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HAND SPRAYING APPARATUS FOR BITUMINOUS MATERIAL.

APPLICATION FILED JULY 1, 1915.

1,197,745. Patented Sept. 12, 1916.

Fig. 1.

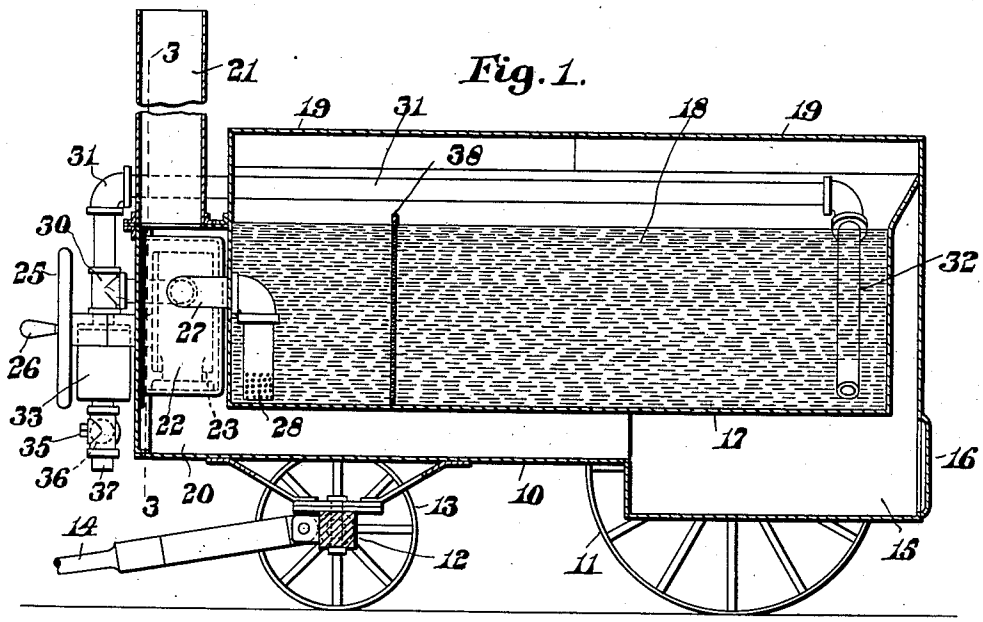


Fig. 2.

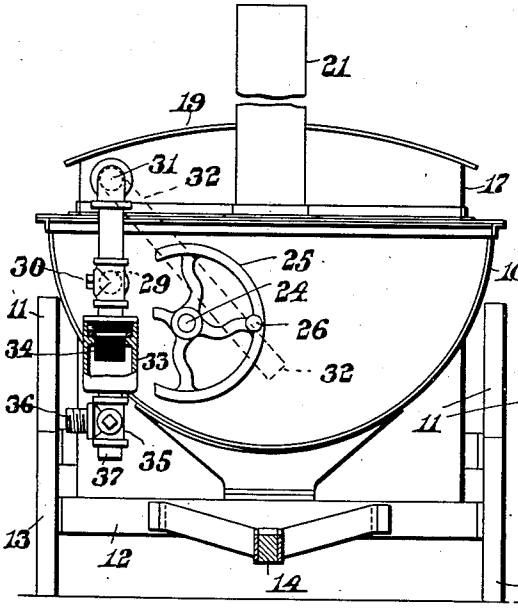
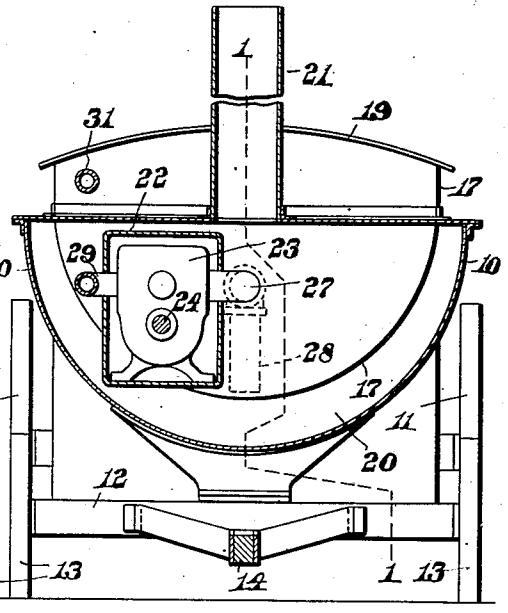


