June 19, 1934. G. G. SHELDON 1,963,532

TRACTION SANDER

Filed Nov. 23, 1931 2 Sheets-Sheet 1

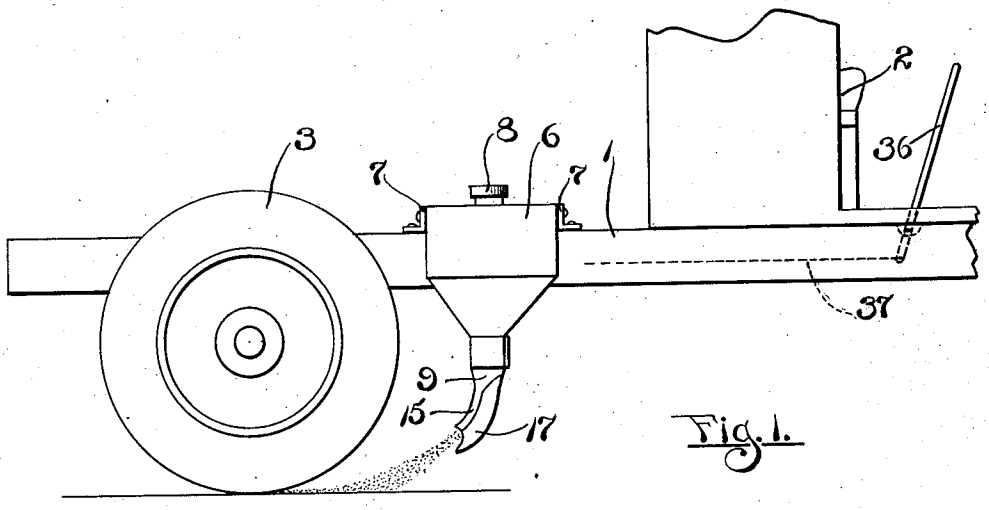


Fig. 1.

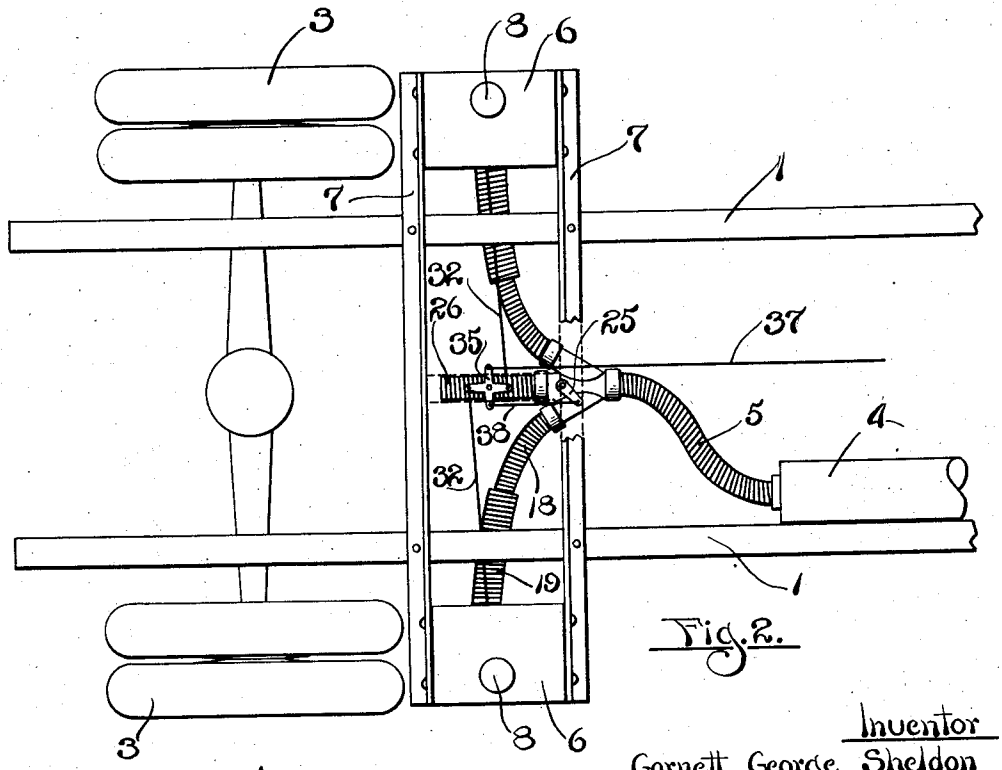


Fig. 2.

