April 22, 1941. J. M. GLEASON 2,239,518

SANDING DEVICE

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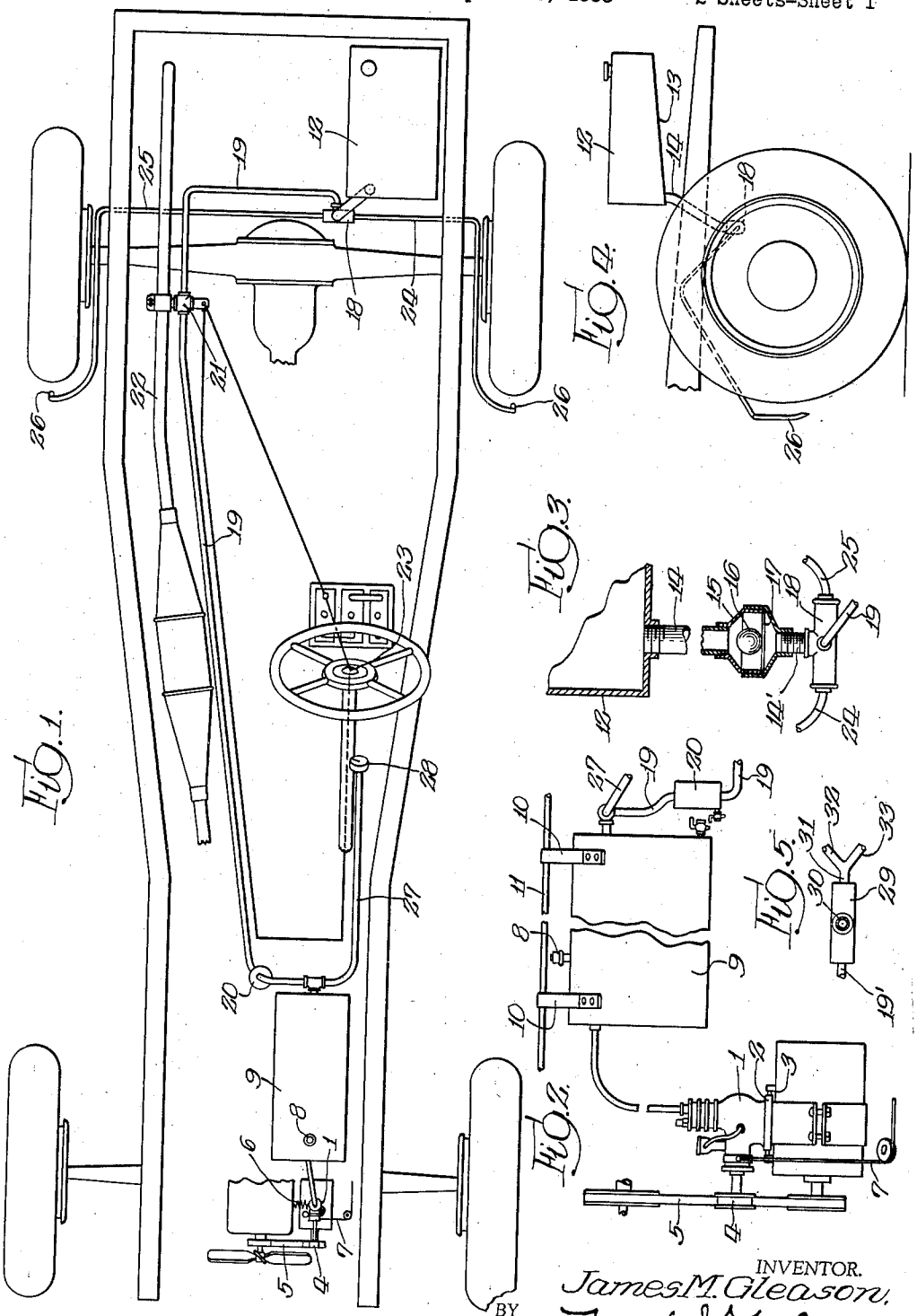


FIG. 1.

FIG. 4.

FIG. 3.

FIG. 5.

FIG. 2.

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Fig. 7.