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HAND SPRAYING APPARATUS FOR BITUMINOUS MATERIAL.

1,197,745. Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed July 1, 1915. Serial No. 37,789.

To all whom it may concern:

Be it known that I, JUSTUS R. KINNEY, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Hand Spraying Apparatus for Bituminous Materials, of which the following is a specification.

This invention relates to an apparatus for spraying heated tar or asphalt by hand, and has for its object the provision of means for heating the material while circulating through a tank and then pumping said material from said tank through a hose over the surface of the road.

One of the main objects of the invention is to so locate the pump that it will be subjected at all times to hot gases in order that the material passing therethrough will not be permitted to harden and clog the working parts of the pump.

Another object of the invention is to provide a means whereby the material in the tank may be kept in constant circulation while being heated and reduced to a consistency adapted for spraying through a hose.

The invention consists in certain novel features of construction and arrangement of parts which will be fully understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents a longitudinal vertical section of an apparatus embodying the principles of the present invention. Fig. 2 represents an end elevation of the same, showing the strainer in section, and Fig. 3 represents a vertical transverse section on line 3—3 on Fig. 1.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 is a casing the rear of which has secured thereto the wheels 11 while the forward end is supported on an axle 12 having smaller wheels 13 at either end thereof. The axle 12 is provided with a pole 14 by which the apparatus may be moved about as desired. At the rear end of the casing 10 is a heating compartment 15, access to which is obtained by means of the door 16. Above the heating compartment 15 and within the casing 10 is a tank 17 adapted to be partially filled with a bituminous material 18, such as tar or asphalt, the covers 19 giving access to said tank. Between the outer walls of the tank 17 and the inner walls of the casing 10 is a hot air chamber 20, communicating at one end with the heating compartment 15 and at the opposite or forward end with a stack 21 through which the hot gases are adapted to escape. Between the forward end of the casing 10 and the forward end of the tank 17 is positioned a closed receptacle 22 in which is mounted a rotary pump 23, the shaft 24 of which extends through the front wall of the casing 10, and has mounted thereon a wheel 25 having a handle 26 secured thereto. By means of the handle 26 the pump may be manually operated. An inlet pipe 27 to said pump extends through the front wall of the tank 17 with its lower end provided with a perforated strainer 28. The outlet pipe 29 extends from said pump 23 to a valve 30. One branch of the valve 30 communicates with a circulating pipe 31 extending into the tank 17 and along the top thereof to the rear end of said tank, the rear end of said pipe 31 communicating with a downwardly extending pipe 32, the discharge end of which is at the bottom of said tank. The other branch of the valve 30 communicates with a strainer casing 33 in which is mounted a basket screen 34. The bottom of the casing 33 communicates with a three-way valve 35, one branch of which is provided with a threaded nipple 36 to which a spraying hose is adapted to be secured. The other branch 37 of the valve 35 is adapted to drain the strainer casing 33 when desired or may be used to draw off the material into buckets when desired. The apparatus is intended for use in patching or constructing streets and where the use of the more expensive horse drawn apparatus would be impracticable. In the use of the apparatus it is intended to provide the heat for melting the tar, asphalt, or other material in the tank 17 and reduce it to a proper consistency, by filling the heating chamber 15 with charcoal or some similar material and igniting the same. When the fire has been built in the heating compartment in this manner, the hot gases will pass through a chamber 20 and escape through the stack 21. The receptacle 22 is in the path of these hot gases and keeps the pump 23 therein heated at all times so that any material passing through the pump is kept in a hot liquid state and is

prevented from cooling and clogging the working parts of the pump. Heretofore, much difficulty has been experienced in handling on a small scale bituminous materials for spraying, and these difficulties are entirely overcome by the use of the apparatus herein described.

