Oct. 18, 1949. F. L. DOUD ET AL 2,484,985

ROAD SANDING MECHANISM FOR AUTOMOBILES

Filed Jan. 21, 1948 2 Sheets-Sheet 1

Fig. 1

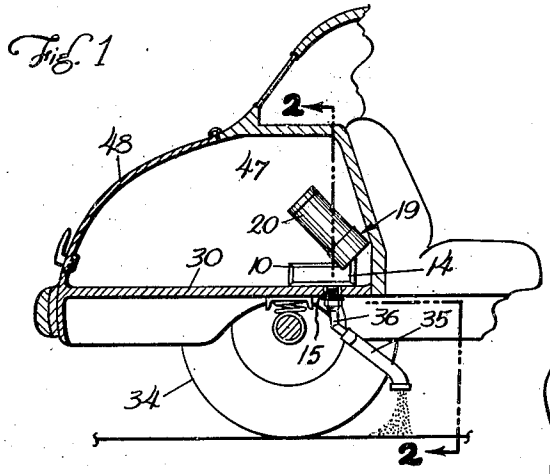
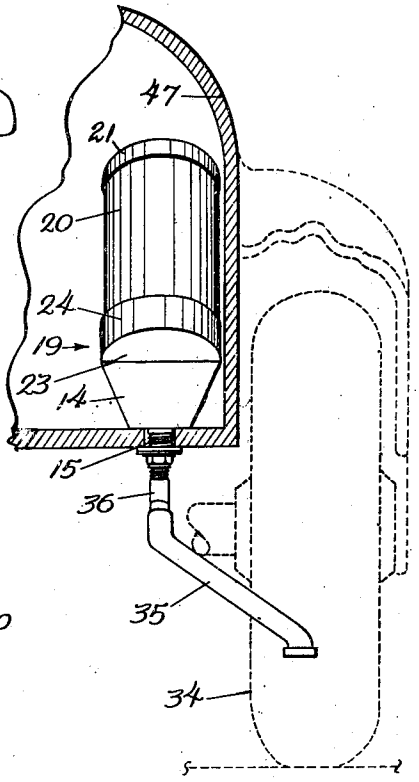


Fig. 2



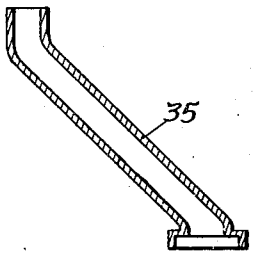


Fig. 3

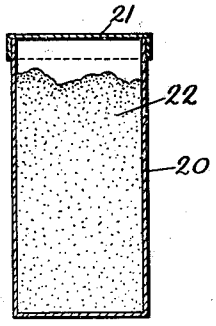


Fig. 4

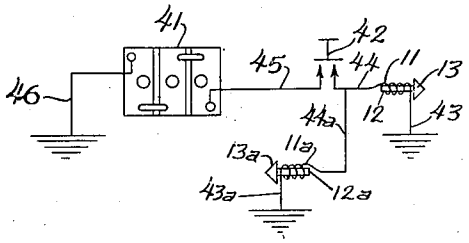


Fig. 5

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ROAD SANDING MECHANISM FOR AUTOMOBILES

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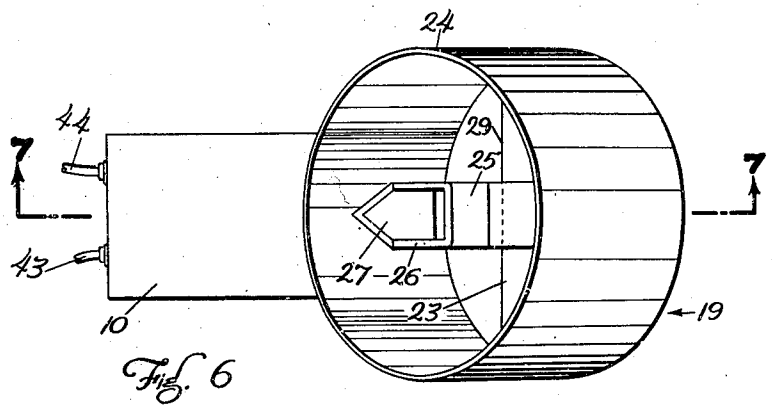