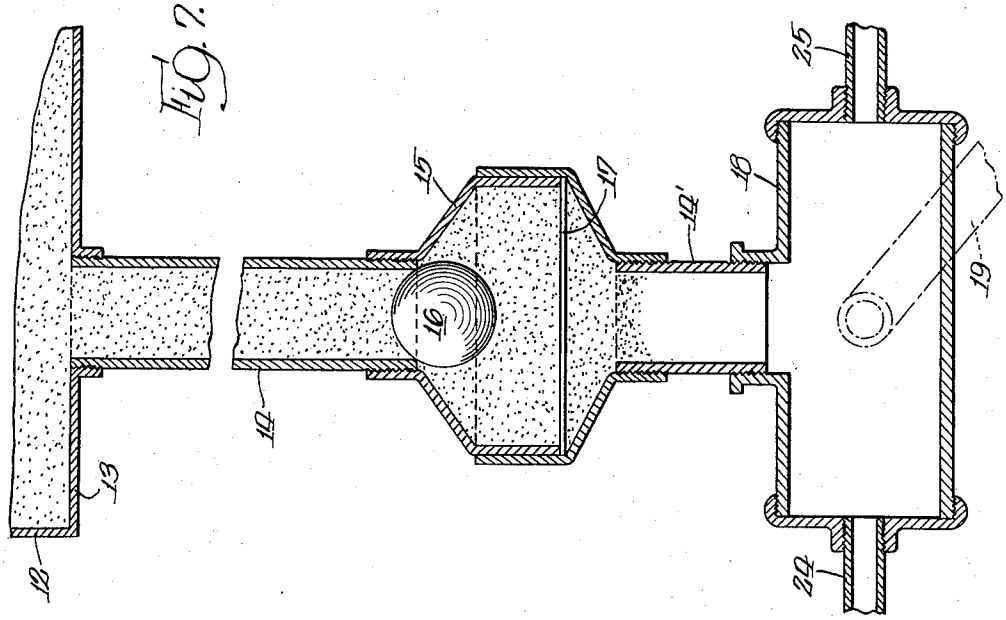


Fig. 6.

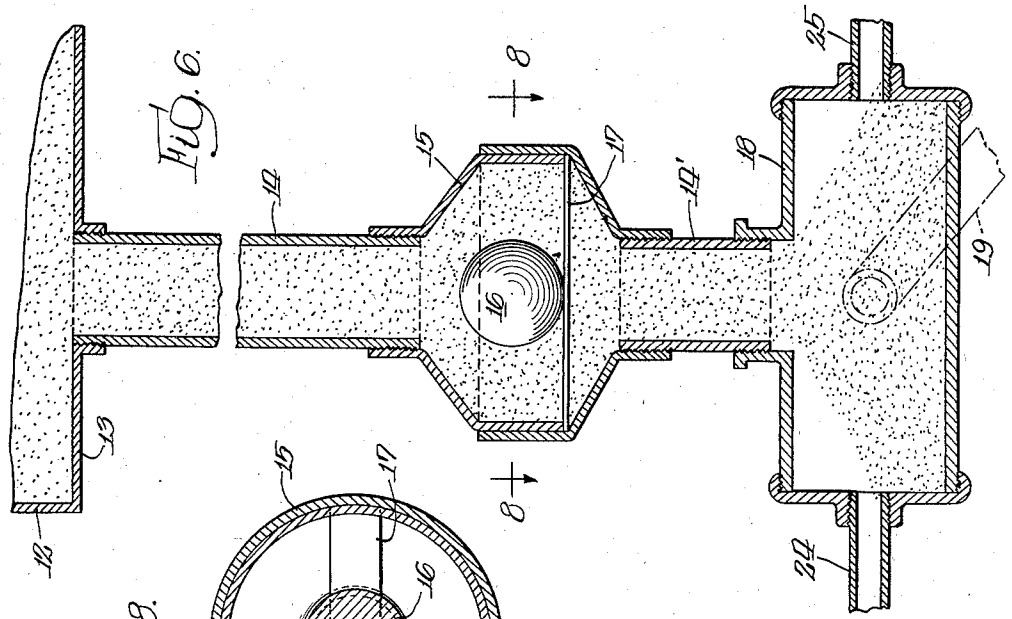
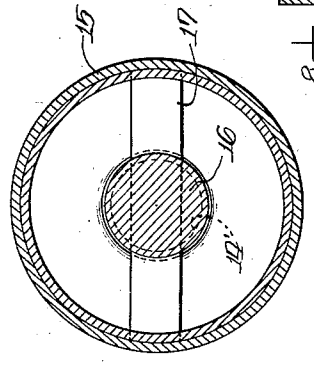


Fig. 8.



