G. H. GRAY.

OIL SPRAYING APPARATUS.

APPLICATION FILED MAY 25, 1912.

1,097,090.

Patented May 19, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

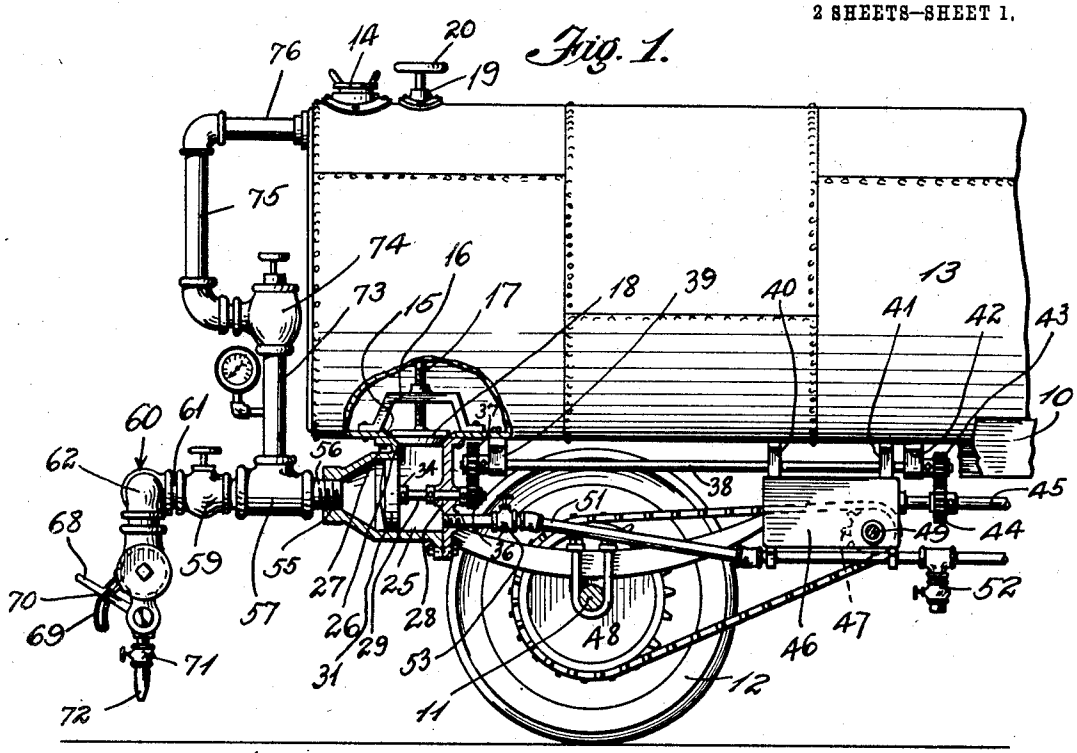


Fig. 2.

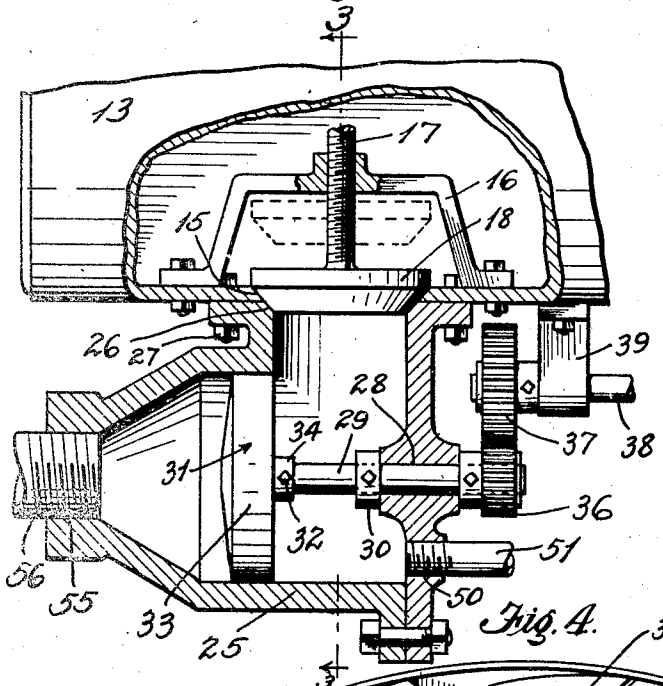


Fig. 3.

