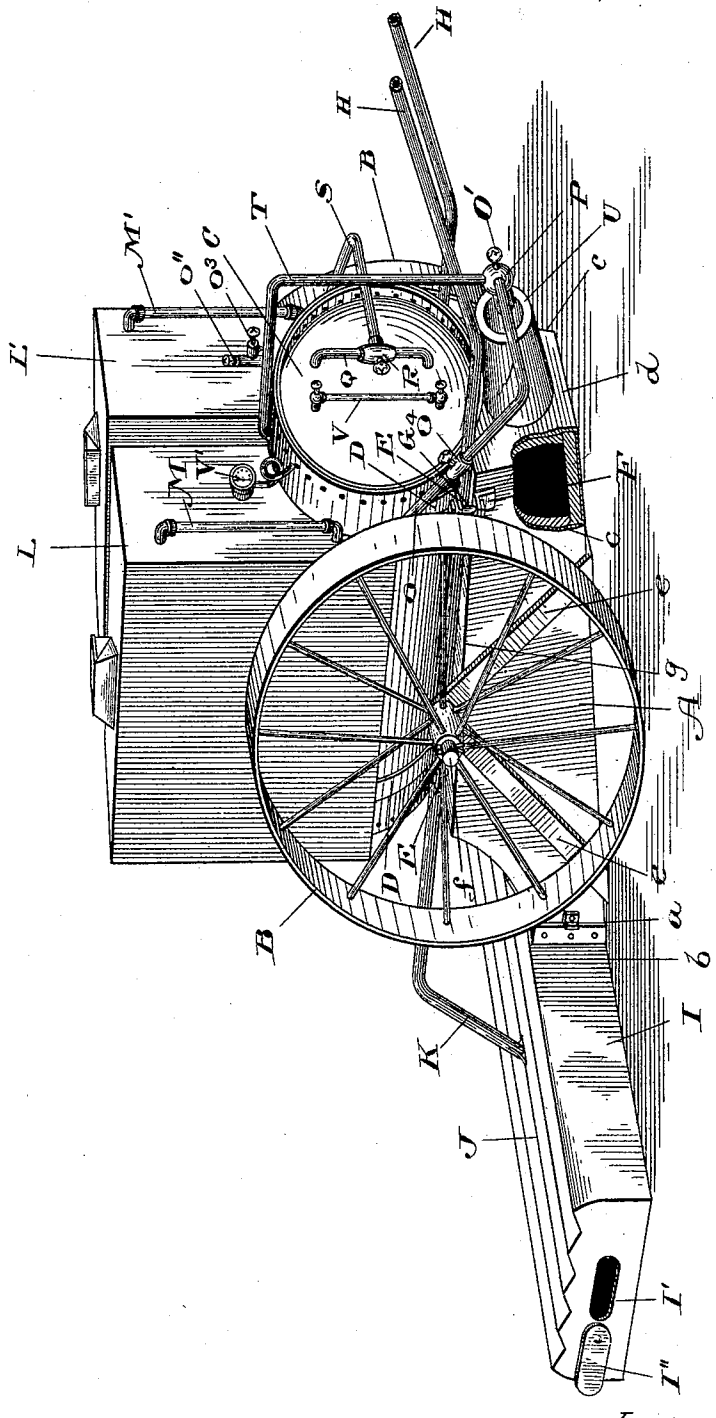
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W. G. MacKENDRICK.

APPARATUS FOR REPAIRING ASPHALT PAVEMENTS.

(Application filed Dec. 22, 1897.)

(No Model.)



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APPARATUS FOR REPAIRING ASPHALT PAVEMENTS.

SPECIFICATION forming part of Letters Patent No. 616,001, dated December 13, 1898.

Application filed December 22, 1897. Serial No. 663,092. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. MACKENDRICK, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Apparatus for Repairing Asphalt Pavements; and I hereby declare that the following is a full, clear, and exact description of the same.

