susceptible of fulfilling the requirements of the trade, we have found it expedient and practicable to adopt a wheel-supported or equivalent portable trailer unit, this being attachable to the delivery or discharge end of a sand containing truck and being so devised and structurally perfected as to effectively receive and then spread the sand.

More specifically, and considering the preferred form in which the invention has been reduced to practice, we have developed a trailer unit in the form of a wheel-supported hopper, the hopper being carried by a horizontal transversely disposable tubular housing fashioned with valved discharge means and an internal screw conveyor for feeding the sand within the limits of the housing for uniform distribution.

Features and advantages in addition to those above touched upon will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a fragmentary side view showing a sand conveying and delivering truck with the improved distributor trailer unit coupled or hitched thereto, the trailer unit being constructed in accordance with our ideas.

Figure 2 is a horizontal longitudinal sectional view showing the essential details utilized to make up the so-called sanding trailer unit.

Figure 3 is an elevational view of the oppositely feeding twin screw conveyor or auger means.

Figure 4 is a perspective view of an assembling pin forming what may be called an inner bearing for the auger member.

Figure 5 is an enlarged transverse section on the plane of the line 5—5 of Figure 2.

Figure 6 is a fragmentary detailed perspective view of the slide valve.

Figure 7 is a bottom plan view showing a fragmentary portion of the hopper and sand receiving and distributing pipe or tube.

Figure 8 is an enlarged detail section on the line 8—8 of Figure 2.

Referring now to the drawings by distinguishing reference characters, the sand containing and delivering truck (which is of any appropriate conventional construction) is shown at A, this having attached to the discharge end thereof the improved sander-trailer unit B. Appropriate hitch or coupling means for the trailer is generally denoted at the point C. The truck has an appropriate end gate D provided with a chute E which overlies and registers with the receiver or hopper 9 of the trailer unit. Looking at the unit externally it has a pair of rubber tired wheels 10 at the outer ends of a tubular housing 11, the latter centrally supporting the hopper 9. As shown in Figure 2, roller bearing units 12 are fitted into the ends of the distributor tube or housing 11 and these serve to accommodate stub axles 13 fixedly connected with the hubs of the wheels. The casing or housing 11 may be said to embody duplicate oppositely extending branches 14 and 15, the outer ends being closed by dust caps 16 holding in place the ball bearing units. In its under side and directly over the road surface, the tube is provided with a series of ports or orifices 17, these being sufficiently proportioned and spaced to uniformly distribute the sand on the road surface. A simple valve plate 18 is utilized for regulating the sand discharge through said holes 17. The plate is slidably strapped in place and has openings 19 to register with the openings 17.

Any suitable means may be employed for shifting the valve. In the drawings, as shown at the left in Figure 2, a ring-like collar 20 slidably surrounds the casing and valve and is attached to the valve. The collar is provided with a U-shaped bracket 21 having feed screws 22 swivelly connected thereto and working through relatively fixed adjusting L-shaped brackets 23 on the casing. This provides a simple hand regulated mechanical control for opening and closing the valve.

The rotary conveyor and sand distributing means is in the form of a twin-auger assembly and

is shown to advantage in Figure 3. Unitarily, it is denoted by the numeral 24. It comprises a pair of hollow axles or hubs 25 and 26 formed with spiral augers 27 and 28 respectively. The aforementioned stub axles 13 project into the ends of the tubular or hollow axles 26 and are welded or otherwise rigidly secured thereto so that the turning of the wheels 10 serves to turn the respective augers or screw conveyor members. An assembling and stabilizing rod 29 fits telescopically into the inner abutting ends of the hollow axles 25 and 26. It bridges the joint between said inner ends and in effect constitutes a coupling for the auger members. It is all important to note that the auger blades are provided with scraper wires or rods 30 on their peripheral edge portions. These wires sweep in contact with the inner surface of the tubular housing and serve as scavengers and guard against clogging, always insuring proper forcing of the sand through the discharge ports in the housing. At its outer opposite ends the housing is provided with relatively large discharge openings 31 which are in effect overflow apertures. All sand finding and crowding its way to the ends of the housing is ejected through these apertures 31.

In practice, suitable brace means comprising a plate 32 and a brace rod 33 is employed on the frontal portion of the hopper, this arrangement serving to support a tubular coupling 34 telescopically receiving an adjusting rod 35 held in place by a set-screw 36. The rod terminates in an eye engageable with a fixed coupling member 37 on the truck A.

