This invention pertains to new and improved devices of a type commonly referred to as kettles for melting asphalt and various other materials.

For an extremely long period of time it has been known to apply asphalt and various other materials to various types of surfaces and bodies for purposes such as waterproofing and sealing. For virtually the same period of time it has been known that if asphalt is heated at a comparatively elevated temperature a tarry black-like residue is produced. This residue is comparatively difficult to remove from various items such as kettles within which asphalt is heated.

Because of the problem of the accumulation of residue from asphalt a number of different specialized types of heating equipment have been developed. Such equipment has been developed in an effort to provide devices of such a character that tarry residue could be removed therefrom with a minimum of difficulty. In developing such equipment it has been desired to provide devices of a comparatively small size capable of being used so as to heat asphalt or similar compositions to an elevated temperature in a comparatively short period.

Various types of apparatus utilizing a tank and utilizing a flame creating hot gases traveling in a housing around such a tank have been known for years. Because of heating efficiency as well as other problems in comparatively recent years several different devices have tended to replace this type of jacketed heating vessel. As a general rule, such newer devices have employed so-called immersion type heaters consisting of a series of interconnected pipes adapted to be immersed in a kettle containing asphalt from the top of such a kettle. These prior immersion heaters have been reasonably effective for the purposes intended, but they are not considered to be completely acceptable because they occupy a significant amount of area at the top of an asphalt kettle and because of problems in effectively and rapidly heating a composition such as asphalt. Also prior immersion heaters as indicated are considered comparatively objectionable from the standpoint of initial cost and from the standpoint of fuel consumption.

An object of the present invention is to provide new and improved kettle-type devices for heating asphalt and similar compositions such as are commonly referred to as compounds. Another objective of this invention is to provide new and improved devices which overcome many of the limitations and disadvantages of prior art structures such as are briefly indicated in the preceding discussion. A still further object of the present invention is to provide new and improved asphalt and compound heating kettles which may be manufactured at a comparatively nominal cost, which are effective in rapidly and inexpensively heating a quantity of asphalt to a temperature at which this material may be used, and which may be easily and conveniently disassembled for cleaning purposes in order to remove tarry residue and the like.

These and various other objects of this invention as well as many specific advantages of it will be more fully apparent from a detailed consideration of the description including the appended claims and the accompanying drawing in which:

FIG. 1 is a top plan view of asphalt and/or composition heating kettle of this invention;

FIG. 2 is an end elevational view taken in the direction of the arrow 2 in FIG. 1;

FIG. 3 is a cross-sectional view taken at line 3—3 of FIG. 1; and

FIG. 4 is a cross-sectional view taken at line 4—4 of FIG. 1.

The accompanying drawing is primarily intended so as to clearly illustrate a presently preferred embodiment or form of this invention. From a consideration of this specification it will be realized that this invention is not to be considered as being limited by this drawing inasmuch as the principles of this invention can be embodied within differently appearing kettles for heating asphalt and similar ingredients or compositions which differ from the specific heating kettle shown through the use or exercise of routine engineering skill or ability.

As an aid to understanding this invention it can be stated in essentially summary form that it concerns heating kettles of the type indicated in the preceding, each of which includes an end wall, a bottom and an open top. In accordance with this invention a heating structure is mounted on such an end wall so as to extend through the interior of the kettle between the top and the bottom of it and so as to be spaced from both the top and bottom of the kettle.

This heating structure preferably includes a centrally located burner pipe extending across the kettle from the end of it, a distributing manifold in communication with the burner pipe and flue pipes connected to this manifold. These flue pipes are, in accordance with this invention, located so as to extend through the kettle between the top and bottom of it and then extend upwardly out of the kettle through the open top adjacent to the end upon which the centrally located burner pipe is mounted. With this construction a conventional heater consisting of a device adapted to burn a combustible fuel may be inserted located adjacent to an opening in the end wall into the burner pipe so as to cause a flame producing hot gases which pass through the burner pipe, the manifold and then through the flue pipes to the atmosphere.

The actual details of this invention will be more fully apparent from a detailed consideration of the accompanying drawing. Here there is shown a complete asphalt and composition heating kettle 10 of the present invention which includes a kettle or tank 12. This tank 12 has an open top 14, side walls 16 and a curved bottom wall 18 having a cylindrical shape. The side walls 16 and the bottom wall 18 are joined by end walls 20 and 22. The end wall 20 is provided with a centrally located hole 24. Preferably a ring 26 is secured to this wall 20 about the hole 24 so that the interior of it coincides with the interior of the ring 26. The ring 26 may be conveniently secured in place by welding or various other similar operations.