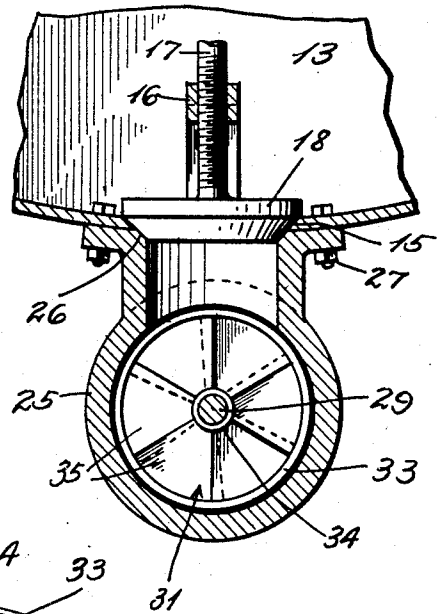
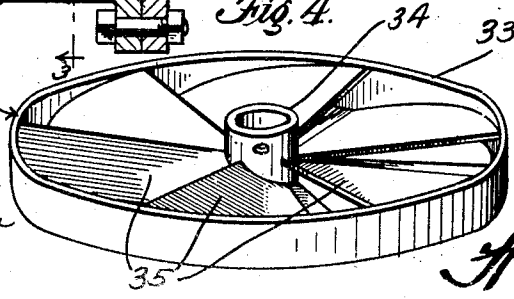


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

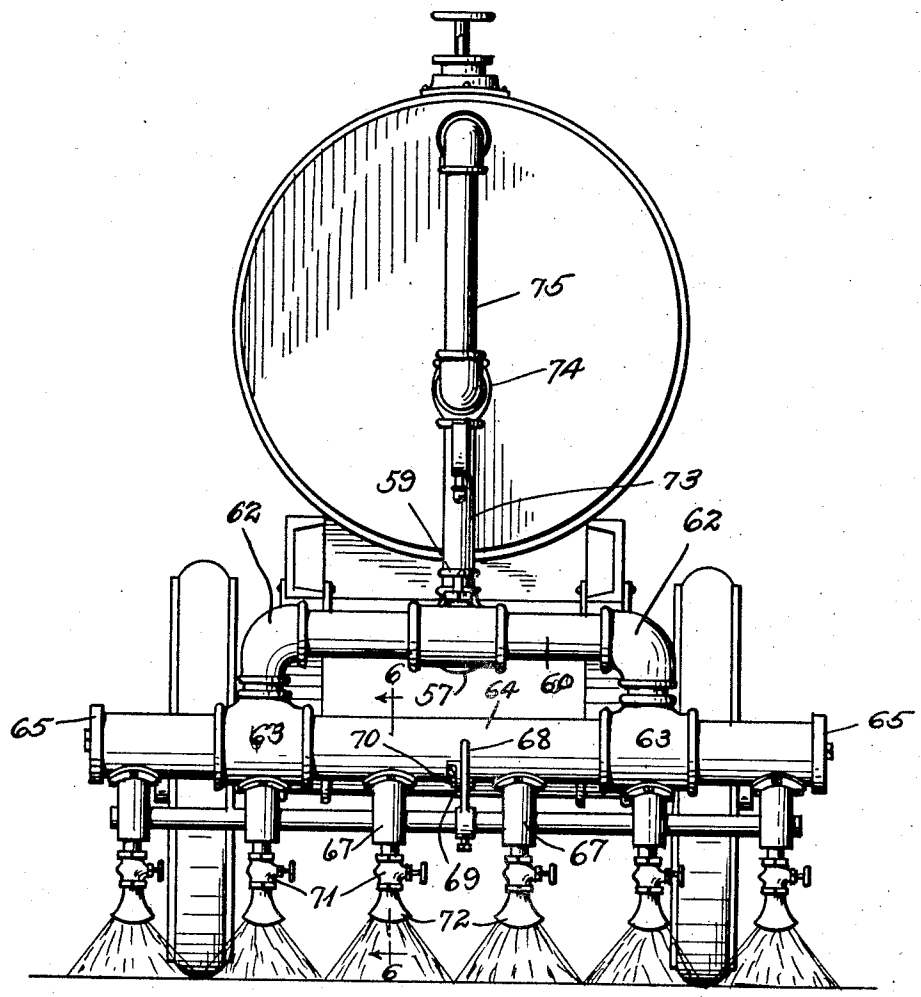
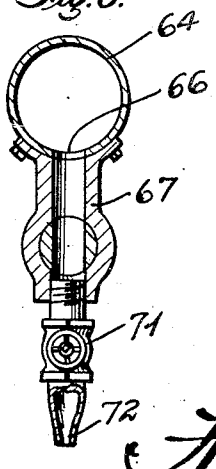


Fig. 6.



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UNITED STATES PATENT OFFICE.

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OIL-SPRAYING APPARATUS.

1,097,090. Specification of Letters Patent. Patented May 19, 1914.

Application filed May 25, 1912. Serial No. 699,664.

To all whom it may concern:

Be it known that I, GRANVILLE H. GRAY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Oil-Spraying Apparatus, of which the following is a specification.