Heretofore in repairing asphalt pavements by means of blasts of flame from oil-burners or from ignited gas, &c., it has been found necessary in order to obtain the best results to have the hood under which the flame is generated open at the end opposite to where the flame is introduced and to have a number of air-openings to admit sufficient air to keep the flame well supplied with oxygen. These openings for the admission of cold air under the hood were either at the end where the flame was introduced or at the side and extended nearly around the bottom of the hood. The disadvantage of introducing cold air from either the sides or ends direct into the hood, where excessive heat is required, is self-evident. So, also, is the arrangement of having the escape for the flame directly opposite the end where the flame is introduced and of almost as large an area as the other sections of the hood. It has been found in practice that the flame, if thrown rapidly across the portion of the pavement to be heated, escapes before its heating power has been fully utilized. In those machines provided with burners having a number of small openings for the outlet of the gas or oil it is found that when the cheaper crude oils are used the excessive heat causes the numerous small outlets to be filled with coke, and when contained within the hoods considerable time is lost in removing the coke obstructions, and when the oil-pipe is contained within a highly-superheated steam-pipe considerably more time is required to remove any obstructions. If gasolene or other of the highly-volatile oils are used, (which are freer from coking impurities,) the cost of heating the pavement is greatly increased. In those existing machines where steam is not used the flame cannot be regulated to the nature of the pavement to be heated—that is, the flame in that style of a machine would be of the same size and temperature where the pavement was old and hard and requiring great heat or new and soft and requiring but little heat to do the work. In those machines a medium-sized hood required several different outlets for the oil or gas generated from the oil, and the flame being thrown quickly across the pavement and allowed to escape at the outer end consumed an unnecessarily large quantity of oil and rendered the work exceedingly expensive. In the case of these machines the escape of the flame is necessary in order that a suction can be created to draw sufficient air into the hood to keep the gas or oil burning. In those machines where superheated steam is used a boiler, smoke-stack, and separate coal or other fuel fire has to be maintained solely for the purpose of generating steam, which requires special attention on the part of the operator, and in addition special facilities have to be arranged to carry this supply of fuel. The hood in this class of machine has the outlet extending across the outer end, and the flame when thrown across the pavement escapes and burns an irregular patch of pavement at the outer end unless special means are taken at each patch to protect the pavement at that point. These various methods and the use of the apparatus heretofore employed have been found quite expensive to operate, in addition to the many inconveniences and difficulties connected with their operation.

To obviate the objectionable features of the numerous minute outlets for the oil or gas burned within the hood and to prevent them clogging up and delaying the progress of the work is part of the object of the present invention, which is accomplished by having a single oil-outlet made large enough to not clog and placed entirely outside and at a distance from the hood.

Another object of the invention is to dispense with the use of superheated steam, a separate fire to generate the steam, incandescent fuel and vapor burners or hoods open at the end opposite to where the flame is introduced, and instead thereof to use ordinary

live steam with the cheapest quality of fuel-oil, which is discharged through an ordinary fuel-oil burner into the outer end of a combustion-chamber, where the oil is atomized and ignited and discharged into a hood closed at the opposite end to where the flame is introduced, so that the flame can be held in close contact with the pavement until thoroughly consumed, as hereinafter fully set forth, and more particularly pointed out in the claims.

In the drawing the figure represents a perspective view of the complete apparatus or machine for repairing asphalt pavements.

Like letters of reference refer to like parts throughout the specification and drawing.

A represents the fire-box or combustion-chamber, which is provided with an open end *a* and open bottom *b*. The fire-box or combustion-chamber A is of any suitable size and shape and is provided with closed sides *c c* and end *d* opposite the end *a*. Bolted or riveted to each of the sides *c c* are two braces or stays *e e*, and connected to the top of the stays *e e* are the axle-arms *f*. Mounted on the axle-arms *f* are the carrying-wheels B B. Supported on the top *g* of the fire-box or combustion-chamber A is a boiler C, and that part of the top *g* of the fire-box or combustion-chamber A immediately below the boiler C is open in order that the products of combustion within the fire-box A can act directly upon the under side of the boiler C. Bolted to the outer side of the boiler C are a series of straps D D, having horizontal lugs E E. Connected to the outer side of the fire-box or combustion-chamber A are lugs F, located near the front of the fire-box or combustion-chamber, and connected to the inner side of the fire-box or combustion-chamber A, at or near the back, are similar lugs. Passing through the lugs E E and the lugs F are bolts G G, by means of which the boiler C is rigidly bolted to the top of the fire-box or combustion-chamber A.

H H represent the handle-bars, which are connected to the top of the fire-box or combustion-chamber A by being placed between the lugs E E and the top *g* of the fire-box, the bolts G G and lugs E E serving to clamp the handle-bars H H to the top *g*. The fire-box or combustion-chamber A projects beyond the rear of the carrying-wheels B B and is provided with an extension I from the back of one of the sides *c*. The side *c* adjacent to the extension I is provided with an opening into the extension in order that the products of combustion can pass from the fire-box or combustion-chamber A into the extension I. The sides, outer end, and top of the extension I are completely closed in order that the heat and fire may be confined within the extension. The bottom of the extension I is open in order that the heat and fire confined within it may be directed upon the pavement. To obtain the best results from the heat within the extension I, it is found advisable to corrugate the under side of the top J of the extension I to radiate the heat on the pavement.

The handle-bars H H are provided with downward extensions K, connected to the top of the fire-box or combustion-chamber A to carry the fire-box and the extension I.

L L′ represent two tanks mounted on the boiler C. The tank L is arranged to contain oil, while the tank L′ is arranged to contain water. The tank L is provided with a gage-glass M, while the tank L′ is provided with a gage-glass M′. Fitted to the bottom of the tank L is a supply-pipe O to convey the oil from the tank L to the burner P, set opposite the middle of the front of the fire-box or combustion-chamber A. The supply-pipe O is provided with a valve O^4, by means of which the passage through the pipe can be opened or closed.