When the apparatus is in use, tar, asphalt, or similar material is placed within the tank 17, and the valve 30 turned to connect the pipe 29 with the pipe 31 and a fire is built in the heating chamber 15. As the bituminous material in the tank 17 becomes heated, the operator seizes the handle 26 and operates the pump 23. The melted material passing through the strainer 28 in its heated liquefied state will be pumped through the pipes 27, 29, and 31, and delivered into the bottom of the tank again from the discharge end of the pipe 32. By means of this operation a constant circulation of the material is provided and the entire mass is liquefied to a proper consistency for spraying. When this point has been reached the valve 30 is turned to cause the pipe 29 to communicate with the strainer casing 33, at the same time cutting off communication with the pipe 31. The operator continues to rotate the handle 26 and the material in the tank is pumped through the strainer 28, pipe 29, and strainer 33 to the nipple 36 from which it passes into the spraying pipe, this pipe being handled by another operator. By means of the pump 23 the required pressure at the spraying nozzles may be attained by hand power. By maintaining a constant circulation of the material in the tank 17 prior to the spraying operation, the overheating or coking of the material on the bottom of the heater is absolutely prevented.

Very often the bituminous material 18 used in the tank is delivered thereto mixed with foreign substances, and to prevent these foreign substances coming into contact with the strainer 28 of the inlet pipe 27, a perforated partition 38 is provided in the tank 17 extending upwardly above the level of the material as shown in Fig. 1. This partition 38 is located some little distance from the pipe 27 and effectively prevents any foreign substance from passing into the forward end of the tank where the pipe 27 is located.

It is believed that the operation and many advantages of this invention will be fully understood from the foregoing description.

Having thus described my invention, I claim:

1. In an apparatus of the class described, the combination of a tank; a casing forming a heating compartment below said tank and at one end thereof communicating with a stack at the opposite end by a hot air chamber extending along the outer wall of said tank; a pump in said chamber provided with an operating shaft extending outwardly through the wall of said casing; an inlet pipe for said pump extending into the bottom of said tank; a valved outlet pipe from said pump; and a circulating pipe extending laterally from said outlet pipe into said tank with its discharge end adjacent the bottom thereof whereby a constant circulation of the material in said tank may be maintained by said pump while said material is being heated.

2. In an apparatus of the class described, the combination of a tank; a casing forming a heating compartment below said tank and at one end thereof communicating with a stack at the opposite end by a hot air chamber extending along the outer wall of said tank; a pump in said chamber provided with an operating shaft extending outwardly through the wall of said casing; an inlet pipe for said pump extending into the bottom of said tank; means on the outside of said chamber casing for operating said pump; a valved outlet pipe from said pump; and a circulating pipe extending laterally from said outlet pipe into said tank with its discharge end adjacent the bottom thereof whereby a constant circulation of the material in said tank may be maintained by said pump while said material is being heated.

3. In an apparatus of the class described, the combination of a tank; a casing forming a heating compartment below said tank and at one end thereof communicating with a stack at the opposite end by a hot air chamber extending along the outer wall of said tank; a pump in said chamber provided with an operating shaft extending through the wall of said casing; an inlet pipe thereto extending into the bottom of said tank; a manually actuated device secured to said operating shaft outside of said casing for operating said pump; a valved outlet pipe from said pump; and a circulating pipe extending laterally from said outlet pipe into said tank with its discharge end adjacent the bottom thereof whereby a constant circulation of the material in said tank may be maintained by said pump while said material is being heated.

