

Sept. 13, 1932.

A. T. COWAN

1,877,475

SANDING APPARATUS

Filed Oct. 6, 1931

3 Sheets-Sheet 1

Fig. 1.

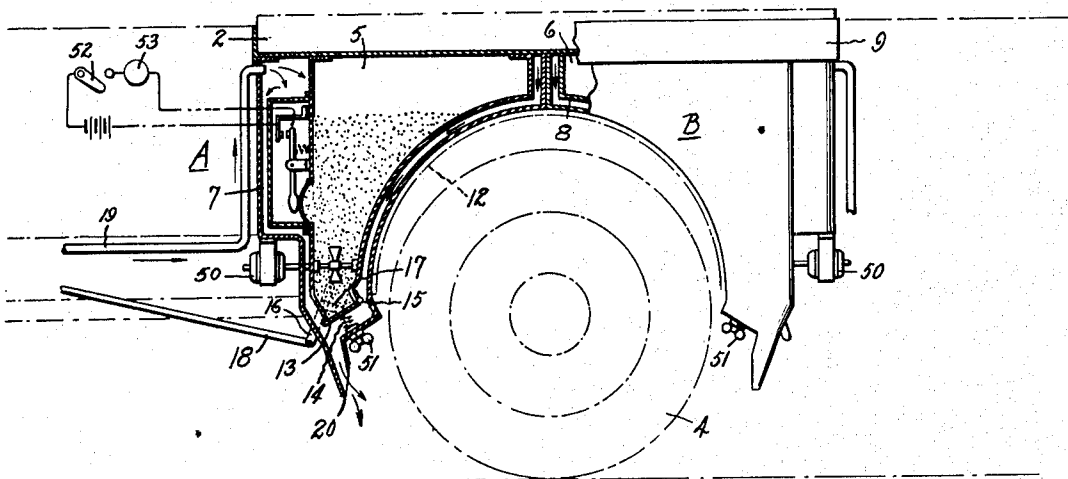
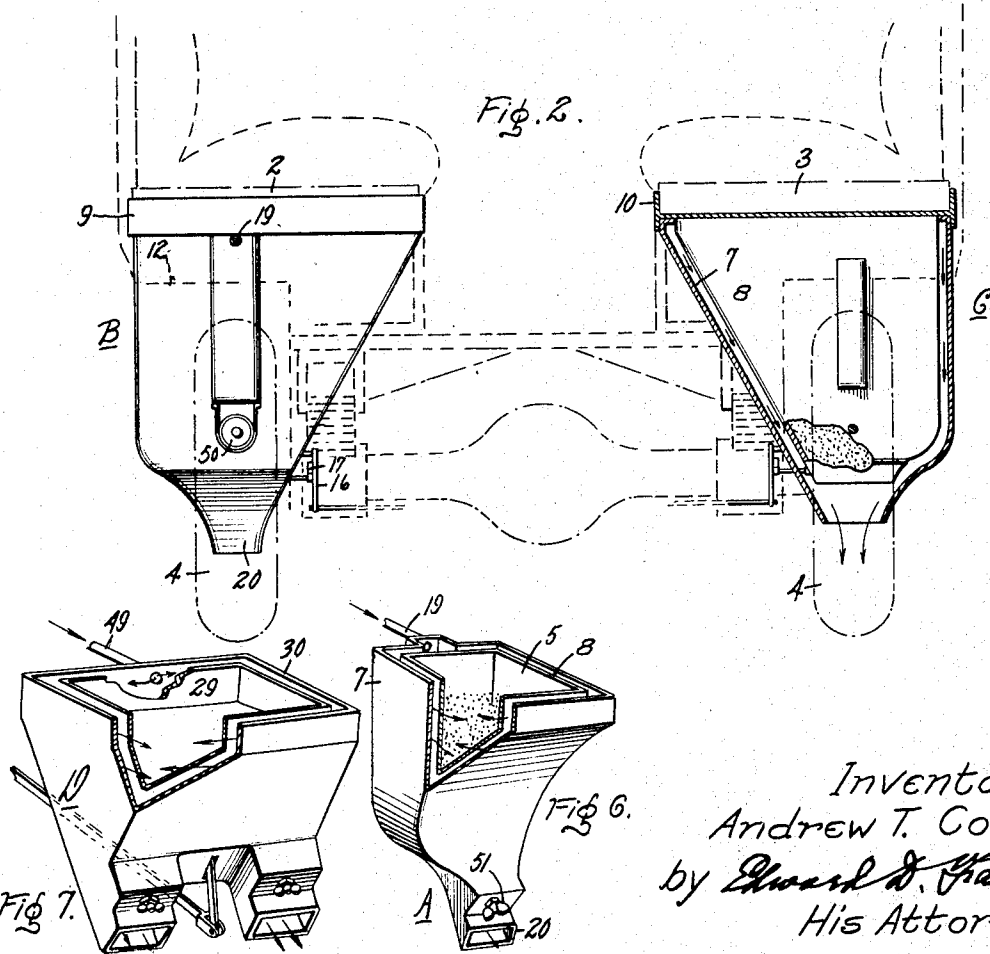
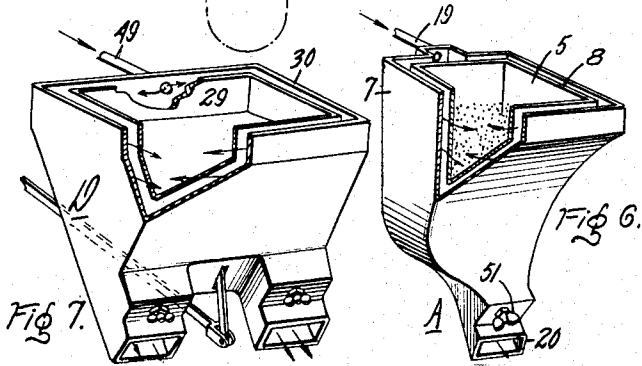


