

May 12, 1931.

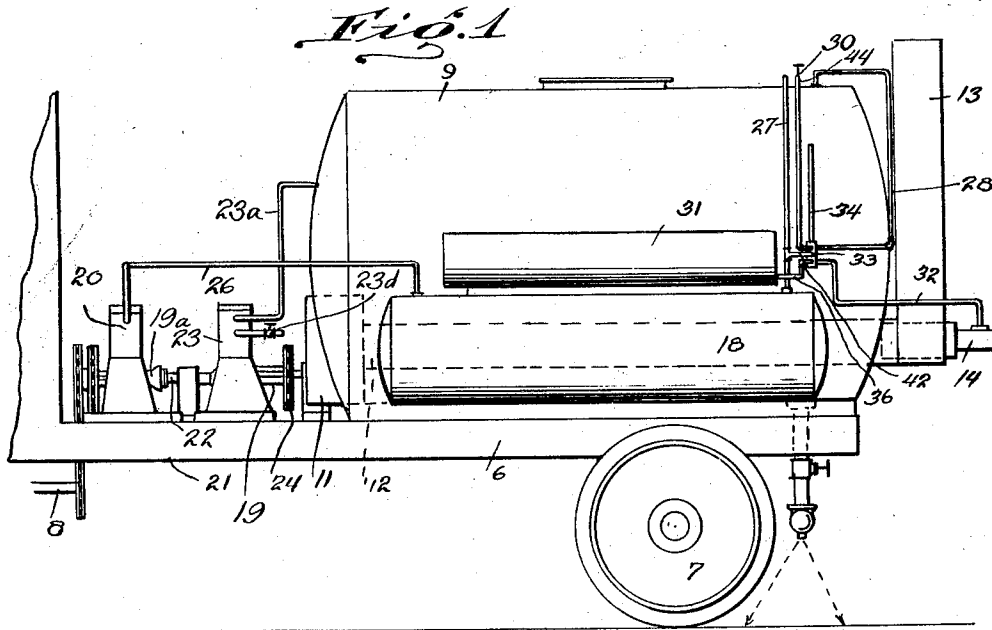
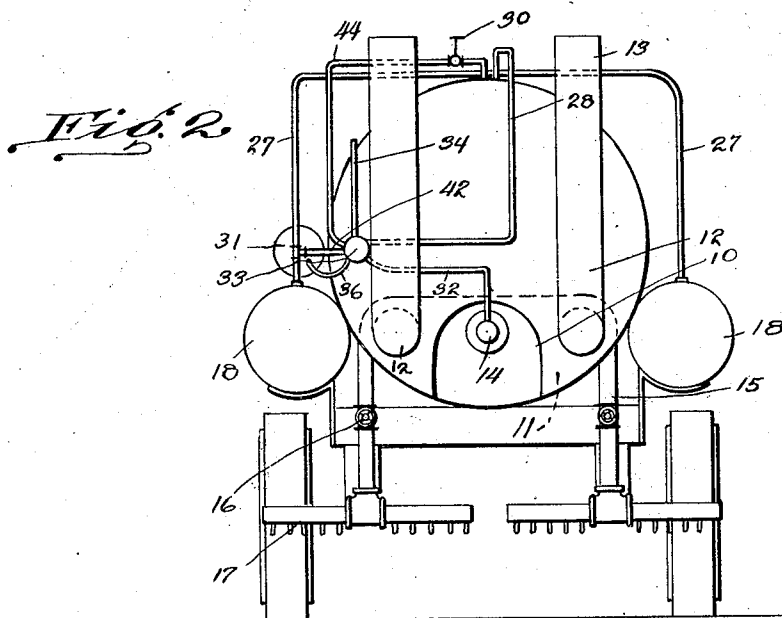
C. D. CHASE