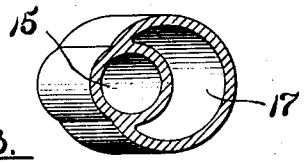


Fig. 3.

Inventor
Garnett George Sheldon
By Livernace and Van Antwerp
Attorneys

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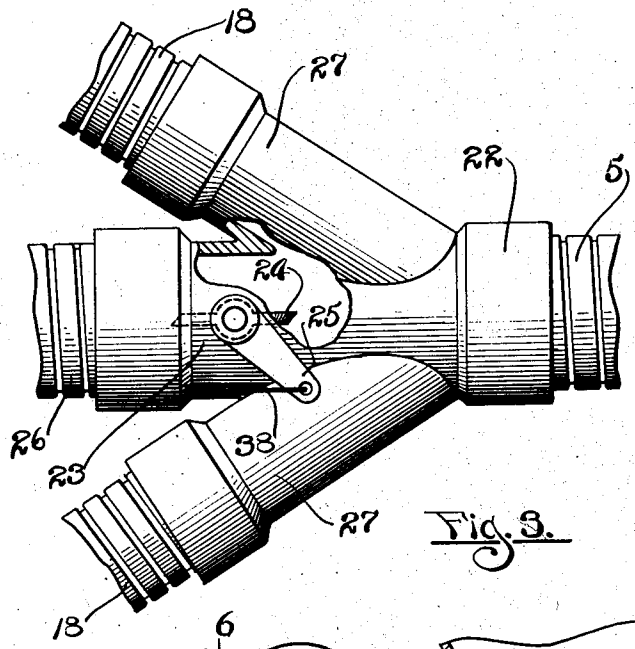


Fig. 3.

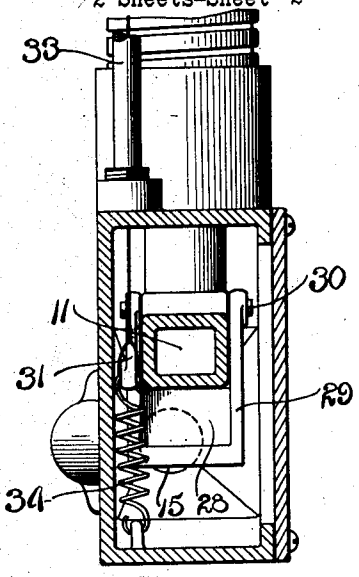


Fig. 4.

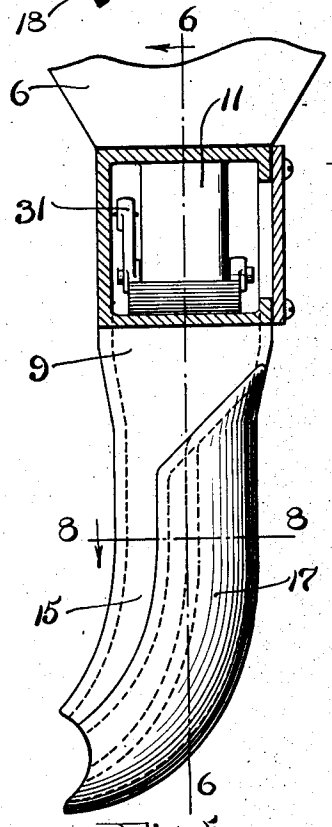


Fig. 5.