Fig. 6

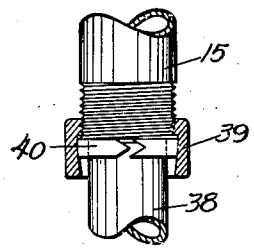


Fig. 8

Fig. 7

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ROAD SANDING MECHANISM FOR AUTOMOBILES

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9 Claims. (Cl. 291—25)

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This invention relates to road sanding mechanism adapted to be carried by an automotive vehicle to facilitate the economical distribution of sand in the path of the vehicle traction wheels when sand is needed to prevent slipping of the wheels or skidding of the vehicle, and particularly to novel and unusually compact mechanism of the class described adapted to be carried in the luggage compartments of automobiles of common design.

It is an object of our invention to provide novel mechanism of the class described which is adapted to be mounted and serviced in the restricted space available in automobiles of modern design.

A further and particular object of our invention is to provide improved mechanism adapted to receive and dispense sand from compact cartons or other packages of nominal cost which are carried in the vehicle storage compartment whereby the replenishment of the sand in the dispending mechanism is greatly facilitated and handling and spilling of sand is minimized.

Our invention also includes other novel features of construction which will be pointed out in the following specification and claims.

Referring to the accompanying drawings which illustrate by way of example and not for the purpose of limitation a preferred embodiment of our invention:

Figure 1 is a fragmentary, longitudinal sectional view through the storage compartment of an automobile and showing one of our sanding mechanisms in side elevation in the storage compartment;

Fig. 2 is a fragmentary cross sectional view through the vehicle, taken approximately on the line 2—2 of Fig. 1, and showing our sanding mechanism in front elevation;

Fig. 3 is a central longitudinal sectional view through one of the discharge pipe members of our mechanism;

Fig. 4 is a central longitudinal section through one of the cartons or packages from which the sand is fed directly into the dispensing mechanism;

Fig. 5 is a wiring diagram illustrating a suitable circuit and switch for controlling the solenoid valves of our mechanism;

Fig. 6 is a detailed plan view of the casing and holder with the carton of sand removed;

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Fig. 7 is a part central vertical section and part side elevational view of the principal parts of our mechanism and showing a fragmentary portion of one of the sand cartons in operative relation to the holder, and

Fig. 8 is a detail, part sectional view, showing suitable fittings for connecting a discharge pipe to the outlet nipple of our apparatus.

As best shown in Figs. 6 and 7, we provide a horizontally extending, substantially rectangular casing 10 containing a solenoid 11 having a plunger 12 upon one end of which is mounted a conical valve head 13 for controlling the passage of sand from a receptacle 14 to a discharge nipple 15. A circular orifice is formed in a wall 16 to afford a seat for the valve head 13. This head is normally held in closed position on its seat by a spring 17 which is confined between the valve head 13 and the solenoid coil. An annular, flexible member 18 encloses the spring 17 to prevent access of the sand to the spring and bearing for the plunger 12.

Rigidly fastened to the receptacle 14 is a holder indicated generally by the numeral 19 for a carton 20 constituting the sand reservoir from which the sand is fed into the receptacle 14. The carton 20 is preferably of cylindrical shape and constructed from heavy paper, cardboard or other inexpensive thin sheet material. As indicated in Fig. 4, the carton 20 may be provided with a flanged, removable cover 21 which, after the carton has been filled with sand 22, may be closed and sealed to prevent the access of moisture to the sand contained therein. The carton 20 is adapted to be inserted in the holder 19 and, as best shown in Fig. 7, the holder has an inclined bottom wall 23 and a cylindrical wall 24 adapted to fit the exterior of the carton 20 so that the latter is normally held in an inclined position.