4. In an apparatus of the class described, the combination of a tank; a casing surrounding the sides and one end of said tank forming a hot air chamber; a stack communicating with one end of said chamber; a heating compartment at the opposite end of said chamber; a walled receptacle in said chamber, the walls of which are subjected to the heat in said chamber; a pump in said receptacle; means for operating said pump; an inlet pipe to said pump from the bottom of said tank; a valved outlet pipe from said pump; and a circulating pipe extending laterally from said outlet pipe into said tank with its discharge end adjacent the bottom

thereof whereby a constant circulation of the material in said tank may be maintained by said pump while said material is being heated.

5. In an apparatus of the class described, the combination of a tank; a casing surrounding the sides and one end of said tank forming a hot air chamber; a stack communicating with one end of said chamber; a heating compartment at the opposite end of said chamber; a walled receptacle, the walls of which are subjected to the heat in said chamber; a pump in said receptacle; means for operating said pump; an inlet pipe to said pump from the bottom of said tank; a valved outlet pipe from said pump; a circulating pipe from said outlet pipe to the interior of said tank; a strainer secured to said outlet pipe; and a three-way cock in the outlet of said strainer having two branches, one of which is provided with means whereby a hose may be secured thereto.

6. In an apparatus of the class described, the combination of a tank; a casing surrounding the sides and bottom thereof having a heating compartment at one end and an outlet stack at the opposite end and forming a chamber through which the hot gases pass from said compartment to said stack; a pump so positioned in said chamber as to be subjected indirectly to the heat of said gases; an inlet pipe to said pump from the bottom of said tank; an outlet pipe from said pump; a discharge pipe connected to said outlet pipe; and a circulating pipe also connected to said outlet pipe extending into the top of said tank and having its discharge end adjacent the bottom of said tank.

7. In an apparatus of the class described, the combination of a tank; a casing surrounding the sides and bottom thereof having a heating compartment at one end and an outlet stack at the opposite end and forming a chamber through which the hot gases pass from said compartment to said stack; a pump so positioned in said chamber as to be subjected to the heat of said gases; an inlet pipe to said pump from the bottom of said tank; an outlet pipe from said pump; a discharge pipe connected to said outlet pipe; a circulating pipe also connected to said outlet pipe extending into the top of said tank and having its discharge end adjacent the bottom of said tank; and a valve in said outlet pipe adapted to control the passage of material from said pump to either said discharge pipe or said circulating pipe.

8. In an apparatus of the class described, the combination of a tank; a heating compartment below said tank and at one end thereof communicating with a stack at the opposite end by a hot air chamber extending along the outer wall of said tank; a pump in said chamber; an inlet pipe thereto extending through the wall of said tank and downwardly therein with its mouth adjacent the bottom of said tank and at one end thereof; a valved outlet pipe from said pump; and a circulating pipe extending from said outlet pipe into the top of said tank with its discharge end adjacent the bottom of the opposite end of said tank whereby a constant circulation of all the material in said tank may be maintained by said pump throughout the interior of said tank while said material is being heated.

9. In an apparatus of the class described, the combination of a tank; a heating compartment below said tank and at one end thereof communicating with a stack at the opposite end by a hot air chamber extending along the outer wall of said tank; a pump in said chamber; an inlet pipe thereto extending through the wall of said tank and downwardly therein with its mouth adjacent the bottom of said tank at the stack end thereof; a valved outlet pipe from said pump; and a circulating pipe extending from said outlet pipe into the top of said tank with its discharge end adjacent the bottom immediately over the heating chamber whereby a constant circulation of all the material in said tank may be maintained by said pump throughout the interior of said tank while said material is being heated.

Signed by me at Boston, Mass., this 28th day of June, 1915.

JUSTUS R. KINNEY.

Witnesses:
WALTER E. LOMBARD,
NELLIE F. JONES.