

(No Model.)

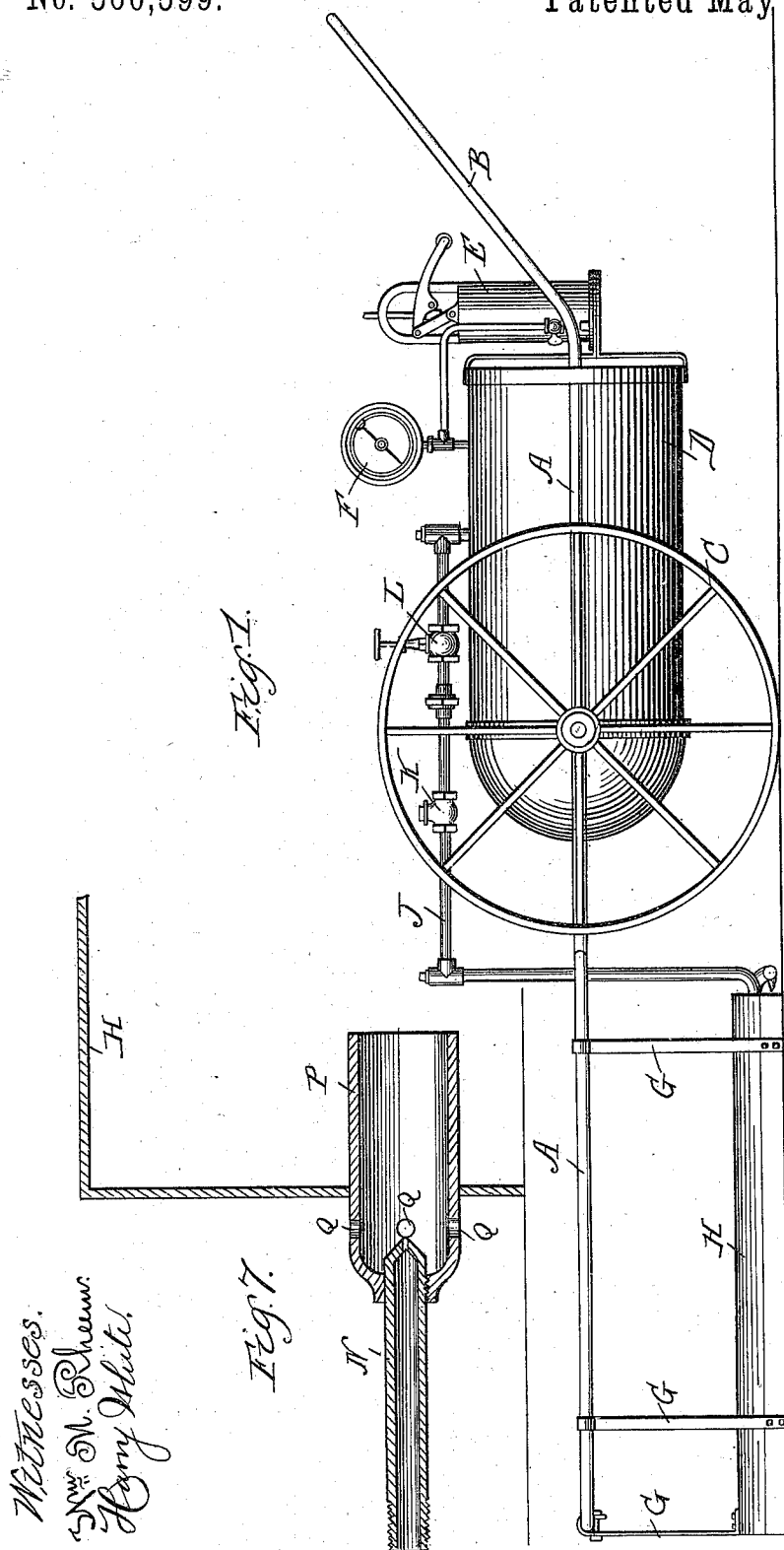
2 Sheets—Sheet 1.

A. H. PERKINS.

APPARATUS FOR REPAIRING ASPHALT PAVEMENTS.

No. 560,599.

Patented May 19, 1896.



Witnesses:
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Harry White.

Inventor
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by Raymond S. Quinlan Atty's

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2 Sheets—Sheet 2.