Fig. 2.



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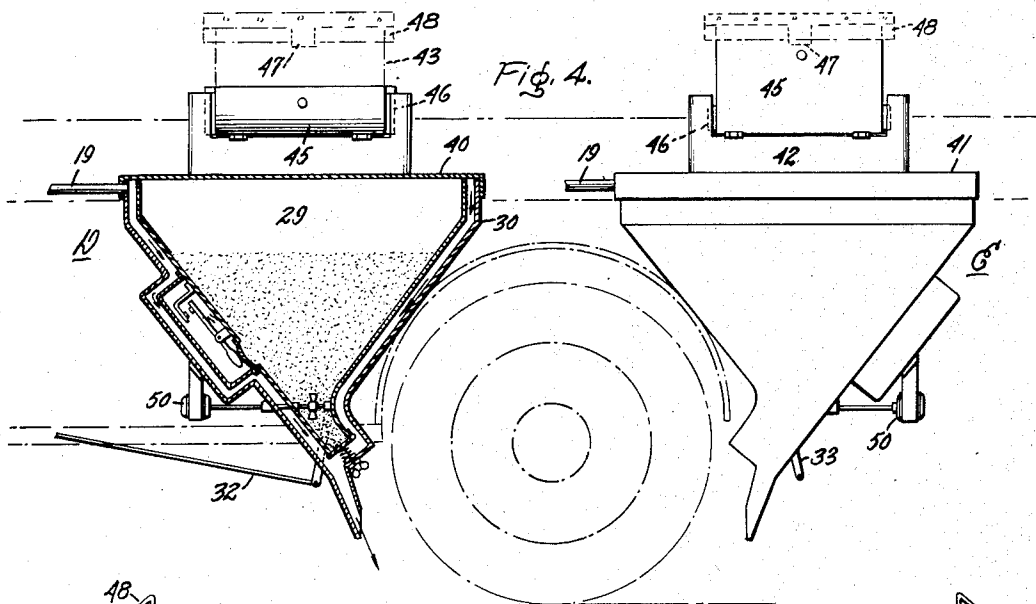
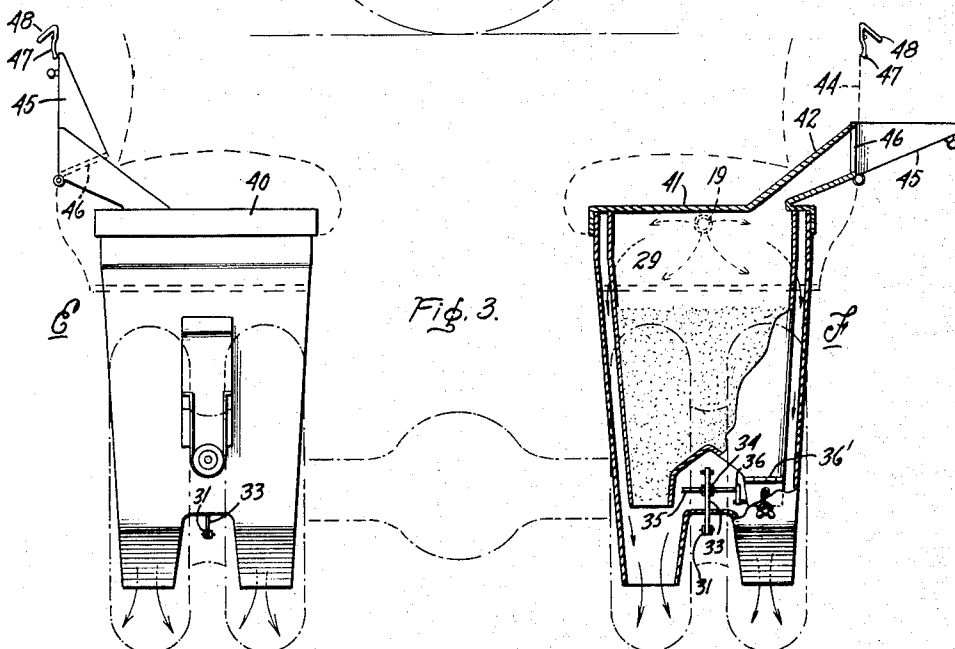
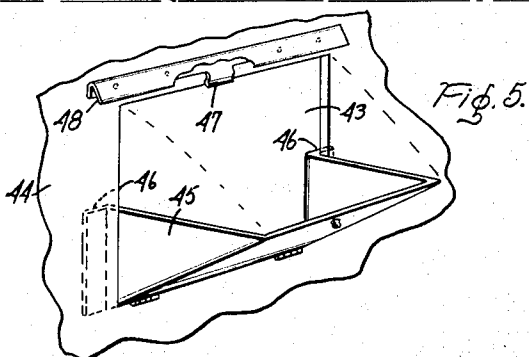
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3 Sheets-Sheet 2