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Patented Apr. 22, 1941 2,239,518

UNITED STATES PATENT OFFICE

2,239,518

SANDING DEVICE

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Application April 14, 1938, Serial No. 201,857

7 Claims. (Cl. 291—3)

This invention relates to improvements in sanding devices to be used on automobiles, trucks and buses for feeding sand or other similar gritty material onto the road surface immediately in front of the wheels of the vehicle.

One of the objects of the invention is to provide an improved form of sanding device which employs a blast of air or other gas under pressure to direct forcibly the placement of the sand.

Another object of the invention is to provide a sanding device in which pre-measured quantities of sand are discharged with each operation of the device, that is, with each blast of air or gas.

Another object of the invention is to provide in connection with a sanding device, a compressed air system protected against the troubles resulting from freezing of moisture in the air and avoiding other related troubles resulting from excess moisture.

Another object of the invention is to provide a sanding device so constructed as to prevent the wasting of sand.

Other objects and advantages of the invention, inherently possessed by it, will become apparent from a perusal of the following specification.

In the drawings,

Fig. 1 is a diagrammatic showing of an automotive vehicle equipped with my invention;

Fig. 2 is a detailed view in elevation of certain portions of the invention;

Fig. 3 is another detail, showing the sand regulating valve;

Fig. 4 is a detailed showing of the sand storage box and sand delivery pipes; and

Fig. 5 shows a modified form of sand collecting chamber.

Fig. 6 is a vertical sectional view taken through the middle of a sand collecting chamber and valve structure showing all of the parts at rest between operations of the device.

Fig. 7 is a view at the same position, showing the position of the parts when the air valve is open.

Fig. 8 is a horizontal sectional view on the line 8—8 of Fig. 6.

As compressed air will ordinarily be used as the compressed fluid for delivering the sand, I provide an air pump 1, mounted on a base 2, which is pivoted at 3, so that a pulley 4 may be held resiliently against the fan belt 5 by means of a spring 6. Any suitable mechanism, such as a cable 7, leading to the instrument board of the vehicle may be employed for rotating the pump on its pivoted base away from the fan belt to stop the pump when no air pressure is needed. An air pressure relief valve 8, of ordinary construction, may be mounted on the tank 9 to relieve excess pressure.

The air storage tank 9 may conveniently be hung by straps 10 from the tie rod 11, which normally extends from the radiator back to the motor board. Thus the tank will be suspended above the motor, where it will receive considerable heat, thus preventing freezing of any moisture accumulated in the tank. Likewise, the air pump is mounted in position where moisture in it will not freeze.

A sand storage box 12 will be secured in any appropriate manner to the vehicle near the rear axle and preferably should have an inclined bottom 13, from which a delivery pipe 14 leads to the check valve 15, shown in Fig. 3. This valve will be provided with an enlarged chamber as shown and a ball 16 of rubber or other light resilient material, normally resting upon a diaphragm 17 of perforated construction or narrow dimensions to permit the passage of sand through or past the diaphragm while yet furnishing adequate support for the ball.

A T-shaped member 18 serving as a sand collecting chamber is connected with the outlet of the check valve while a pipe 19 having a moisture separator and trap 20 located therein is connected with the air tank for delivering air into the T 18.

An electrically operated valve 21 will be located adjacent to and preferably attached upon the usual exhaust pipe 22, in order to be heated thereby to prevent the freezing of moisture in the valve. This valve may employ a solenoid which can be operated from a push button switch whose preferred location is indicated at 23 on the steering post.

From opposite ends of the T-shaped member 18 lead the sand discharge pipes 24 and 25. It will be observed that each of these pipes is provided with a vertical portion such as 26 shown in Fig. 4, the lower end of which may be curved slightly toward the wheel and cut on a vertical plane with the open end of the pipe facing to the rear, thus minimizing the danger of entry of mud and other foreign material into the aperture in this pipe.