Projecting inward from the bottom wall 23 of the holder 19 is a cutting device comprising a plate 25 fixed on and projecting at right angles to the wall 23, parallel side flanges 26 integral with the plate 25 and a blade 27 extending in parallel relation to the plate 25 and integral with the flanges 26, all adapted to penetrate the carton 20 and to form a tubular discharge spout projecting into the carton. The blade 27 has a pointed and sharpened edge which extends in continuation of sharp inner edges on the flanges 26 so that a rectangular opening is cut in the carton 20 and a

flap 28 of the carton material, substantially equal to the area of the opening in the carton, is folded back and held in open position adjacent to the sand passage formed by the plate 25, flanges 26 and blade 27. A recess 23*a* is formed in the bottom of the holder 19 to permit a small amount of sand to remain in the holder without interfering with the insertion of a full carton of sand when required. The recess 23*a* is formed by an offset portion 23*b* of the bottom wall 23 and the sand passes through an opening 29 extending across the wall portion 23*a* in entering the receptacle 14. The lower edge of the blade 27 and edges 26*a* of the flanges 26 are spaced from the bottom wall 23 to permit sand to flow freely to the opening 29 from the bottom corner of a sand container or carton 20 in place in the holder.

Our housing 10 and receptacle 14 are adapted to rest on the vehicle floor 30 in any convenient position where an opening 31 for the downwardly projecting nipple 15 may be cut in the floor. This nipple is preferably threaded and provided with a large nut 32 and a gasket 33 adapted to engage the outer surface of the floor 30 for securing our apparatus on the vehicle. A sand discharge pipe extends downward and laterally from the nipple 15 to deliver a stream of sand to a suitable place in front of and closely adjacent to one of the traction wheels 34 of the vehicle. The discharge pipe preferably comprises a flexible lower end member 35 (Figs. 2 and 3) and suitable fittings connecting the upper end of this member to the nipple 15. For example, an elbow 36 may be interposed between the upper end of the flexible member 35 and nipple 15 and connected to the latter by means of threads and a lock nut 37 or, as shown in Fig. 8, a straight pipe fitting 38 may be connected to the lower end of the nipple 15 by means of a nut 39 having a tapered bore containing a split ring 40 which is caused to grip the fitting 38 when the nut 39 is turned upward on the nipple 15. By selection of suitable fittings and discharge members 35 of suitable lengths and shapes, the discharge pipe may be disposed to pass obstructions and to deliver the sand to the proper place in relation to traction wheels of substantially any of the conventional models of automobiles in present use.

We provide a duplicate of the above-described sanding mechanism at each side of the vehicle so that the road directly in the path of each of the traction wheels may be sanded when road conditions are such that sanding is required. In the wiring diagram (Fig. 5) the respective solenoid coils are indicated by the numerals 11 and 11*a*, the solenoid plungers by the numerals 12 and 12*a* and the valve heads by the numerals 13 and 13*a*. Current for energizing the solenoid coils may be supplied from the vehicle battery 41, under control of a normally open switch 42, preferably mounted within convenient reach of the vehicle operator or driver. The battery 41, switch 42 and solenoid coil 11 are included in a circuit which may comprise conductors 43, 44, 45 and 46 and the duplicate solenoid coil 11*a* may be included in a branch circuit comprising conductors 43*a* and 44*a*. One terminal of each of the conductors 43, 43*a* and 46 may be grounded on the vehicle frame, as indicated.

As indicated in Figs. 1 and 2, the mechanism comprising the casing 10, receptacle 14, holder 19 and carton 20 and contents is adapted to be carried in the restricted space ordinarily available in the luggage compartment 47 of an automobile of common type. This luggage compartment has a door 48 and extends adjacent to the rear or traction wheels of the vehicle.