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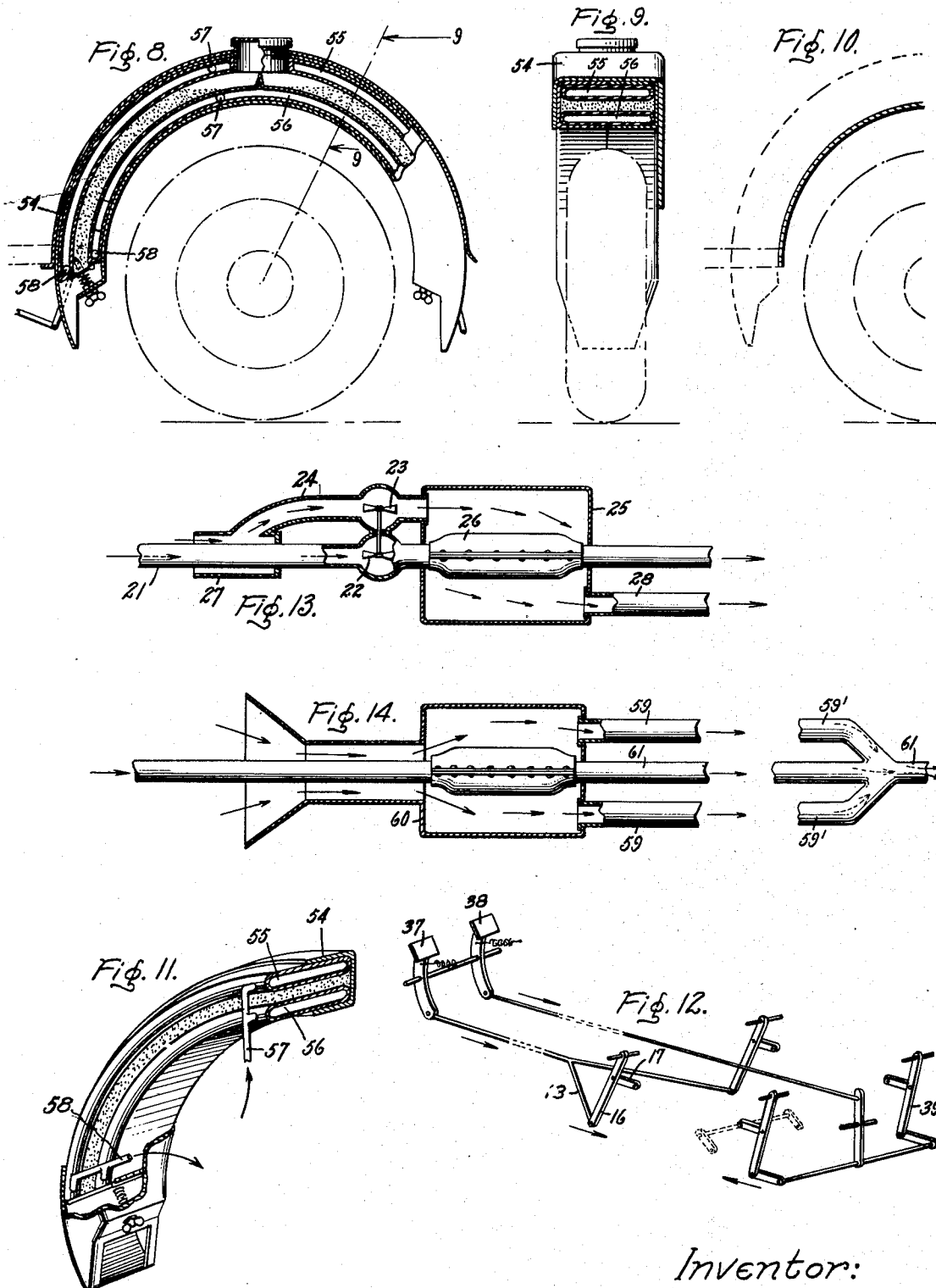
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SANDING APPARATUS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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SANDING APPARATUS

Application filed October 6, 1931. Serial No. 567,161.

My invention relates to road sanding apparatus and more in particular to sanding apparatus especially adapted for use in connection with vehicles, such as trucks, automobiles and the like, to prevent their skidding on slippery or icy roads.

It is an object of my invention to provide receptacles suitably located on the vehicle to serve as containers from which sand may be led to points near the wheels of the vehicle where suitable valves are located to control the outflow of sand and to provide means for maintaining the sand warm and dry. It is also an object to provide other features as will more fully appear herein.

For the purposes of this specification I have prepared drawings as a part thereof, in which I have shown specific devices embodying the features of my invention. It will be understood, however, that I do not wish to be limited to the specific forms shown, inasmuch as the features of the invention pointed out by the claims herein may be embodied in other forms.