The device operates as follows:

When the road conditions require the use of sand, the air pump will be placed in contact with the fanbelt by operation of the cable 7 and air will be stored in the tank 9 at whatever pres-

sure is determined by the relief valve 8 or other suitable air pressure controlling mechanism. The sand in the sand box will fall through the pipe 14, past the ball 16, which will normally occupy the position shown in Fig. 3, through the connection 14' filling both the check valve and the chamber 18. When the operator pushes the button 23 momentarily, the valve 21 will release a blast of air into the T 18, causing the sand therein to be discharged under air pressure in front of the two rear wheels simultaneously and in equal amounts. As the air pressure is also exerted upwardly into the check valve, the ball 16 will be lifted against the lower open end of the pipe 14, sealing the same and preventing the discharge of air up into the sand box.

When the air valve is closed upon release of the button, the ball 16 will drop down again and the T 18 will again fill with sand, thus making the apparatus ready for another operation.

By providing a sharp upward bend in each of the pipes 24 and 25, the sand collecting in the T 18 between operations of the apparatus will be prevented from escaping under the action of gravity and vibration. At the same time the downward inclination of the outward end of each of these pipes will make certain that no sand or moisture will remain in the ends of the pipes.

The location of the air valve attached to or otherwise mounted adjacent to the exhaust pipe will assure against freezing of any moisture in the air valve. It is contemplated also that the air valve may be attached to the exhaust pipe at some other location, for example, under the motor hood, or it may be secured to some other heated portion of the vehicle or otherwise mounted so that it will receive a substantial amount of heat to prevent freezing of any moisture which may collect in the valve.

If desired, a pipe 27, leading to an air pressure gauge 28, may be provided to show the operator how much air pressure is being carried in the tank at any time.

A modified form of a sand collecting chamber is shown in Fig. 5. The chamber 29 may be connected to the pipe 14' at the opening 20 in its upper side, while an air supply tube 19' may be connected as shown. Instead of having the sand delivery tubes connected at the opposite ends of this chamber a single tube 31 may be connected at one end with Y branches 32 and 33, connected to the sand delivery tubes, thus assuring a delivery in equal amounts of sand to the wheels.

The amount of sand discharged with each blast of air will, of course, be determined by the amount of sand retained in the collecting chamber and in the bottom portion of the check valve. Hence the amount of sand may be varied by varying the size of these connections or the chamber, in particular. As each blast of air is admitted to the sand collecting chamber, the sand underneath the ball will raise the latter against the lower end of the pipe 14, sealing the same to prevent escape of air into the sand box, as illustrated in Fig. 7 yet at the same time occasioning some agitation of the column of sand leading up into the sand box. This agitation will be helpful in assuring a subsequent free flow of sand from the sand box. The quantity of sand discharged at each operation of the air valve should be so limited as to provide only an adequate amount of sand in front of each wheel without any excess spilling of sand onto the roadway. When the air valve is closed, the check valve will operate rapidly, permitting the collecting chamber to fill almost instantly, as illustrated in Fig. 6. Hence the operation of refilling and discharging of the sand may be repeated with great rapidity when occasions demand it.

This device has been found to have the great merit of delivering sand without failure whenever desired and in small measured quantities which may be supplied as frequently as the operator desires but without any wastage of sand.

It should be understood that the construction herein shown while at present preferred, may be subject to some modification without departing from the spirit and scope of the invention defined in the appended claims.

Having shown and described my invention, I claim:

1. A sanding device for a vehicle comprising a sand box shaped to provide gravity feed to a bottom outlet, an outlet conduit connected with the bottom of said box having a normally open and upwardly closing check valve located therein and closable by gas-pressure, a horizontally elongated chamber centrally connected at its top side with the bottom of said conduit for receiving and retaining sand therefrom, sand delivery tubes connected with opposite ends of said chamber and leading to discharge positions in front of the driving wheels of the vehicle, said tubes being bowed upwardly between the chamber and their discharge ends to prevent gravity discharge of sand and valve controlled means for delivering a gas under pressure into said chamber arranged to act directly on said check valve to close the same and to blast the sand therefrom through said tubes.