1,804,592

DISTRIBUTING TANK

Filed Oct. 19, 1927

2 Sheets-Sheet 1



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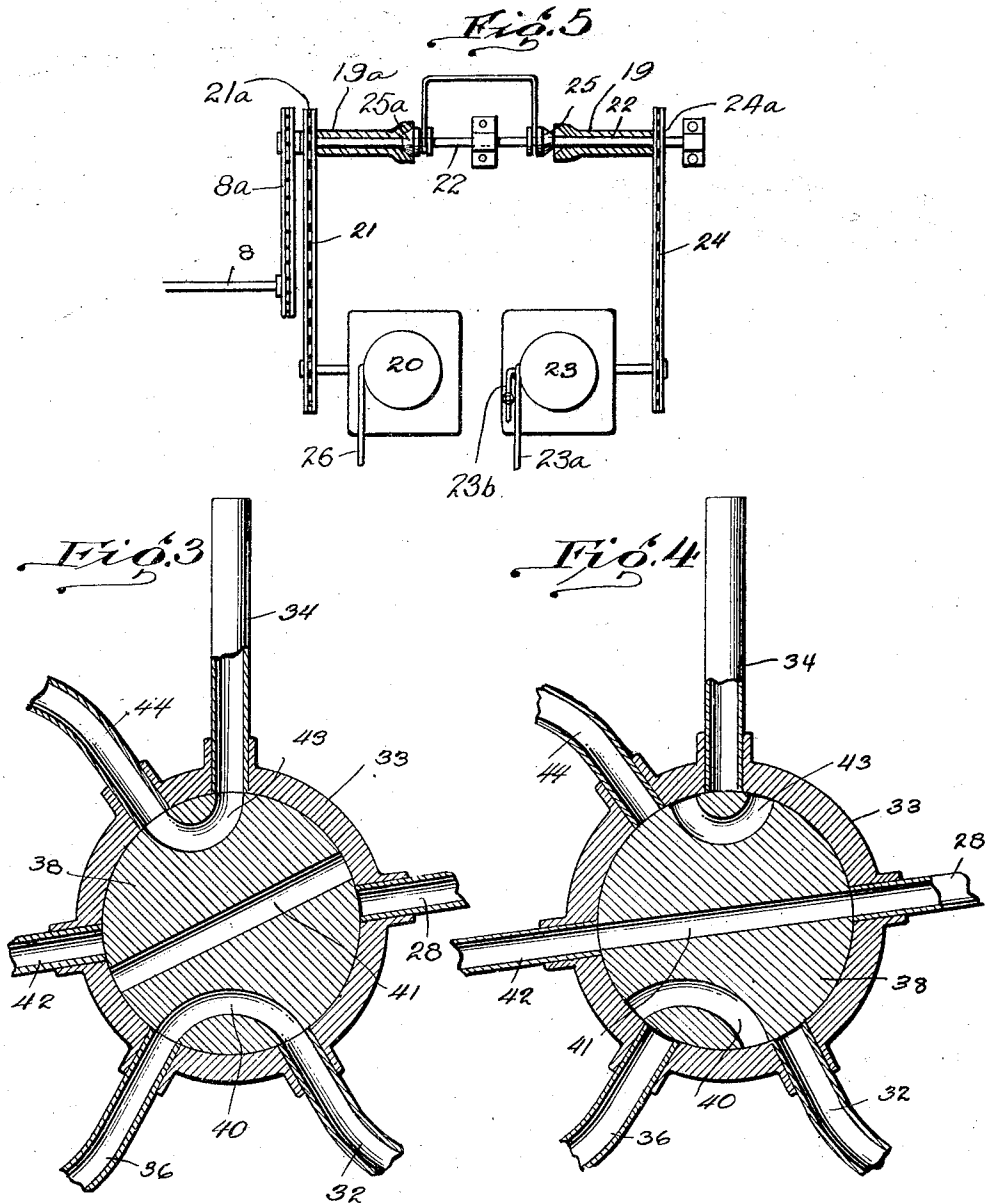
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2 Sheets-Sheet 2



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DISTRIBUTING TANK

Application filed October 19, 1927. Serial No. 227,343.

This invention relates to distributing tanks and more particularly to mobile tanks for distributing hot asphalt or the like along a roadway, altho it is to be understood that the invention is not limited to this particular adaptation, for obviously with slight modifications, the invention is capable of other applications among which may be noted that of spraying fluids along a railroad for the purpose of killing weeds. The invention, however, will be described more particularly with relation to the first application above stated.

One of the objects of the present invention is to provide a distributing tank which comprises self-contained apparatus for transporting and/or heating or treating asphalt prior to its distribution along the road.