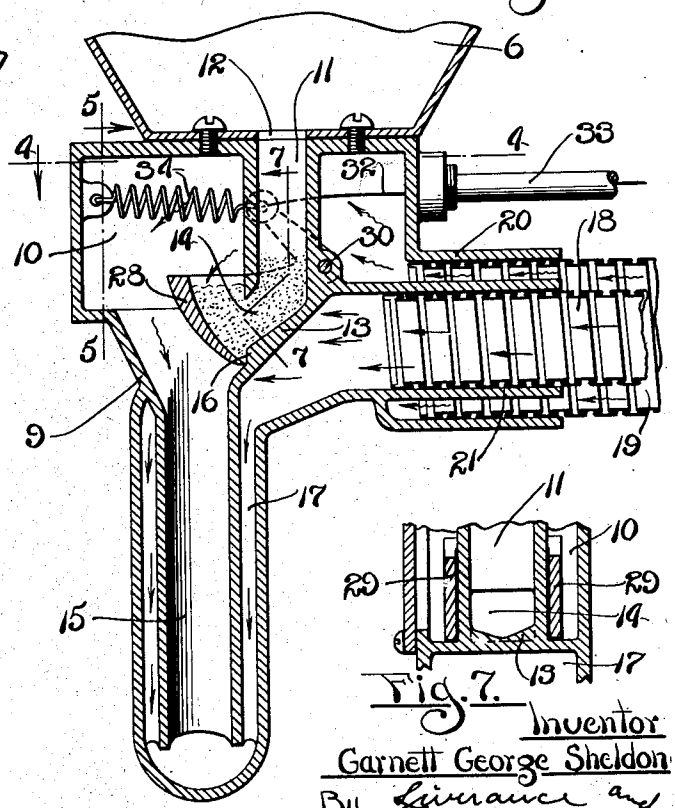


Fig. 6.

Fig. 7.

Inventor
Garnett George Sheldon
By Lemance and Van Antwerp
Attorneys

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UNITED STATES PATENT OFFICE

1,963,532

TRACTION SANDER

Garnett George Sheldon, Grand Rapids, Mich., assignor to Leonard Motorless Aircraft Company, Inc., Grand Rapids, Mich., a corporation of Michigan

Application November 23, 1931, Serial No. 576,682

14 Claims. (Cl. 291—3)

This invention relates to traction sanders and more particularly to devices which are adapted to apply sand or other material to the road in front of the tread of a vehicle wheel to increase the frictional contact between them.

Such devices are particularly useful on icy roads or roads which have become slippery because of grease or other substances thereon and under such conditions the application of sand or other granular substances to the road surface at a point at or in front of the contact of the tire therewith will greatly increase the traction.

A principal object of this invention is to provide means to cause the sand to flow freely under all conditions and to maintain the working parts in operative order. Considerable difficulty has been experienced in analogous devices due to moisture in the sand and on certain of the operating parts and especially in cold weather when such moisture freezes and prevents flow of the sand and operation of the parts. A further object of the invention is to provide means for utilizing exhaust gases of the engine of the automobile to which the device is applied for the purpose of both heating the device and the sand therein and for carrying the sand forcibly to the proper location.

The invention provides various novel features of construction and arrangement as hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, in which,

Fig. 1 is a side elevation of the rear portion of a motor vehicle showing a device embodying this invention in operative position thereon.

Fig. 2 is a plan view of said rear portion of an automobile showing two of the devices operatively connected thereto.

Fig. 3 is an enlarged fragmentary view of the member for dividing and controlling the flow of exhaust gases.

Fig. 4 is a sectional plan on the line 4—4 of Fig. 6 showing the means for controlling the flow of sand.

Fig. 5 is a side elevation, partially in section, on line 5—5 of Fig. 6 showing the outlet spout and a portion of the interior of the mechanism.

Fig. 6 is a sectional elevation transversely of the vehicle on the line 6—6 of Fig. 5 illustrating essential parts of the sander structure.

Fig. 7 is a fragmentary sectional elevation on the line 7—7 of Fig. 6, and

Fig. 8 is a transverse section through the spout on the line 8—8 of Fig. 5.

Like reference numbers refer to like parts in all of the figures.

1 represents the frame of an automobile which has a driver's seat 2 and wheels, particularly driving wheels 3 which are customarily the rear wheels of the vehicle. The automobile is provided with the customary internal explosion engine, not shown, the exhaust gases of which are conveyed to the conventional muffler 4 mounted on the frame of the vehicle, which muffler has an outlet pipe 5.

The sanding devices embodying this invention are preferably provided in pairs, one located forward of each rear or driving wheel and each sanding device comprises a sand container or hopper 6 which is preferably used as the body by which the device is mounted on the frame of the vehicle. The means for mounting the sanders herein shown consists of two beams 7 extending in spaced apart relation transversely of the frame 1 and having the hoppers 6 suspended between them near their respective ends. Each hopper 6 is provided at its upper side with a cap 8 covering an opening through which the hopper may be filled.