2. A sanding device for a vehicle comprising a sand box shaped to provide gravity feed to a bottom outlet, an outlet conduit connected with the bottom of said box having a normally open and upwardly closing check valve located therein, a horizontally elongated chamber centrally connected at its top side with the bottom of said conduit for receiving sand therefrom and for retaining sand between successive discharge operations of the device, sand delivery tubes connected with opposite ends of said chamber and leading to discharge positions in front of the driving wheels of the vehicle, said tubes being bowed upwardly between the chamber and their discharge ends to prevent gravity discharge of sand and valve controlled means for delivering a gas under pressure into said chamber arranged to close said check valve and to blast the sand therefrom through said tubes, said check valve being constructed to be closed by gas pressure in the chamber to prevent discharge of sand from the box during the existence of a substantial gas pressure in said chamber.

3. A sanding device for a vehicle comprising a sand box shaped to provide gravity feed to a bottom outlet, an outlet conduit connected with the bottom of said box having a normally open and upwardly closing check valve located therein, a chamber connected with the bottom of said conduit, sand delivery tubes upwardly arched between the ends leading from said chamber to discharge positions in front of the driving wheels of the vehicle, and valve controlled means for delivering a gas under pressure into said chamber arranged to close said check valve and blow all of the sand from the chamber outwardly through said tubes, said chamber being elongated horizontally with said conduit leading into its middle portion from the top thereof, said air

delivery means being connected to the middle portion of said chamber.

4. A sanding device for a vehicle comprising a sand box shaped to provide gravity feed to a bottom outlet, an outlet conduit connected with the bottom of said box having a normally open and upwardly closing check valve located therein, a chamber connected with the bottom of said conduit so arranged that the gravity feed will place a column of sand below said valve leading into said chamber, sand delivery tubes upwardly arched between their ends leading from said chamber to discharge positions in front of each of the two driving wheels of the vehicle, and valve controlled means for delivering a gas under pressure into said chamber arranged to close said check valve and seat it by acting on said column to raise the valve and to simultaneously blow all of the sand from the chamber outwardly through said tubes, said chamber, gas delivery means and sand tubes being so constructed and arranged that sand and air are expelled in substantially equal quantities simultaneously from the two tubes.

5. A sanding device for a vehicle comprising a sand storage box, conduit means connected to said box in position to receive sand therefrom for conducting and distributing sand to positions in front of a plurality of the vehicle wheels, said means being further constructed and arranged to retain a quantity of sand without tendency to spill the same between successive discharge operations of the device, a check valve interposed in said conduit means between said box and said retained quantity of sand normally open to permit a flow of sand from the box past the valve and closable by gas pressure exerted on the sand below the valve to thereby lift the sand against the valve to seat it, and means for injecting controlled quantities of compressed gas into said conduit means beyond the discharge side of said check valve for closing the latter and blowing all of said retained sand from said conduit means.

6. In a vehicle sanding device, a sand supply container, a sand collecting chamber and means connecting the same with said container for delivering sand to the chamber, a normally open check valve associated with said means arranged when open to admit sand to said chamber and when closed to stop the flow of sand to the chamber and to retain the body of sand in the chamber extending up into said connecting means under and past the valve when the latter is open, a conduit connected with said chamber arranged for delivering sand to a position in front of a wheel of the vehicle, said chamber and conduit being constructed and arranged to prevent gravity from discharging the sand from the chamber through the conduit, and means for supplying a blast of compressed air to the chamber interior to lift the sand in the connecting means beneath said valve, pushing the valve upwardly to thereby close said check valve and simultaneously to blow the sand from the chamber and conduit thereby emptying the chamber.

7. In a vehicle sanding device a sand supply container, a sand collecting chamber and means connecting the container and chamber, a normally open freely movable ball check valve positioned in said means arranged when open to permit the flow of sand past the ball to the chamber and to retain a column of sand extending from the chamber upwardly underneath and past the ball in said connecting means, a conduit connected with said chamber for delivering sand to a vehicle wheel, said chamber and conduit being constructed and arranged to prevent gravity discharge of sand to the vehicle wheel, and means for supplying a blast of compressed air to the chamber interior to lift the column of sand under the ball to raise the latter and to thereby close said check valve and simultaneously to blow all of the sand from the chamber and conduit, while holding the valve closed.

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