A further object is to provide a compact, self-contained apparatus of the above general character which will be reliable and efficient in use and operation.

A further object is to provide an apparatus of the last above mentioned character which will be easy and safe to operate under all circumstances, and in which the danger of igniting the asphalt content or exploding the container when heated will be positively eliminated.

Other objects will be in part obvious from the annexed drawings and in part hereinafter indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relation of the members and in the relative proportioning and disposition thereof, all as more completely outlined herein.

To enable others skilled in the art to fully comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form of the invention have been annexed as part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all of the views, in which—

Fig. 1 is an elevation of the complete ap-

paratus with such parts shown as will be necessary to understand the invention;

Fig. 2 is a rear elevational view;

Fig. 3 is an enlarged detail of one form of valve in one position;

Fig. 4 is a similar view of the same parts in a different position; and

Fig. 5 is a detail diagrammatic view showing a portion of the power plant.

Referring now to the drawings in detail, and more particularly to Fig. 1, 6 indicates a vehicle frame, such as an automobile chassis, mounted upon suitable wheels 7 and provided with the usual source of power, only the take-off shaft 8 of which is herein shown. Mounted upon the chassis is a main heating tank 9 preferably of relatively large cylindrical construction into which the asphalt is pumped from any suitable source of supply, such as a tank car. As is well known to those familiar with the art, there is a decided tendency for asphalt to solidify on cooling, and it is therefore necessary to either use the asphalt at once while still hot, or provide means for reheating it or maintaining it at a temperature sufficient to give the desired fluidity.

For this purpose, there is provided a heating apparatus substantially as follows. The tank 9 at its bottom portion is provided with an upwardly extending hood 10 forming a combustion chamber and running substantially the entire length of and terminating in a chamber 11 at the front end of the tank. This chamber is wider than the elongated chamber formed by the hood 10 and communicates with return flues 12, Fig. 2, leading back thru the interior of the tank and connected with upwardly extending stacks 13.

At the rear end of the central chamber, there is provided an oil burner 14 of any desired type but preferably of that type in which oil and air under pressure are ignited to project a flame well into the central chamber so as to heat to a relatively high temperature the walls of hood 10 which are directly in contact with the asphalt and maintain the asphalt in a fluid condition. The products of combustion from the central chamber pass into the transverse chamber 11 and return

thru the flues 12 to the stacks 13. In this manner, the entire lower part of the tank is heated to any desired degree and the asphalt maintained in a fluid condition.

5 The melted asphalt is distributed along the road in any approved manner, but it is preferred to use a sprinkling system substantially as shown in Fig. 2. Near the lower part of the main tank 9 are two tap-offs 15, each provided with a valve 16 and terminating in spreaders 17. The melted asphalt is forced out thru these spreaders 17 preferably under air pressure, for which purpose there is accordingly provided two air storage tanks 18 conveniently mounted at each side of the main receptacle 9. The air tanks are charged by an air compressor 20 driven by means of chain and sprocket connection 21 from an auxiliary power shaft 22 rotated as by sprocket drive 8a from shaft 8 as shown in Fig. 5. This auxiliary power shaft 22 is also adapted to drive an asphalt loading pump 23 by means of a chain and sprocket drive 24. Suitable clutch elements 25 and 25a rotate with shaft 22 and engage alternately with complemental clutch surfaces on sleeves 19 and 19a, which in turn rotate with sprocket wheels 24a and 21a, respectively, thus throwing the compressor and pump into and out of operation as and when desired. The pump 23 discharges into tank 9 thru line 23a, and is provided with an inlet connection 23b for coupling with a line to a tank car or other source of asphalt supply.

35 The air tanks 18 are filled from the compressor 20 thru an air line 26 leading to the tank at one side, which tank is connected by means of a cross line 27 with the air tank at the opposite side of the main tank 9. Two relatively small tanks are used in preference to one large tank for the sake of convenience and compactness, as they will conveniently fit in along the main receptacle and be supported directly by the side bars of the chassis frame.

The air tanks 18 are also connected with the interior of the asphalt tank 9 by means of pipe 28. At one side of the main tank 10, there is an oil tank 31 for supplying fuel oil to the burner 14 thru the pipe 32.