This invention relates to improvements in apparatus for spraying oil upon roadways and it relates more specifically to a mechanism for forcing the oil outwardly from the containing tank through a distributing mechanism mounted on the rear of the apparatus, and a prime object thereof is to provide a propelling mechanism whereby the oil may be forced from the tank into the distributing mechanism with a whirling motion, so as to deliver the oil to the spraying mechanism under pressure.

Another object is to provide a simple means to utilize the exhaust gases of the vehicle motor for heating the propeller and its casing prior to the passage of oil therethrough, and also to thoroughly cleanse the same after a spraying operation of the apparatus.

A further object of the invention is to provide an oil distributing mechanism, in which the oil pressure means located therein may be operated from the same source of power which furnishes power to drive the apparatus.

I accomplish these objects by means of the apparatus described and illustrated in the accompanying drawings in which—

Figure 1 is a partial side elevation of the rear end of my apparatus with the oil pressure mechanism in section. Fig. 2 is an enlarged central detail section of my improved mechanism. Fig. 3 is a central longitudinal section of my mechanism taken on line 3—3 of Fig. 2. Fig. 4 is a perspective view of the propeller mounted in the projecting mechanism. Fig. 5 is a rear elevation of my apparatus. Fig. 6 is a longitudinal section through one of the spraying nozzles of the distributing apparatus, the section being taken on line 6—6 of Fig. 5.

Referring more particularly to the drawings, 10 designates a vehicle running gear, 11 a rear axle and 12 the rear wheels. Mounted on the running gear is a tank 13, preferably cylindrical in form and constructed from boiler iron. The upper portion of the tank is provided with a filling port 14, and in the bottom thereof and adjacent the rear end is an annular beveled outlet opening 15, forming a valve seat. Diametrically disposed over the opening 15 and rigidly secured to the inner face of tank 13 is a yoke bearing 16 in which is mounted a valve rod 17, said rod being in screw threaded engagement with the bearing 16. To the lower end of valve rod 17 is secured an annular valve stopper 18, the upper end of the rod being secured in a bearing 19 in the top of the tank, a hand wheel 20 secured to the upper end thereof providing means for operating the valve. In lieu of hand wheel 20, a sprocket wheel and chain or others forms of gearing may be provided so that the valve may be operated from the driver's seat.

Secured to the under side and at the rear end of the tank 13 is a casing 25 of angular form, whose inlet opening 26 registers with the opening 15 in the tank, the casing being secured in fluid tight engagement thereto by means of bolts or rivets 27. The rear wall of the casing 25 is provided with a bearing 28 having a horizontally disposed shaft 29, mounted therein and held in position by collars 30. The inner end of shaft 29 which is horizontally disposed within the casing is provided with a propeller or projecting wheel 31 secured in place thereon by means of a set screw 32. This propeller wheel is preferably of the form illustrated in Figs. 3 and 4 of the drawing, and consists of an annular rim 33 and a hub 34, the vanes or blades 35 being secured to the inner periphery of the rim and to the outer periphery of the hub so that they are almost flat. These vanes or blades overlap each other as clearly shown in Fig. 4 so as to prevent an excessive back pressure while the propeller is being rotated, the construction also tending to force the oil forwardly and away from the front of the propeller to the distributing mechanism, which will be further described. On the outer end of the shaft 29 is mounted a pinion 36 which is in mesh with a pinion 37 mounted on the rear end of a driving shaft 38, the end of said shaft adjacent the gear 37 being supported by a bearing 39 rigidly secured to the under side of the tank 13. The forward end of shaft 38 is mounted in bearings 40, 41 42 secured to the under side of the tank 13, and its forward end is provided with a

gear 43, meshing with a pinion 44 which is rigidly secured to the transmission shaft 45, the transmission gearing being of usual form. Shaft 45 extends forwardly and is connected in any suitable manner with the shaft of the vehicle explosive engine, (not shown). The apparatus is provided with the usual transmission gearing 46, sprocket drive wheels 47, 48 secured respectively to shaft 49 of the transmission and the hub of one of the rear wheels 12.

The rear wall of the casing 25 below the propeller shaft 29 is provided with a port 50 in which is mounted one end of an exhaust pipe 51 that extends forwardly and is connected to the exhaust of the engine. Pipe 51 is provided with a relief valve 52 and a controlling valve 53, intermediate its length. By opening valve 52 and closing controlling valve 53 the exhaust of the engine may be directed into the atmosphere while by reversing the operation, the exhaust gases will be forced through port 50 into propeller casing 25 for the purpose of heating the propeller so as to further liquefy the oil passing therethrough during an oiling operation, and to cleanse the propeller and spraying mechanism after an operation of the apparatus.