In the tank 12 a cylindrical burner pipe 28 is mounted upon the end wall 20 through the use of a terminal flange 30 which is secured to an end of this pipe 28. The flange 30 preferably is of substantially the same dimension as the ring 26. On its exterior it may be provided with a continuous exterior shoulder 32 which holds the burner pipe 28. When the shoulder 32 is employed, the burner pipe 28 may be attached to the flange 30 by welding or similar techniques. Both the ring 26 and the flange 30 contain a plurality of holes 34 which are spaced equi-distant from one another. These holes 34 are adapted to hold common bolts 36 which are used for clamping the flange 30 and the ring 26 against an appropriate conventional gasket 38 employed for sealing purposes.

The extremity of the burner pipe 28 remote from the end wall 20 is preferably secured in a known manner to approximately the midpoint of a side 39 of a box-like distributing manifold 40 extending parallel to the top 14. On the side 39 this manifold 40 carries attached identical flue pipes 42, each of which has a cylindrical
bottom section 44 which extends parallel to the burner pipe 28 and a connected vertically extending section 46 which is spaced from the end wall 20 so as to extend up out of the tank 12 through the top 14. The flue pipes 42 are spaced approximately equi-distant from the burner pipe 28.

Preferably these sections 46 are secured as by welding to a top cover plate 48 serving to stabilize them against undesired movement and serving to partially cover the open top 14 so that when the remainder of this top 14 is covered by a conventional lid (not shown) water cannot get into the interior of the tank 12. If desired, various other or the like of a conventional nature (not separately numbered in the drawings) may be secured to the vertical sections 46 and/or to the cover plate 48 so as to support the extremities of the flue pipes 42 against bending or undesired movement.

During the use of the complete asphalt and composition melting kettle 10 an appropriate burner 50 as shown in phantom in FIG. 1 and FIG. 4 of the drawing may be located opposite the hole 24 so as to direct a flame of hot gas (not shown) into the burner pipe 28. Efficient operation of the burner 50 is achieved by spacing it from the wall 20 as shown. The burner 50 causes a flame of hot gas to be created which extends through a part of the burner pipe 28. Such a flame, of course, turns into a stream of hot exhaust gas which travels from this burner pipe 28 into the manifold 40. In this manifold 40 such hot gases are divided into two approximately equal streams. Each of these streams travels through one of the flue pipes 42 and then out into the atmosphere. During such time as the heat is being applied to the interior of the kettle 10 in this general manner asphalt or whatever is being heated within this kettle is, of course, heated by heat traveling through the walls of the pipe 28, the manifold 40 and the flue pipes 42. As a result of this heat a number of different convection currents are set up within the material within the tank 12, and these currents cause such material to flow to some extent within this tank so that the contents of it rapidly and efficiently become heated to a comparatively uniform temperature.

As a result of this heating, material within the tank 12 will normally break down or change chemically so as to deposit around the pipes 28 and 42 and the manifold 40 a rather thick deposit of material which can be most appropriately referred to as “gunk.” This type of tarry residue will also tend to accumulate on the interior walls of the tank 12 and in particular upon the bottom wall 18. As a result of this accumulation of material the heat transfer within the kettle will, of course, be less efficient than if such a deposit were not present.

One of the major advantages of the present invention lies in the ease with which the complete apparatus may be disassembled in order to remove these deposits. In order to disassemble this apparatus it is only necessary to unfasten the bolts 36 and to lift the assembly consisting of the burner pipe 28, the manifold 40 and the flue pipes 42 from the tank 12. Because of the fact that there are no projecting shoulders, flanges or the like which extend from the burner pipe 28 or any of the other parts which are removed during this operation even comparatively thick or heavy deposits within the tank 12 do not interfere with such removal. If desired, a handle like hook 52 may be secured to the manifold 40 in order to enable such removal to be accomplished through the use of an appropriate hoist.