At this point, it should be noted that when the burner 14 is operating to heat the asphalt, there will naturally be an expansion of gases within the main tank 10, and suitable means must be provided for venting this pressure, for otherwise the tank 9 would act as a boiler with natural tendencies to explode under high pressures. In order to positively eliminate such a possibility, a fool-proof valve 33 is installed in the supply lines, thereby to connect the interior of the tank 9 with a vent 34 when the oil burner is in operation and to simultaneously close the vent and shut off the fuel supply to the burners when the air tanks 18 are opened to supply com-

pressed air to the interior of the tank for the purpose of ejecting the melted asphalt thru the distributors 17. This valve 33 is shown in detail in Fig. 3.

As herein shown in Fig. 3, the tank 9 is venting, and oil which is supplied thereto for heating purposes, flows from the tank 31 thru pipe 36 to a rotatable valve plug 38 provided, as shown, with three through passages. The passage 40 permits registry between the pipe 36 from the oil supply tank and the pipe 32 to the burner. The air from tank 18 is blocked off by reason of port 41 failing to establish communication between air line 42 to the valve and air line 28 from the valve to the tank 9. Likewise the port 43 communicates with the vent pipe 34 and also the pipe 44 leading from the interior of the asphalt tank 9. From this, it will be evident that so long as the oil burner is permitted to operate, the vent will be open, and any danger of excessive pressures, causing a bursting of the boiler, will be positively eliminated. The burner may be shut off by merely rotating the plug 38 to the position shown in Fig. 4, whereupon the oil line is interrupted, the vent is shut off, and the compressed air from the tank 18 flows freely to the interior of the asphalt tank 9, thereby to eject the asphalt the moment the distributing valves 16 are opened. A regulating valve 30 in vent line 44 from the tank 9 may be provided to maintain the tank under a low pressure if it is desired to operate the burner at a low rate to merely keep up the temperature of the prior heated asphalt.

While it is believed that the operation and method of use of the apparatus herein set forth will be clear to those familiar with the art, it may be briefly stated, however, that in use the entire apparatus is driven to the source of supply or tank car and pump 23 connected therewith. Asphalt is then pumped directly into the tank 9 until it reaches a predetermined level. The vehicle is then driven to the place of use, but in the meantime, air compressor engine 20 is started in order to fill the compressed air tanks 18, and the burner 14 is lighted in order to maintain the asphalt within the tank 9 in its heated and fluid condition. In order to do this, the valve 33 is moved to the position shown diagrammatically in Fig. 3. When the place of road treatment is reached, the oil burner is shut off by moving the valve 33 to the position shown in Fig. 4, which as above explained, automatically cuts off the burner and allows the air from the compressed air tanks 18 to flow into the top of the tank 10. Then the distributor nozzles are opened by means of the valves 16 and the road sprayed with the hot asphalt. At any time thereafter as may be necessary, the burner may be relighted and the air tanks shut off. The air compressor is thrown into

gear by means of clutch 25 so as to maintain a proper and predetermined pressure within the supply tanks 18.

From the above, it will be seen that the present invention provides a simple and practical apparatus particularly adapted for distributing melted asphalt. The entire mechanism is very compact and self-contained and requires no auxiliary apparatus such as trailer trucks. Furthermore, the device is thoroughly safe under all conditions of use and operation, and there is no danger during normal operation of the main tank blowing up due to building up of pressure therein while the burner unit is in operation or becoming heated to such a degree as to ignite the contents. In describing the invention, omission has been made of many of the minor details, such as pressure gauges or automatic cut-outs between the air compressor and the air tanks, as they form no part of the invention but may be applied as and when necessary.

Without further analysis the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

I claim:

1. In an apparatus of the character described, in combination, a supporting frame, a heating tank mounted thereon, a source of heat directly associated with said tank for heating the contents thereof, and means for insuring venting of the tank when the source of heat is in operation.

2. In an apparatus of the character described, in combination, a supporting frame, a tank mounted thereon having passages therethru, an oil burner for supplying heat thru said passages to heat the contents of the tank, a vent connection from the interior of said tank, and means for opening said vent when the burner is in operation and closing said vent when the burner is turned off.