Connected to the steam-space of the boiler C is the top end of a pipe Q, the lower end of which is connected to the lower part of the water-space of the boiler. The pipe Q is provided with an injector R, having a coupling to receive the end of a pipe S, connected to the tank L′. Leading from the steam-space of the boiler C to the valve O′ of the burner P is a steam-pipe T, by means of which the steam is conveyed from the steam-space of the boiler to the burner and then into the combustion-chamber.

The purpose of the valve O′ is twofold—first, to form the coupling between the steam and oil pipes and the burner, and, second, to regulate the volume of flame. Opposed to the burner P and connected to the front of the fire-box A is a funnel-shaped entrance U, diverging from the burner to the fire-box, for the purpose of establishing an entry for the flame into the fire-box. The front of the boiler C is provided with a water-gage V and the top is provided with a steam-gage V′.

The operation of the device is as follows: Oil is placed in the tank L and water in the tank L′. Water is fed from the tank L′ to the boiler C, where steam is generated and conveyed by means of the pipe T to the valve O′ of the burner P. The valve on the supply-pipe O is opened to permit of the passage of the oil from the tank L to the valve O′. The steam and oil in the valve O′ are discharged into the funnel-shaped entrance U of the combustion-chamber. The flame passes from the burner P through the collar U into the fire-box or combustion-chamber A and from the combustion-chamber A into the extension I. The sides and ends of the fire-box and extension being closed, the fire is necessarily confined within them and directed upon the portion of the pavement to be heated. By this means all risk and danger of accident resulting from the outlet of the flame through the ends of the fire-box is avoided. The boiler is fitted with an ordinary safety-valve O″ and blow-off pipe O^3. In the end of the

extension I is an opening I′, closed by a pivoted door I″.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus or machine for repairing asphalt pavements consisting of a combustion-chamber having an open bottom and its sides, end and top closed, a burner on the outer side of the combustion-chamber, an opening through the side or end of the combustion-chamber opposed to the burner, means for feeding the burner with fuel, and forcing the flame through the opening into the combustion-chamber, and an extension for the combustion-chamber, having an open bottom and its sides, end and top closed, the under side of the top of the extension being corrugated, and an opening from the combustion-chamber into the extension, substantially as specified.

2. An apparatus or machine for repairing asphalt pavements consisting of a fire-box having an open bottom and closed sides, end and top, a boiler supported on the fire-box, one side or end of the fire-box having an opening, a burner on the outer side of the fire-box opposed to the opening, a valve fitted to the burner, oil and water tanks, a connection between the oil-tank and the valve, a connection between the steam-space of the boiler and the valve, and a connection between the water-tank and the boiler, substantially as specified.

3. An apparatus or machine for repairing asphalt pavements consisting of a fire-box having an open bottom and closed sides, end and top, a boiler supported on the fire-box, one side or end of the fire-box having an opening, a burner on the outer side of the fire-box opposed to the opening, a valve fitted to the burner, oil and water tanks, a connection between the oil-tank and the valve, a connection between the steam-space of the boiler and the valve, a connection between the water-tank and the boiler, an extension from one of the sides of the fire-box having an open bottom, and the under side of the top corrugated and having closed sides and ends, and an opening into the fire-box, substantially as specified.

4. An apparatus or machine for repairing asphalt pavements consisting of a fire-box having an open bottom and closed sides, end and top, a boiler supported on the fire-box, one side or end of the fire-box having an opening, a burner on the outer side of the fire-box opposed to the opening, a valve fitted to the burner, oil and water tanks, a connection between the oil-tank and the valve, a connection between the steam-space of the boiler and the valve, a connection between the water-tank and the boiler, and carrying-wheels and handle-bars connected to the fire-box, substantially as specified.

5. An apparatus or machine for repairing asphalt pavements consisting of a fire-box having an open bottom and closed sides, end and top, a boiler supported on the fire-box, one side or end of the fire-box having an opening, a burner on the outer side of the fire-box opposed to the opening, a valve fitted to the burner, oil and water tanks, a connection between the oil-tank and the valve, a connection between the steam-space of the boiler and the valve, a connection between the water-tank and the boiler, an extension from one of the sides of the fire-box having an open bottom, and the under side of the top corrugated and having closed sides and ends, an opening into the fire-box, and carrying-wheels and handle-bars connected to the fire-box, substantially as specified.

6. An apparatus or machine for repairing asphalt pavements consisting of a combustion-chamber fitted with a burner to heat the pavement, and a boiler supported by the combustion-chamber and heated by the flame from the burner, substantially as specified.

Toronto, October 29, A. D. 1897.

W. G. MacKENDRICK.

In presence of—

C. H. RICHES,

MAUDE A. WESTWOOD.