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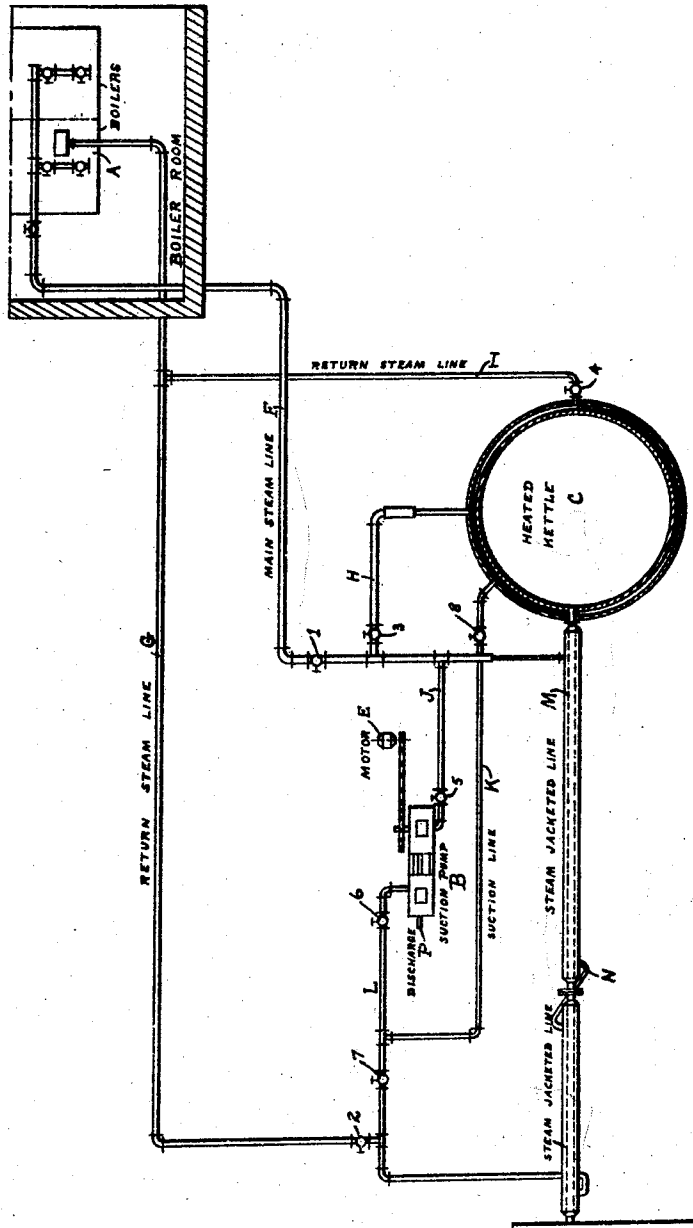
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METHOD AND MEANS FOR HANDLING HOT ASPHALT OR SIMILAR MATERIAL

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UNITED STATES PATENT OFFICE.

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METHOD AND MEANS FOR HANDLING HOT ASPHALT OR SIMILAR MATERIAL.

Application filed December 28, 1921. Serial No. 525,503.

To all whom it may concern:

Be it known that I, FRANK H. GILCHRIST, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented new and useful Improvements in Methods and Means for Handling Hot Asphalt or Similar Material, of which the following is a specification.

In the commercial utilization of asphalt and similar materials which are normally solid or nearly solid at atmospheric temperature, it is often desirable to pump the material through a pipe line to a point of use while liquefied by heat. In order to do this it has been proposed to maintain the pipe line heated by means of a steam jacket. While with this method the material within the pipe may be heated to a point where it is sufficiently liquid to be pumped, it is often much below the temperature needed for utilization. For example, in the manufacture of the so called asphalt shingles formed by impregnating paper felt with asphalt it is necessary to heat the asphalt to about 450° while steam at 150 pounds pressure has a temperature of only 365°. It will be apparent that if asphalt heated to 450° be pumped through a steam jacketed pipe the steam being at any temperature commercially practicable, the asphalt will be cooled to such an extent as to require reheating before it can be used. A pipe line carefully and thoroughly heat insulated will therefore be more satisfactory than a steam jacketed pipe with the plant in active operation, but should the asphalt in such a line be allowed to remain quiet long enough to cool it is evident that flow can not be reestablished without again heating the material therein.

For these reasons it is desirable to provide means for heating the pipe line to sufficiently liquefy the contents so that they may be pumped and then to depend on a heat insulation, the material to be pumped being hotter than steam in the heating jacket.

To provide for both conditions satisfactorily this invention provides a method and means by which the same elements are used for both purposes, at one time, as when starting the plant, to heat by steam, and at another time to act as a heat insulating jacket so that material hotter than the steam may be pumped without loss of heat thereto.

For this purpose the pipe line is jacketed as for steam and connections made thereto whereby the steam may be shut off, the jackets connected to a vacuum pump, and a vacuum, which is an efficient heat insulator, produced therein for the subsequent pumping operation. The kettle in which the material is heated may also be similarly jacketed, the jacket being initially supplied with steam to soften the material and then exhausted to produce a vacuum to prevent loss of heat as much as possible.