Referring to the drawings:—

Fig. 1 shows, in side view, the rear portion of a vehicle, partly in section.

Fig. 2 is a rear view of the same vehicle, partly in section showing the form of apparatus of Fig. 1 and showing the two rearmost sand containers, one on each side.

Fig. 3 is a rear view, partly in section showing another form of the apparatus of the invention as applied to a double rear-wheel vehicle, as used for example in buses or trucks and showing the two rearmost sand containers of this form of apparatus. In this figure means in the form of a chute is indicated, by way of which sand may be poured into the containers from the outside of the vehicle.

Fig. 4 is a side view of the same vehicle, Fig. 3, showing the back and the forward containers of one of the rear wheels and showing also chutes for conveying the sand into the containers from the outside of the vehicle.

Fig. 5 shows a view in perspective of the chute of Figs. 3 and 4.

Fig. 6 is a view, in perspective and partly

broken away, of the forward container of the rear wheel of Fig. 1.

Fig. 7 is a similar view of the forward container of Fig. 4.

Fig. 8 is a side view partly in section of another form of sand container which takes the form of a fender.

Fig. 9 is a section taken along line 9—9 Fig. 8.

Fig. 10 is a side view showing the container of Fig. 11 located over the fender.

Fig. 11 is a view in perspective of one section of a container shaped like that of Fig. 8 and of similar construction.

Fig. 12 is a diagrammatic perspective view of the control levers for the valves shown in Figs. 1, 2, 3, 4, 6 and 7.

Fig. 13 shows means, partly in section for heating the containers. This view is more or less diagrammatic.

Fig. 14 is another form of the same means.

Referring more in detail to the drawings, in Fig. 1 I have indicated, on both sides of the bus side seats 2 and 3 which extend over the rear wheels 4. Also on both sides of the bus I provide suitable containers for sand. For example on the left side as viewed from the rear of the vehicle I provide two containers 5 and 6. These containers are provided with jackets 7 and 8 and with spacings behind the jackets through which hot air may circulate as indicated by the arrows in Figs. 1, 2, and 6. The covering for these containers serves as a holder for the seat 2. Likewise the cover 10 for the similar containers on the opposite side serves as a holder for seat 11. Each container and its jacket is constructed to form a sand unit, see for example unit A Fig. 6, units A and B Fig. 1 and units B and C Fig. 2. These units are formed so that they may rest on the fenders, as the units A and B are shown to rest in Fig. 1. Each of these containers is provided with a valve at the lower end for controlling the flow of sand to the wheels. For example the container 5 is provided with a valve 13 which is held normally closed by a spring 14. This valve is hinged on the upper side to the container by the hinge 15, (see also 36' Fig. 3) which valve may be opened by means of the

lever 16 that is hinged at its upper end to the jacket 7 and which has a link 17 connecting it to the valve, so that by rotating the lever 16 to the right, as for example by means
 5 of a foot controlled rod 18, the valve may be opened and the sand allowed to fall to the ground. When the rod 18 is released the spring 14 closes valve 13 and shuts off the sand. It will be seen that the lower portion
 10 of the jacket encloses and protects the valve.

In order to maintain the sand warm and dry, hot air is allowed to enter the jacket from the pipe 19, which air after circulating therein passes out via the nozzle 20 of the unit.
 15 The result is that not only is the sand kept warm but the valve and the working parts thereof are also kept warm and prevented from freezing in cold weather. The valve per se is the subject of the co-pending application Serial Number 513,349 filed by Merle
 20 B. Isenburg and myself.