To charge our apparatus with sand, a carton 20 of any suitable size, containing a supply of sand, is merely thrust into the holder 19 with sufficient force to cause the cutting blade 27 and sharp flanges 26 to penetrate the end wall of the carton and to form an opening therein as these cutting members and plate 25 enter the carton. This turns the flap 28 of carton material back and allows sand to pass freely through the opening 29 into the receptacle 14 as long as any sand remains in the carton and when the level of sand in the receptacle 14 is low enough to permit the flow from the carton. The carton is held in place by engagement with the cylindrical wall 24 with the exterior of the carton and by the blade 27 which engages the interior surface of the carton side wall.

To distribute sand in front of the wheels 34, the switch 42 is merely closed. This causes the solenoid coils 11 and 11*a* to be energized and the valve heads 13 and 13*a* to be moved to open position against the spring bias. Thereupon sand flows from the receptacle 14 through the nipple 15 and fittings connecting its lower end to the flexible discharge pipe member 35. The flow of sand continues as long as the switch 42 remains closed. When the switch is released to open position the solenoids allow the valve heads to be moved to closed position by the actuating springs.

Our apparatus is readily rotatable about the axis of the discharge nipple 15. This facilitates the fitting of the apparatus into the available restricted space in any particular vehicle and our invention is also made unusually adaptable for use in peculiarly restricted space by reason of the compactness of our sand receptacle, valve and sand reservoir and whereby the reservoir is supported in inclined position and cartons of various sizes and heights may be inserted in the holder therefor in position to feed the contents into the base receptacle.

By supplying coarse sand or other freely-flowing dry, gritty material in cartons or other containers of extremely low cost and adapting the dispensing apparatus to perforate and hold the cartons or containers, we make it feasible to locate the dispensing apparatus in the otherwise inaccessible and extremely restricted space available in the vehicles in general use and we make it unnecessary to handle the sand in bulk for the charging and refilling of the apparatus with sand. A number of suitably compact cartons of sand may be carried in the luggage compartment where they are instantly available for use. It will also be evident that our invention minimizes the effort required to charge and refill the apparatus and eliminates all danger of spilling sand, while facilitating storage of the sand in sealed containers which keep it dry and, therefore, in uniformly fluid condition irrespective of the precipitation or icing conditions which usually prevail when road sanding is needed most.

Having described our invention, what we claim as new and desire to protect by Letters Patent is:

1. In road sanding mechanism, a receptacle for sand adapted to be mounted on a vehicle having a traction wheel, a discharge pipe adapted to extend from said receptacle to a place in front of said wheel, a holder for a container of sand extending above said receptacle, said holder having an inclined bottom wall formed with a bottom

opening communicating with said receptacle, a tubular member projecting from said holder adjacent to said opening, a container for sand constructed from thin sheet material, adapted to be supported in said holder and having a bottom wall adapted to be penetrated by said tubular member to afford a passage for the flow of sand from said container into said receptacle and a valve for controlling the flow of sand from said receptacle through said pipe.

2. In road sanding mechanism, a receptacle for sand adapted to be mounted on a vehicle having a traction wheel, a discharge pipe adapted to extend from said receptacle to a place in front of said wheel, a holder for a container of sand extending above said receptacle, said holder having a bottom wall formed with an opening communicating with said receptacle, a rigid blade projecting from said holder adjacent to said opening, a container for sand constructed from fibrous sheet material, adapted to be supported in said holder and having a bottom wall adapted to be penetrated by said blade to afford a passage for the flow of sand from said container into said receptacle and a valve for controlling the flow of sand from said receptacle through said pipe.

3. In road sanding mechanism, a receptacle for sand adapted to be mounted on a vehicle having a traction wheel, a discharge pipe adapted to extend from said receptacle to a place in front of said wheel, a holder for a sand container carried by said receptacle, said holder having a bottom wall formed with an opening in communication with said receptacle, a cutting member projecting from said holder adjacent to said opening, a container for sand adapted to be supported in said holder and having a wall adapted to be penetrated by said cutting member to afford a passage for the flow of sand from said container into said receptacle and a valve for controlling the flow of sand from said receptacle through said pipe.