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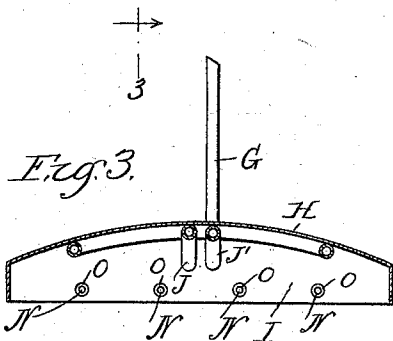
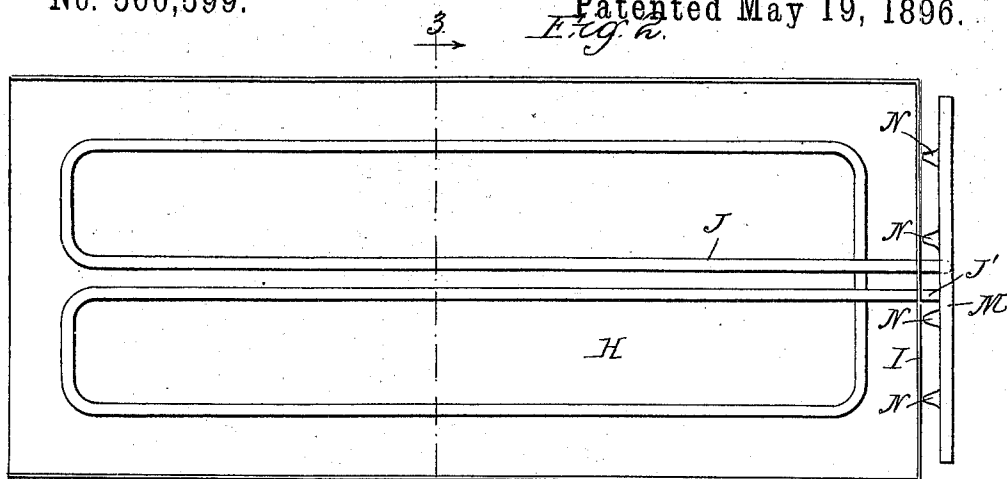


Fig. 4.

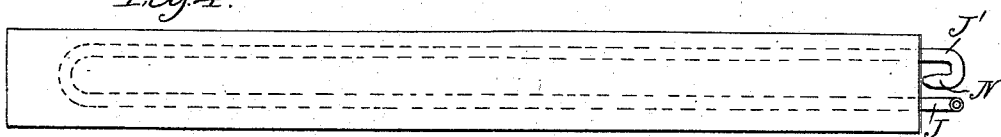


Fig. 5.

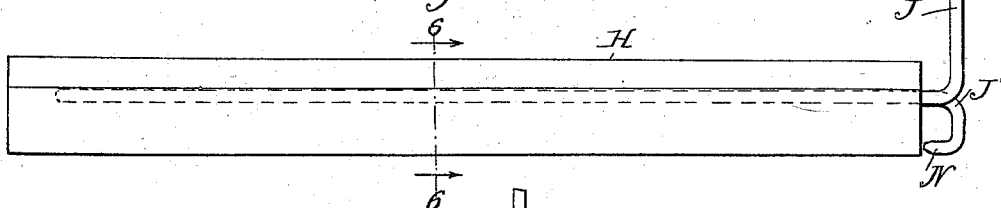
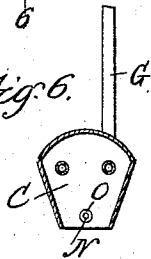


Fig. 6.



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UNITED STATES PATENT OFFICE.

AMOS H. PERKINS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE UNITED STATES REPAIR AND GUARANTY COMPANY, OF SAME PLACE.

APPARATUS FOR REPAIRING ASPHALT PAVEMENTS.

SPECIFICATION forming part of Letters Patent No. 560,599, dated May 19, 1896.

Application filed June 15, 1895. Serial No. 552,908. (No model.)

To all whom it may concern:

Be it known that I, AMOS H. PERKINS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Repairing Asphalt Pavements, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in apparatus for repairing asphalt pavements, and is more especially designed as an improvement upon inventions set forth in Letters Patent of the United States No. 501,536, granted July 18, 1893, and No. 517,191, granted March 17, 1894. In said patents are shown blasts of flame or superheated air directed vertically upon the pavement and under hoods designed to confine the heat to the part of the pavement intended to be repaired. I have found by practice that while such an apparatus is thoroughly effective in accomplishing the desired result it is open to the objection that the heat, under the influence of the strong blast and winds, will escape around the edges of the hood, and thus soften more of the old pavement than is desired, thereby increasing the labor and cost of repair. This objection is particularly prominent when it is desired to repair narrow cracks in the pavement, and as the hood of these prior machines cannot rest directly upon the ground, so as to confine the heat to the limits thereof without smothering or objectionably reducing the flame-jets, this objection cannot be overcome in the class of machines in which hooded burners are employed. A further and more serious objection, developed by practice, is the burning out of the valves of the numerous burners necessarily employed, which even the shields cannot effectively protect against the intense heat to which they are subjected except for but a short time, and, furthermore, it is necessary with such burners to employ a high grade of gasolene or naphtha. The prime object of this invention is to overcome all of these objections by dispensing with all valved burners and by delivering the heat to the surface to be repaired by horizontal instead of vertical blasts.