The hot air may be supplied to the pipe 19, Fig. 1, by means shown in Fig. 13. This means comprises the exhaust line 21 from
 25 the engine that drives the vehicle. In this line a small turbine wheel 22 is located for driving a fan 23, which fan in turn is located in the hot air line 24. This last line comprises a chamber 25 which surrounds the muffler 26
 30 in the exhaust line, and a jacket section 27 that surrounds a portion of the exhaust line. By this means the air in the line 24 is heated and the heated air is blown forward by the fan 23 into the section 28 of the hot air line,
 35 which section is directly connected with the pipe 19 Fig. 1 through which latter the hot air reaches the jacket 7 of the unit A.

This pipe 28 may have a branch leading to each sand unit of the vehicle but I prefer to
 40 have a separate line similar to line 28, one for each unit leading off from the chamber 25. This multiple arrangement of pipes from this chamber is indicated in Fig. 14. The arrows in the hot air line and in the jacket 7 indicate the path along which the circulation of
 45 hot air takes place.

Instead of the movement of the air being produced by the fan 23, such fan may be omitted and an air pump, (which may be
 50 driven from the main shaft of the vehicle as shown in Fig. 8 of said co-pending application) may be substituted, from which pump a line may be connected to the left end of the jacket 27 Fig. 13.

If the bus has double wheels as indicated in Fig. 3, double sand units, such as the units D, E and F Figs. 3, 4 and 7, are substituted for the single type of Figs. 1, 2 and 5. The
 60 double units, like the single ones, are provided with sand containers, enclosed by jackets. For example the unit D is provided with a sand container 29, which is double, enclosed by a jacket 30, the former being provided with two outlets and the latter with two
 65 corresponding nozzles. This is more clearly

shown in connection with unit F, Fig. 3. Furthermore each outlet of the container is provided with a valve similar to the one shown in Fig. 1. In Fig. 4 the left valve of unit D is indicated and in Fig. 3 the right
 70 valve of unit F is indicated. It will be understood that the valves for the outlets of the containers are the same in all of the units A through F.

As indicated in Fig. 3, both the right and
 75 left valves are controlled through the medium of a single rod 31, similar to rod 32, Fig. 4, which in turn is similar to rod 18 Fig. 1. The rod 31 is connected to lever 33, which latter controls both valves of the unit F, through
 80 the medium of the link 34 and of the short rod 35, to each end of which rod a link 36, (only one of which is shown in Fig. 3) is provided that presses the corresponding valve open against the valve spring when the
 85 said control pedal is operated.

In Fig. 12 the pedal control for the single valve units of Figs. 1 and 2 is indicated, one
 90 pedal 37 of which controls the front valves and the other pedal 38 controls the rear valves. When this mechanism is used in connection with the double valve arrangement, each
 95 lever, such as lever 16, controls two valves, one on each side of the lever as indicated in Fig. 3 where lever 33 corresponds to lever 39 of Fig. 12.

In order to fill the containers of Fig. 1, the covers 9 and 10 must be raised but in Figs
 100 3, 4 and 5 I show means which will permit the sand being poured into the containers from the outside of the vehicle. For this purpose the covers 40 and 41 are provided with chutes which terminate in openings in
 105 the side of the bus. For example the chute 42 terminates in an opening 43 in the side 44 of the bus. This opening is provided with a door 45 which is shaped to guide the sand into the chute. On the inside the door is
 110 provided with flanges 46 which serve to hold the door in place when open. This door is provided with a spring catch 47, under which the upper edge of its door may be snapped
 115 and held to close the mouth of the chute as indicated at the left side in Fig. 3. A shield 48 is provided over the mouth of the chute to prevent water from running into the container.

Referring to Figs. 6 and 7 it will be understood that the pipe 49 corresponds to the pipe
 120 19 and is for the same purpose.

Referring to Figs. 1 and 4 it will be seen that within every container I provide a paddle for stirring the sand, to prevent it from
 125 crusting, each of which paddles is driven by any suitable means, as for example by an electric motor 50 or directly from the driving shaft. Also in connection with the valve
 130 spring 14, see Fig. 1, I provide an adjustable screw 51 for regulating the tension of the spring.