In operation it is obvious that the gravitating sand from the chute enters the hopper 9. It flows down from the hopper into the distributing branches 14 and 15 where the auger units serve to accomplish the desired feeding and distributing action when the valve means is open. Being of utmost simplicity it is thought that this disclosure and description will suffice for comprehensive interpretation of the construction, operation and advantages.

By way of conclusion, it is to be pointed out that the description and drawings have been devoted to a consideration of the invention as a road sander. Persons familiar with road work however, realize that a great deal of stabilizing is being done by state highway departments. This work is being done during the summer months and is accomplished by either spreading salt or chloride on the road bed and then working it in and mixing it with the proper amount of clay. This machine will also be used for spreading salt on gravel highways to thaw ice. We have found that a very small deposit of salt placed on the crown of an icy gravel road will immediately begin its work of removing the ice, and then the salt brine, as it runs toward the ditches, will soon clean up the rest of the road. In fact, the device is usable for handling, spreading and distributing any granular and seed-like material.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

We claim:

1. In a road sander of the class described, a trailer comprising an open bottom centrally located hopper adapted for reception of sand from a dump truck, a pair of duplicate open-ended tubular sand-receiving and distributing branches connected to and projecting in opposite directions from the open sand discharge bottom of said hopper, said branches being in longitudinal alignment with each other, bearing units plugged into the opposite outer ends of said tubular branches, bearing retaining caps mounted on and closing said outer ends, independent companion augers, one mounted in each tubular branch, said augers having hollow hub-axles mounted for rotation in said bearings, spiral blades mounted on said axles, longitudinal circumferentially spaced scraper rods attached to the extreme outer peripheral edges of the spiral blades of the respective augers and disposed in wiping contact with the internal surfaces of said tubular branches, the bottom portions of said tubular branches being apertured, adjustable valve means cooperable with the apertured branches, ground engaging and supporting wheels, said wheels having stub axles, said stub axles projecting into the opposite ends of said hollow hub-axles and being fixedly connected thereto.

2. A road sander of the class described comprising a mobile frame characterized by a horizontally disposed open-ended sand receiving and distributing tube, said tube being provided in its top intermediate its ends with a sand intake opening and provided adjacent its opposite ends with surplus sand evacuating openings, a sand receiving and tube charging hopper connected with said intake opening, the under side of said tube being provided with spaced apertures defining sand distributing orifices, a manually regulated valve mounted on the apertured bottom of said tube for controlling the sand discharged through said orifices, ground engaging and supporting wheels for said frame connected to the outer end portions of said tube, bladed sand conveyor means mounted for rotation in said tube and operatively connected with said ground engaging wheels, and sand scraping and stirring wires attached to the extreme outer peripheral portions of said conveyor blades, said wires being in constant wiping revolvable contact with the inner surface of the tube, whereby to aid in agitating the sand and forcibly ejecting the same through said orifices.

3. In a road sander construction of the class described, a pair of opposed ground engaging wheels, a pair of longitudinally aligned hollow axles secured in driving connection with the hub portions of said wheels, the inner ends of said hollow axles being disposed in end-to-end abutting relation, an assembling and stabilizing rod fitted telescopically into the adjacent abutting ends of said axles, a spiral conveyor blade formed integral with each axle, circumferentially spaced longitudinally extending scraper wires secured to the extreme outer peripheral edges of said spiral blades in parallelism with said axles, and a tubular casing surrounding and enclosing the axles, blades and wires and provided with a sand delivery hopper and valved discharge orifices, said scraper wires being in constant wiping contact with the interior of the casing to expedite forcing the sand from the casing onto the road surface to be sanded.

4. As a component part of an assemblage of the class described, a twin auger assembly comprising a pair of longitudinally aligned independent tubular hub-axles, the inner adjacent

ends of said hub-axles abutting each other, a spiral auger blade mounted on each hub-axle, circumferentially spaced longitudinally extending scraper wires attached to the extreme outer peripheral edges of the respective blades, wheel accommodating stub-axles telescoping into the outer ends of said hub-axles and rigidly connected thereto, and a coupling rod fitting telescopically into the adjacent abutting inner ends of said hub-axles and serving to assemble the same and to allow said augers to turn together in unison or independently at varying speeds of rotation.

FRED S. BEACH.
FITCH H. BEACH.