The casing 25 is provided with an outlet port 55, into which is secured one end of a short threaded nipple 56, the outer end of the nipple being connected to the oil distributing or spraying mechanism which will now be more particularly described.

Secured to the outer end of nipple 56 is a T fitting 57 and mounted transversely of the apparatus and at the rear thereof is a distributing pipe 60 which is connected to the T fitting 57, by means of a nipple 61, a globe valve to control the flow of oil to the spraying mechanism being interposed between the same. The outer ends of distributing pipe 60 are provided with elbows 62 connecting with T fittings 63 as best shown in Fig. 5 of the drawings. Secured to fitting 63 is a lower transversely disposed oil distributing pipe 64, the outer ends being provided with screw threaded closures 65. This lower distributing pipe 64 is provided on the under side thereof with a plurality of oil outlet openings 66, each of the openings being provided with valves 67. These valves are adapted to be operated in unison for controlling and regulating the flow of oil therethrough.

A hand lever 68 mounted adjacent a slotted guide 69 and controlled by a set screw 70 provides means for operating the valves. Secured in the outlet ports of the respective valves 67 are spray valves 71, the outlet ports 72 being of flattened shape as clearly indicated in Fig. 6 of the drawing. By flattening the ends 72 of the outlet members of the valves 71, it will be apparent that when the oil is forced therethrough it will assume a fan shape as clearly illustrated in Fig. 5 of the drawing, so that when the oil is distributed along the surface of a roadway the whole will be thoroughly saturated and evenly sprayed.

It will be noted that by means of valves 71 the operation of any particular number of sprays may be controlled and by providing valves 67 the flow to valves 71 may be controlled in unison.

In order to provide for an excess of pressure generated by the revolving propeller so that it may be run continuously whether spraying or not, I have provided a by pass mechanism which consists preferably of a vertically disposed pipe 73 secured in screw threaded engagement with the T fitting 57, the upper end of the pipe being provided with a pressure regulating valve 74.

In screw threaded engagement with the valve 74 is a return pipe line 75, the upper end 76 entering the tank 13 as clearly shown in Fig. 1 of the drawing. When the pressure has become excessive or for any reason it is desired to reduce the same, valve 74 will open automatically to slight extent to permit a portion of the fluid which is being forced through valve 25 upwardly and back into the tank. If it is desired to stop the spraying operation at any time, without shutting off the transmission power to the propeller, valve 59 may be closed, then valve 74 will open automatically to its fullest extent so that all the fluid may be forced upwardly through pipe 73, valve 74 and pipe line 75 and 76 and into the tank.

In the operation of my apparatus the tank being filled with crude oil that is utilized in the formation of roadways, the valves 71 are opened to the desired extent as well as valve 59, valves 67 being also opened by means of hand lever 68 to control the flow through the distributing valves 71. The apparatus is then started and valve 18 is opened by the operator to permit oil from the tank to flow through the casing 25, the projector 31 which is rotated by gearing driven by the vehicle motor rapidly forcing the oil from casing 25 through the valve 71 and thence through the distributing or spraying mechanisms to the roadway. If at any time the pressure becomes excessive the by-pass valve 74 will automatically open slightly to permit a portion of the fluid which is being forced through the distributing system to pass upwardly through the by-pass mechanism and into the tank 13.

By utilizing pipe line 51 so as to force the exhaust gases from the vehicle engine through casing 25. I am enabled to heat the casing and the oil distributing or spraying mechanism so that the oil passing therethrough will readily flow in a finely divided stream from the nozzles 72. During

the process of oiling, valve 53 is closed and valve 52 is opened so as to allow the exhaust gases to pass to the atmosphere. It will also be noted that by means of utilizing the exhaust gas of the engine when valve 18 is closed I am enabled to cleanse the casing and propelling mechanism as well as the spraying device, thoroughly so as to force all impurities therefrom that may collect from time to time during the operation of my apparatus.

What I claim is:

An apparatus for spraying oil on roads, comprising a power operated vehicle, an oil storage receptacle having an outlet mounted on said vehicle, valve means extending through said receptacle to control said outlet, a casing secured to said receptacle adjacent said outlet and having an inlet opening registering with said outlet and an exit opening, a projecting mechanism mounted in said casing intermediate said openings therein, gear means to operate said projecting mechanism, means located on said vehicle for operating said gear means, an oil distributing means secured to said casing in operative connection with said exit opening, valve means for controlling the flow of fluid through said distributing means, means to introduce heat into said casing and through said distributing means, and a bypass secured to said distributing means and communicating with said storage receptacle, whereby when the pressure becomes excessive a portion of the fluid will be forced back to the receptacle without altering the speed of the projecting mechanism.

In witness that I claim the foregoing I have hereunto subscribed my name this 14th day of May, 1912.

GRANVILLE H. GRAY.

Witnesses:

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