A casting 9 is attached to the lower end of the hopper 6 which casting is provided with various passageways and chambers as hereinafter described. At the upper portion of the casting is a hot air chamber 10 and within the chamber 10 is a vertical sand passage 11 the upper end of which communicates with the interior of the sand hopper 6 through an opening 12 in the bottom thereof. The lower end of the sand passage 11 terminates in an inclined plate 13 which is preferably formed as an integral part of the casting 9 and a side wall of the passage 11 near the lower side of the inclined plate 13 has an outlet opening 14 which opens into the hot air chamber 10. The vertical walls of the passage 11 are all located within the hot air chamber 10 and spaced from the sides of said chamber.

A downwardly extending and rearwardly curved sand spout 15 is formed in said casting and communicates at its upper end with the hot air chamber 10, its upper end being outwardly flared or funnel shaped and merging into the inclined plate 13 whereby sand passing through the opening 14 and over the plate 13 will be deposited into the upper end of the sand spout 15. The upper surface of the inclined plate 13 is depressed near its center and has a declivity 16 at a point substantially under the opening 14.

The forward portion of the sand spout 15 is surrounded by an exhaust jacket 17, which jacket

terminates at its lower end substantially flush with or slightly beyond the lower end of the sand spout 15 and at its upper end it communicates with an exhaust pipe 18. The upper end of the exhaust jacket also encloses the under surface of the inclined plate 13 and the exhaust pipe 18 connects with the jacket 17 at a location opposite the underside of the plate 13 and in a direction to cause gases entering said jacket through said pipe to impinge directly against the underside of the inclined plate.

A hot air pipe 19, considerably larger than the exhaust pipe 18, surrounds said exhaust pipe 18 and communicates with the interior of the hot air chamber 10, the casting 9 being formed with a socket 20 to receive said pipe 19, which socket 20 surrounds and is spaced from a corresponding socket 21 which receives the exhaust pipe 18. The hot air pipe 19 extends from the socket 20 some distance along the exhaust pipe 18 and terminates with its outer end opening to the atmosphere.

The outlet pipe 5, leading from the muffler 4, joins a member 22 which has three passages therethrough, all communicating with the pipe 5. One of said passages 23 is arranged in alinement with the pipe 5 and is provided with a valve 24 which has a lever 25, the normal position of said valve being open to permit exhaust gases entering the member 22 from the pipe 5 to pass freely out through the passage 23 and through a pipe 26 connected therewith. Two diverging passages 27 are also formed in the member 22 and diverge outwardly in the direction of the flow of the exhaust gas, each of said members being connected to one of the exhaust pipes 18 leading to each of the respective sanders.

A gate is mounted within the hot air chamber 10 in a manner to stop the flow of sand through the opening 14, said gate comprising a curved wall 28 and spaced apart side members 29, which side members straddle the exterior of the vertical sand passage 11 and are pivoted at 30 to the casting 9. An arm 31 is formed on one of the side members 29 and is attached to an operating wire 32, the wire 32 extending through a tube 33, which tube serves as a housing for the wire 32 and may be used or not as desired. A spring 34, attached at one end to the arm 31 and at the other end to a wall of the chamber 10, serves to yieldably hold the gate 28 in closed position.

Closed position of the gate is with its lower edge against the upper surface of the inclined plate 13, preferably at a point adjacent the declivity thereon. The purpose of the declivity 16 is to prevent accumulation of sand at the point where the lower edge of the gate engages the plate 13. In this position the lower edges of the side members 29 also engage said plate 13 and the upper edges of the portions 28 and 29 are above the upper side of the opening 14. The curved member 28 is located some distance away from the walls of the passage 11 and sand flowing through said passage and out of the opening 14 will lie within the members 28 and 29 of the gate but will be exposed upwardly to the interior of the hot air chamber 10 and to the air circulating therethrough.

A so-called "star" member 35 is utilized to simultaneously operate all parts of the structure by manipulation of a single hand lever 36 located conveniently to the driver's seat 2 of the vehicle where it may be readily reached for operation. The star member 35 consists of four radially extending arms, the member being pivotally mounted to some part of the automobile structure, and one of the arms of the star member is connected by a cable 37 to the hand lever 36. Two other arms of the star member are connected respectively to the wires 32 of the respective sanders and the fourth arm is connected by a cable or rod 38 to the lever 25 of the valve 24 in the member 22.