For a more complete understanding of this invention, together with further objects and advantageous details and combinations of parts, reference may be had to the accompanying drawing illustrating a layout of an asphalt plant employing the subject matter of this invention for the manufacture of asphalt shingles or the like.

Referring to this drawing at A is indicated a steam supply shown as consisting of a battery of boilers located within a suitable boiler room. At C is indicated the usual kettle in which the asphalt is heated, while at D is indicated a tank in which the felt is saturated with the hot asphalt. At M is indicated a pipe line connecting the kettle with the saturating tank, this line being jacketed so that steam from the boilers may be passed therealong or a vacuum produced thereabout as will be subsequently explained.

As shown the jacket of the line M is in two sections, these sections being connected together by a small pipe N. The jacket might be made in one section or more than two if desired. At B is shown a suction pump driven by a motor E. As shown the boilers are connected to one end of the steam jacket of the line M by means of a main steam line F, steam being returned to the boilers through a return steam line G. Valves at 1 and 2 in these lines may be employed to control communication of the steam jacketed line with the boilers. Between the valve 2 and the jacketed line is a suction pipe L communicating with the suction side of the pump B and having a valve 7 therein by which communication with this pump may be controlled. A second suction pipe J extends from the main steam line F to the pump, a valve 5 controlling this line.

As shown also the kettle C is jacketed, the pipe H leading thereto from the main steam line and having a control valve 3,

while a pipe I controlled by a valve 4 joins this jacket with the return steam line G. This jacket is also connected to the vacuum pump by means of a suction line K communicating with the suction line L, a valve 6 being interposed in the line L closely adjacent the pump. A valve 8 is also placed in this line adjacent the kettle C. The kettle C is heated in the usual manner as is well known in the art it being thought unnecessary to show such means in the drawing.

When the plant is to be started in operation the kettle C contains asphalt at substantially atmospheric temperature which is in a more or less solid state. The jacketed line M also contains more or less solid asphalt. Steam is first introduced by opening the valves 1, 2, and 3 so that the jackets in the line M and about the kettle become heated, whereupon the asphalt is liquefied. The kettle C, however, is heated by other means to a much higher temperature than the steam in the jacket. When the material is in the proper condition for pumping, the valves 1, 2, and 3 are closed, and the valves 4, 5, 6, 7, and 8 are opened. The pump D is then set in operation by means of the motor E, and the steam and air are sucked out of the jackets, such operation taking place through the line J to the jacketed line M and through part of line G and lines L and K to the pump, the exhaust of the pump being indicated at P. When this has been effected, a vacuum is maintained in the jackets which furnishes an effective heat insulation so that the hot asphalt may be pumped from the kettle C into the saturating tank and be sufficiently hot in the tank to be utilized without an additional heating operation.

As shown the jackets about the kettle C and the pipe line M may be separately manipulated to connect them as desired with either the vacuum pump or the steam supply. For example, steam may be admitted to the jacket about the kettle only, by opening valves 1 and 4 and closing valves 2 and 8, while this kettle jacket may be put in communication with the pump by closing valves 3 and 4, opening valve 8, closing valve 7 and opening valve 6, opening the suction to the suction line J, steam line H, the kettle jacket, suction line K and L to the pump. Likewise the jackets of line M only may be connected to the steam supply by opening valves 1 and 2 and closing valves 3, 4, 5, and 7, or to the pump by closing valves 1, 2, 3, and 8 and opening valves 5, 6, and 7. While no pump for forcing material through line M has been shown in the drawing, one may be used therein if desired or, in case the kettle and saturating tank are disposed conveniently for such action, gravity may be relied upon to convey the material.

Having thus described one embodiment of this invention it should be evident to those skilled in the art that many changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. The method of handling asphalt and similar materials which comprises heating the mass of material to a high degree, heating the material in a transmission pipe line leading from said means to a lower temperature to render it sufficiently fluid to flow therethrough, discontinuing the heating of said pipe line and heat-insulating the same, and causing the material to flow therethrough.

2. The method of handling asphalt and similar materials which comprises heating a mass of material in a receptacle from which a jacketed pipe line leads to a point of use, passing steam through said jacket to initially heat the material therein so that it may flow, then exhausting the steam and maintaining a vacuum in said jacket to heat-insulate said line, and causing the heated material to flow therethrough.

3. The method of handling asphalt and similar materials which comprises heating the material to a high degree, heating a transmission line to a lower temperature but above the melting point of the material, and then heat-insulating the line and causing said highly heated material to flow therethrough.

4. An apparatus of the class described comprising a receptacle in which the material may be heated, a receptacle in which the material may be used, a pipe line connecting said receptacles, a jacket about said line, a steam supply, a suction pump, and means whereby the steam supply and the pump may be placed selectively in communication with said jacket.

5. An apparatus of the class described comprising a steam jacketed kettle in which material may be heated, a saturating tank, a jacketed pipe line from said kettle to said tank, a steam supply, a vacuum pump, and means whereby the jackets of said kettle and pump may be individually and selectively connected to said steam supply and to said pump.

6. An apparatus of the class described comprising a system in which heated material is to be transported, means for heating said system, means for heating the material to a higher temparature than said system, and means for discontinuing the heating of said system and for insulating it against loss of heat.

In testimony whereof I have affixed my signature.

FRANK H. GILCHRIST.