3. In an apparatus of the character described, in combination, a supporting frame, a tank mounted thereon having passages therethru, an oil burner for supplying heat thru said passages to heat the contents of the tank, a vent connection from the interior of said tank, means for opening said vent when the burner is in operation and closing said vent when the burner is turned off, and means for supplying compressed air to the interior of said tank when the vent is closed.

4. In an apparatus of the character described, in combination, a tank having pas-

sages therethru, an oil burner or the like for supplying heat to circulate thru said passages, said tank having a vent and a source of compressed air connected with the tank adapted to eject the contents thereof under pressure, and means for simultaneously closing the burner and vent and admitting compressed air to the interior of the tank.

5. In an apparatus of the character described, in combination, a tank having passages therethru, an oil burner or the like for supplying heat to circulate thru said passages, said tank having a vent and a source of compressed air connected with the tank adapted to eject the contents thereof under pressure, and means for simultaneously closing the burner and vent and admitting compressed air to the interior of the tank, said means comprising a three-way valve connected respectively with the oil supply, the source of compressed air and the vent.

6. In an apparatus of the character described, in combination, a support, a tank mounted thereon adapted to contain asphalt or the like, means for heating said tank, a source of compressed air communicating with the tank whereby the contents may be ejected under pressure, a vent leading from the tank, and means for simultaneously disconnecting the vent and heating means and connecting the source of compressed air with the interior of the tank.

7. In an apparatus of the character described, in combination, a support, a tank mounted thereon for containing asphalt or the like, means for heating the contents of said tank, distributing nozzles connected with the tank, a source of compressed air communicating with the tank for discharging the contents under pressure thru said nozzles, and a single means for simultaneously disconnecting the heating means from the tank and placing the source of compressed air in communication with the interior of the tank.

8. In apparatus of the character described, in combination, a support, a tank mounted thereon for containing asphalt or the like, means for heating the contents of the tank, a fuel reservoir mounted on said support, a fuel line from the reservoir to the heating means, a vent line to atmosphere from the tank, and means disposed in said fuel and vent lines operative to simultaneously open said lines.

9. In apparatus of the character described, in combination, a support, a tank mounted thereon for containing asphalt or the like, means for heating the contents of the tank, a fuel reservoir mounted on said support, a fuel line from the reservoir to the heating means, a vent line to atmosphere from the tank, and means disposed in said fuel and vent lines operative simultaneously to open and close said lines.

10. In apparatus of the character de-

scribed, in combination, a support, a tank mounted thereon for containing asphalt or the like, means for heating the contents of the tank, a compressed air reservoir mounted on the support, an air line from the reservoir to the tank, a fuel reservoir mounted on the support, a line from the fuel reservoir to the heating means, a vent line to atmosphere from the tank, and means disposed in said air, fuel and vent lines operative simultaneously to open the vent and fuel lines and to close the air line.

11. In apparatus of the character described, in combination, a support, a tank mounted thereon for containing asphalt or the like, means for heating the contents of the tank, a compressed air reservoir mounted on the support, an air line from the reservoir to the tank, a fuel reservoir mounted on the support, a line from the fuel reservoir to the heating means, a vent line to atmosphere from the tank, and means disposed in said air, fuel and vent lines operative simultaneously to open the air line and to close the fuel and vent lines.

12. In apparatus of the character described, in combination, a support, a tank mounted thereon for containing asphalt and the like, means for heating the contents of the tank, a compressed air reservoir mounted on the support, an air line from the reservoir to the tank, a fuel reservoir mounted on the support, a line from the fuel reservoir to the heating means, a vent line to atmosphere from the tank, a valve casing operatively disposed in the air, fuel and vent lines, and a valve in the casing operative simultaneously to open the fuel and vent lines and to close the air line.

13. In apparatus of the character described, in combination, a support, a tank mounted thereon for containing asphalt and the like, means for heating the contents of the tank, a compressed air reservoir mounted on the support, an air line from the reservoir to the tank, a fuel reservoir mounted on the support, a line from the fuel reservoir to the heating means, a vent line to atmosphere from the tank, a valve casing operatively disposed in the air, fuel and vent lines, and a valve in the casing operative simultaneously to open the air line and to close the fuel and vent lines.

Signed at Washington, District of Columbia, this 9th day of September, 1927.

CURTIS D. CHASE.

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