Operation

Assuming the automobile engine to be running and throwing off a stream of hot exhaust gases into the muffler 4 and that the parts of the sanding devices are inoperative to deliver sand, in which positions the gates 28 will be closed and the valve 24 will be open, the exhaust travels from the muffler 4 through the pipe 5 and into the member 22 where, because of the open valve 24 and the direction of introduction of the gas, the most of it will pass straight through the member 24 and out through the passage 23 and the pipe 26. However, some of the exhaust gas will be diverted through the passages 27 and the exhaust pipes 18 through which it will find its way into the exhaust jacket 17 of each of the sanding devices. Upon first entering said jacket the exhaust gas is directed against the underside of the inclined plate 13 which will keep said plate constantly hot and the gases will then flow downwardly through the jacket 17 and out of the lower end thereof maintaining said sand spout 15 in a warm condition.

Inasmuch as exhaust gases to some extent constantly flow through the pipes 18 while the engine is operating said pipes are maintained heated and therefore air within the hot air pipes 19 surrounding the exhaust pipes 18 will also be somewhat heated and such air will flow into the hot air chamber 10 and circulate around the vertical sand passage 11, the sand within the gate 28 being exposed to said chamber 10, and thence outwardly through the sand spout 15. Movement of the vehicle will cause air circulation through the said parts 19, 10 and 15. The gate 28, as well as all of its operating parts, such as the pivot 30, the spring 34 and the wire 32 are all located within the hot air chamber 10 and contacted by the air circulating therein.

The exhaust gases from an internal combustion engine contain considerable moisture and this structure conducts such gases only to parts and locations of the device which will not be disadvantageously affected by moisture. The air heated within the hot air pipe 19 and introduced into the chamber 10 is taken from the exterior atmosphere and does not contain such moisture as the exhaust gases and therefore its circulation within the chamber 10 and contact with the parts therein and with the sand contained within the gate tends to keep such parts and sand warm and dry to insure proper operation of the parts and proper flow of the sand under all conditions and especially in cold weather when the device is most useful.

When it is desired to apply sand to the road the hand lever 36 is operated to pull the cable 27 which rotates the star member 35 and simultaneously pulls the cables 32 and 38 to close the valve 24 and lift the gates 28. Lifting each gate 28 permits the sand accumulated therein to drop into the sand spout 15 and also sand from the hopper 6 to flow through the passage 11 and opening 14 into sand spout and such flow of sand will continue as long as the gates are raised and the sand will flow by gravity downward through the spout and out of the lower end thereof. It is

considered, however, that in normal use no more sand will be used for a single occasion than is contained within the passage 11 and within the gate 28, which sand has been well heated both by circulation of heated air in the chamber 10 and by heat transmitted through the plate 13 which is heated by exhaust against its underside.

Closure of the valve 24 at the same time the gates 28 are lifted completely stops the flow of exhaust gas through the passage 23 and forces all of the exhaust gas from the engine to flow through the passages 27, the exhaust pipes 18 and eventually through the exhaust jackets 17. This flow of gas has considerable force and inasmuch as the jackets 17 open beneath the lower end of the sand spout 15 the gas flowing therethrough will pick up and forcibly throw rearwardly the sand flowing out of the lower end of the sand spout and the direction of the gas is governed by the shape of the outlet and of the exhaust jackets 17 to carry the sand to a position where the wheels 3 engage the road surface.

I claim:

1. In a device of the class described, a sand container, an outlet passage for said container, a pivoted gate to close said passage, a lever arm for actuating said gate, means for heating atmospheric air by heat derived from an internal combustion engine and for directing said heated atmospheric air to circulate around said passage, gate and lever arm.

2. In a device of the class described, a sand container, a hot air chamber, an outlet passage communicating with said sand container and extending through said hot air chamber, a valve in said outlet passage, said passage having an opening directly communicating with the hot air chamber above the said valve and means for heating atmospheric air by heat derived from an internal combustion engine and for circulating said air within said hot air chamber.

3. In a device of the class described, a sand container, a hot air chamber, an outlet passage communicating with said sand container, a movable gate to stop the flow of sand through said outlet passage, spring means for closing said gate, said gate and closing means being located within said hot air chamber and means for introducing heated air into said hot air chamber.