4. In road sanding mechanism, a receptacle for sand adapted to be carried on a vehicle having a traction wheel, a discharge pipe adapted to extend from said receptacle to a place in front of said wheel, a holder for a sand container carried by said receptacle, said holder having an inclined bottom wall formed with an opening near its lower edge communicating with said receptacle and having an inclined side wall disposed substantially perpendicularly to said bottom wall, a cutting member projecting from said holder adjacent to said opening, a container for sand adapted to be supported in inclined position in said holder and having a wall adapted to be penetrated by said cutting member to afford a passage for the flow of sand from said container into said receptacle and a valve for controlling the flow of sand from said receptacle through said pipe.

5. In road sanding mechanism for an automobile having a storage compartment extending adjacent to a wheel, a receptacle for sand adapted to be mounted in said compartment, a discharge pipe adapted to extend from said receptacle to a place in front of said wheel, a holder for a sand container connected to said receptacle, said holder having a bottom opening in communication with said receptacle, a cutting member projecting from said holder adjacent to said opening, a sand container adapted to be supported in said holder and having a wall adapted to be penetrated by said cutting member to afford a passage for the flow of sand from said container into said receptacle and a valve for controlling the flow of sand from said receptacle through said pipe.

6. In road sanding mechanism for an automobile having a storage compartment extending adjacent to a wheel, a receptacle for sand adapted to be mounted in said compartment, a discharge pipe adapted to extend from said receptacle through an opening in the floor of said compartment to a place in front of said wheel, a holder for a sand carton carried by said receptacle, said holder having a bottom opening in communication with said receptacle, a tubular cutting member projecting from said holder adjacent to said opening, a carton for sand constructed from fibrous sheet material, adapted to be supported in inclined position in said holder and having a bottom wall adapted to be pentrated by said cutting member to afford a passage for the flow of sand into said receptacle, a valve for controlling the flow of sand from said receptacle to said pipe, a solenoid for operating said valve and an electric switch for closing a circuit through the coil of the solenoid to open said valve.

7. In road sanding mechanism of the class described, a sand container having closed end walls and side walls, a holder having an open top adapted to receive the normally lower end portion of said container and having side walls adapted to embrace the side walls of said container, said holder having a bottom wall member formed with a sand discharge opening, means for spacing the lower end wall of said container upward from said bottom wall member within said holder to afford a recess for sand below the container bottom wall within the holder and permitting the substitution of one sand container for another in said holder without removal of the sand from said recess, said container having an opening for the flow of sand from the container into said holder recess and valve controlled means for discharging sand by gravity from said holder.

8. In road sanding mechanism of the class described, a sand container having closed end walls and side walls, a holder having an open top adapted to receive the normally lower end portion of said container and having side walls adapted to embrace the lower portions of the side walls of said container, said holder having a bottom wall member formed with a discharge opening for sand, means for spacing the closed lower end wall of said container upward from said bottom wall member of said holder and affording a recess for sand below the closed end wall of said container in the holder, cutting means projecting from the holder to penetrate the container and permit the flow of sand from the container into said holder recess, the lower end wall of said container being constructed from sheet material adapted to be penetrated readily by said cutting means and valve controlled means for discharging the sand by gravity from said holder.

9. In road sanding mechanism of the class described, a sand container having closed end walls and side walls, a holder having an open top adapted to receive the normally lower end portion of said container and having inclined side walls adapted to embrace the side walls of said container to support said container in inclined position, said holder having a bottom wall member formed with a sand discharge opening, means for spacing the lower end wall of said container

upward from said bottom wall member of said holder to afford a recess for sand below said container within the holder and permitting the substitution of one sand container for another in said holder without removal of sand from said recess, said container having an opening for the flow of sand from the container into said holder recess and valve controlled means for discharging the sand by gravity from said holder.

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