The removal of the assembly consisting of the burner pipe 28, the manifold 40 and the flue pipe 42 is very easily accomplished with the type of construction shown in the accompanying drawing and described in the preceding portions of this specification. It will be realized that the smooth exterior of the burner pipe 28 utilized is important in such removal inasmuch as it is virtually impossible for various deposits to effectively interfere with this burner pipe being pulled out of the kettle 12. It will be further realized that with the construction shown the bolts 36 are located interiorly of the burner pipe 28 where these bolts cannot be covered by deposits such as normally accumulate within the kettle 12 during use of the complete asphalt and composition melting kettle 10. Further, these bolts 36 are located in the kettle 12 where they are always accessible with a minimum amount of difficulty through the hole 24 in the end wall 20.

After the complete asphalt and composition melting kettle 10 has been disassembled for cleaning purposes as indicated in the preceding discussion and has been cleaned this complete kettle may be reassembled by simply reversing the series of operations employed in disassembling it. Thus, in reassembling the complete kettle 10 the assembly consisting of the burner pipe 28, the manifold 40 and the flue pipes 42 is located within the kettle 12 so that the ring 26 is directly opposite the flange 50 and so that the gasket 38 is located between these latter two parts. While this assembly is held in place the bolts 36 may be easily fastened through the use of conventional wrenches. At this point the entire asphalt and composition melting kettle 10 is ready again for use.

Because of the nature of this invention it will be realized that various changes by routine engineering nature may be made in the precise kettle 10 shown in the accompanying drawing and described herein. For this reason this invention is to be considered as being limited solely by the appended claims forming a part of this specification.

We claim:

1. An asphalt and composition melting kettle which includes:

a tank structure having a curved bottom wall of a cylindrical shape and extending upwardly from the sides of said bottom wall and end walls extending upwardly from the ends of said bottom wall, said side walls and said end walls being joined together, one of said end walls having an opening formed therein, said opening being located so as to be spaced from the edges of said end wall; ring means secured to said end wall so as to extend around the interior of said opening, said ring means being accessible from the outside of said tank structure;

b a heating assembly located within said tank structure so as to extend between said side walls, said heating assembly including a horizontal cylindrical burner pipe having a smooth exterior, an internal flange means attached to one end of said burner pipe, said flange means being of the same diameter as said ring, distributing manifold, one side of said manifold being connected to and open to the interior of the end of said burner pipe remote from flange means, flue pipe means attached to said side of said manifold, said flue pipe means being in communication with the interior of said manifold and each having a cylindrical bottom section located parallel to said burner pipe and a vertically extending section located remote from said manifold and positioned adjacent to and spaced from said end wall, said vertical sections extending out through the top of said structure, said horizontal sections being spaced equi-distant from said burner pipe, all of said heating assembly being spaced from said bottom wall;

gasket means located between said ring means and said flange means;

a plurality of bolt means extending from the interior of said burner pipe through said flange means, said gasket means and said ring means and removable therefrom, said bolt means holding said heating assembly on said end wall of said tank structure.
2. An asphalt and composition melting kettle which includes:
a tank structure having a curved bottom wall of a cylindrical shape, side walls extending upwardly from the sides of said bottom wall and end walls extending upwardly from the ends of said bottom wall, said side walls and said end walls being joined together, one of said end walls having an opening formed therein, said opening being located so as to be spaced from the edges of said end wall;
ring means secured to said end wall so as to extend around the interior of said opening, said ring means being accessible from the outside of said tank structure;
a heating assembly located within said tank structure so as to extend between said side walls, said heating assembly including a horizontal cylindrical burner pipe having a smooth exterior, an internal flange means attached to one end of said burner pipe, said flange means being of the same diameter as said ring, distributing manifold, one side of said manifold being connected to and open to the interior of the end of said burner pipe remote from flange means, flue pipe means attached to said side of said manifold, said flue pipe means being in communication with the interior of said manifold and each having a cylindrical bottom section located parallel to said burner pipe and a vertically extending section located remote from said manifold and positioned adjacent to and spaced from said end wall, said vertical sections extending out through the top of said tank structure, said horizontal sections being spaced equi-distant from said burner pipe, all of said heating assembly being spaced from said bottom wall;
gasket means located between said ring means and said flange means;
a plurality of bolt means extending from the interior of said burner pipe through said flange means, said gasket means and said ring means and removable therefrom, said bolt means holding said heating assembly on said end wall of said tank structure;
stabilizer means connected to said vertical extending sections of said flue pipe means for holding said flue pipe means against undesired movement; and
hook means secured to said manifold.

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