4. In a device of the class described, a sand container, a hot air chamber, an outlet passage communicating with said sand container and extending through said hot air chamber, a movable gate to stop the flow of sand through said outlet passage, means for actuating said gate, said gate and actuating means being located within said hot air chamber and means for heating atmospheric air from heat derived from an internal combustion engine and for introducing said heated air into said hot air chamber.

5. In a device of the class described, a sand container, an outlet passage therefor, a gate arranged to stop the flow of sand through said outlet passage, means for actuating said gate, a hot air chamber surrounding said outlet passage and communicating directly with the outlet passage above said gate and means for admitting air into said hot air chamber.

6. In a device of the class described, a sand container, an outlet passage therefor, a gate arranged to stop the flow of sand through said outlet passage, means for actuating said gate, a hot air chamber surrounding said outlet passage, said gate and said actuating means, said hot air chamber communicating with said outlet passage and means for heating atmospheric air by heat derived from an internal combustion engine and for admitting said heated atmospheric air to said hot air chamber from where it may be ejected through said outlet passage.

7. In a device of the class described, a sand container, an outlet passage therefor, a movable gate arranged to stop the flow of sand through said outlet passage, means for directing exhaust gas from an internal combustion engine against an exterior surface of a wall of said outlet passage and means for circulating heated atmospheric air around said exhaust passage and said movable gate.

8. In a device of the class described, a sand container, an outlet passage therefor, a movable gate arranged to stop the flow of sand through said outlet passage, means for directing exhaust gas from an internal combustion engine against an exterior surface of a wall of said outlet passage and means for heating atmospheric air from the exhaust gases of an internal combustion engine and for circulating said heated atmospheric air around said exhaust passage and said movable gate.

9. In a device of the class described, a sand container, a hot air chamber, an outlet passage communicating with said sand container and also communicating with said hot air chamber, a movable gate located within said hot air chamber and arranged to stop the flow of sand through said outlet passage and to expose said sand to the interior of said hot air chamber and means for introducing atmospheric air into said hot air chamber.

10. In a device of the class described, a sand container, a hot air chamber, an outlet passage communicating with said sand container and also communicating with said hot air chamber, a movable gate located within said hot air chamber and arranged to stop the flow of sand through said outlet passage and to expose said sand to the interior of said hot air chamber and means for heating atmospheric air from heat derived from an internal combustion engine and for introducing such heated atmospheric air into said hot air chamber.

11. In a device of the class described, a sand container, an outlet passage therefor having an outlet opening, an inclined plate forming a part of the wall of said outlet passage adjacent said outlet opening, a movable gate arranged to stop the flow of sand through said outlet opening, a sand spout arranged to receive sand flowing through said outlet opening, means for directing exhaust gases from an internal combustion engine against the outer surface of said inclined plate, a hot air chamber surrounding said outlet passage and said movable gate and communicating with said sand spout and means for introducing heated atmospheric air into said hot air chamber.

12. In a device of the class described, a sand container, an outlet passage therefor having an outlet opening, an inclined plate forming a part of the wall of said outlet passage adjacent said outlet opening, a movable gate arranged to stop the flow of sand through said outlet opening, a sand spout arranged to receive sand flowing through said outlet opening, means for directing exhaust gases from an internal combustion engine against the outer surface of said inclined plate, a hot air chamber surrounding said outlet passage and said movable gate and communicating with said sand spout, means for exposing sand retained by said gate to the interior of said hot

air chamber and means for introducing heated atmospheric air into said hot air chamber.

13. In a device of the class described, a sand container, an outlet passage therefor having an outlet opening, an inclined plate forming a part of the wall of said outlet passage adjacent said outlet opening, a movable gate arranged to stop the flow of sand through said outlet opening, a sand spout arranged to receive sand flowing through said outlet opening, means for directing exhaust gases from an internal combustion engine against the outer surface of said inclined plate and sand spout, a hot air chamber surrounding said outlet passage and said movable gate and communicating with said sand spout and means for introducing heated atmospheric air into said hot air chamber.

14. In a device of the class described, a sand container, a substantially vertical outlet passage therefor, an inclined plate serving as a bottom for said outlet passage, there being an outlet opening in a wall of said passage adjacent the lower edge of said inclined plate, a declivity on the upper surface of said inclined plate and a movable gate arranged opposite said opening and adapted to have its lower edge engage said inclined plate in close proximity with said declivity.

GARNETT GEORGE SHELDON.