In connection with each sand container I provide an electric signal device for indicating when the sand is low. This device is under the control of switch 52 and comprises a lamp signal 53 and is fully described in said co-pending application.

Referring to Fig. 8 I show a jacketed sand container unit made in the form and to serve as a fender. This form may be annular as indicated in this figure and in Fig. 11 or it may be concavo-convex as ordinary fenders for pleasure vehicles. This unit on the other hand may be provided separate from the fender in which case the unit may be placed over the fender as indicated in Fig. 10. This unit comprises a casing 54 within which are inclosed elliptical conduits 55 and 56 which serve as jackets through which hot air may circulate. These jackets may be closed at both ends, the air entering by way of a pipe 57 and leaving by way of pipes 58, one such being provided at each lower end of the unit. This arrangement can be used with the heating means shown in Fig. 14 which, as will be seen by comparing Figs. 14 and 13, are similar in certain respects, the main difference being that the branches 59 leading off from the chamber 60 (which latter corresponds to chamber 25) after passing through the jackets of the sand units join the exhaust line 61. It will be seen therefore that the pipe 57 of the unit of Fig. 11 may be connected to one of the pipes 59 after the latter leaves the chamber 60 and that pipe 58 may be connected to the pipe 59' which joins the exhaust line. The other sand units of the vehicle are similarly connected between other branch pipes 59 and the exhaust. It will be seen therefore that the exhaust creates a suction in the chamber 60 and in the units connected therewith which maintains the desired flow of hot air through the units. I am aware that the exhaust gases are in some cases used for directly heating certain forms of receptacles but such arrangement has the disadvantage that the receptacles become filled with soot.

It will be understood that each wheel of the vehicle may be provided with either one or two of the sand units and that all of the valves may be controlled through the medium of the pedals, rods and links indicated in Fig. 12.

What I claim is:—

1. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said con-

tainer having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle.

2. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said container having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, said air passage in said unit being also connected with said nozzle, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm as it passes out of the nozzle, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle.

3. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said container having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle, and means for creating a difference of pressure along said air passages to cause the hot air to pass through said unit.

4. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said

line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said container having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, said air passage in said unit being also connected with said nozzle, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm as it passes out of the nozzle, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle, the exhaust pipe of the engine being connected, beyond said container, with reference to said heater with said air passage whereby a difference of pressure is created along said air passage to cause the heated air to pass through said unit.

5. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said container having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, said air passage in said unit being also connected with said nozzle, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm as it passes out of the nozzle, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle, and means for creating a difference in pressure along said air passage to cause the heated air to pass through said unit, said means comprising also a turbine in the exhaust line of the engine and a fan in the passage of the heated air.

6. In a road vehicle, a unit comprising a sand container and a jacket with an air chamber adjoining said sand container and independent of the sand chamber in the container whereby the sand may be heated by passing hot air through said chamber, said unit being in the form of a fender.

7. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said

line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said container having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle, the under side of said unit conforming to the form of a fender whereby the unit may be located over a wheel of said vehicle.

8. In a road vehicle, a unit comprising a sand container and a jacket, an air passage between the jacket and the container, an engine for driving said vehicle having an exhaust line, an air heater comprising a jacket about said line and having an air passage between the jacket last mentioned, and said line, whereby air entering said passage at one end, while the engine is running, is heated by the time it reaches the other end thereof, said other end being connected with the air passage in said unit, said container having an outlet and a valve thereat, said jacket first mentioned having a nozzle enclosing said outlet and valve, the opening in the nozzle being located below and in proximity to said valve whereby when the valve is opened the sand will fall through said nozzle and whereby the heated air will maintain the valve and the nozzle warm, said nozzle being located to allow the sand to fall in the path of a wheel of the vehicle, each wheel of said vehicle being provided with two of said units, one on the front side of each wheel and one on the rear side thereof and pedal means for operating the valves of half of said units and duplicate pedal means for operating the valves of the other half of said units.

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