Another object is to enable the confinement of the heat to the limits of the hood and thereby avoid the objection incident to the heating of the unworn pavement beyond the limit of the hood.

These and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of an apparatus embodying my invention. Fig. 2 represents an inverted plan view of a hood and its connected pipes and burners employed in surface repairing. Fig. 3 represents a transverse vertical section thereof on the line 3 3 of Fig. 2. Fig. 4 is a plan view of a hood and its pipe and burner connections designed for use in repairing cracks. Fig. 5 is a side elevation thereof. Fig. 6 is a transverse vertical section of the same on the line 6 6 of Fig. 5, and Fig. 7 is a detail section illustrating a modification of the burner-nozzle.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A represents a frame of any suitable construction, terminating in or provided with a handle B and mounted upon ground-wheels C for the purpose of portability. Mounted in this frame in any suitable manner is a tank D, to which is applied an air-pump E and a pressure-gage F. All of the features so far described are common to the patents previously granted to me and do not require any more detailed illustration or description.

Suspended from the frame A upon suitable hangers, such as G, is a hood H, of a substantially inverted-U shape, as more clearly illustrated in Fig. 3, but closed at one end by the end wall or partition I (preferably the end nearer the tank) and open or practically unobstructed at its opposite forward end. Leading from the tank to the hood is a supply-pipe J, preferably having a cock-valve K for entirely shutting off or turning on the supply of fuel, and also a hand-valve L, which is provided as a temporary control for the supply of fuel to the burners during the use of the machine, being readily adjusted by hand

through the medium of a hand-wheel or any other convenient device.

The supply-pipe passes into the hood through the end wall I thereof, as more clearly illustrated in Figs. 2 and 3, and is suitably coiled or bent and disposed under the roof of the hood, to which it is attached by suitable fastening devices, so as to be exposed to the heat under the hood. The end J' of the supply-pipe passes out through the end wall I and has applied thereto a cross or transverse pipe M of a length substantially corresponding with the width of the hood, which cross-pipe is provided with a series of permanently open nozzles N, disposed opposite to perforations O in the end wall I of the hood and preferably as near as practicable to the bottom edge of the hood. These nozzles N may be of any desired character, so long as they are adapted to subserve the purpose of an open burner, and in point of fact it would be only necessary to have short lengths of pipe screwed into the pipe M and flatten the ends of such pipes in order to produce a satisfactory burner. While in practice I have found that the burners disposed, as illustrated in Figs. 1, 2, and 3, entirely outside of the hood and otherwise unprotected are practically satisfactory, in high winds it may prove desirable to have the burners protected by some such caps as that illustrated in Fig. 7, which caps are simply short castings or pipe-sections P screwed onto, or otherwise attached to, the nozzles N and passing through the end wall I of the hood. Outside of the hood the castings are provided with a sufficient number of openings Q to supply the necessary amount of oxygen to the burners.

The hood and its accompanying burners and supply-pipe (illustrated in detail in Figs. 2 and 3) is designed primarily as a "surface" heater for heating surfaces of considerable area where large patches are to be applied to the asphalt pavement; but in Figs. 4, 5, and 6 I have illustrated a narrow-hooded construction, in all general respects like the broader hood, but especially designed for the repairing of cracks or very narrow sinks in the pavement. In this narrow hood but a single burner is necessary, although more may be used; but where a single burner is employed it is either applied directly to the end J' of the supply-pipe, or, as shown in the drawings, the end of the supply-pipe itself constitutes the burner, being flattened or contracted for that purpose and arranged to register with the perforation O in the end wall of the hood, or may be supplied with a protecting-cap, as in Fig. 7. In both of these forms of heaters, which of course may be varied to any desired extent, jets of flame are delivered to the hood at one end thereof and pass along under the hood out of the forward open end thereof, thus serving to heat that portion of the pavement covered by the hood in its passage through the hood. To insure the heating of only so much of the pavement

as is covered by the hood the hood may be allowed to rest directly on the pavement, which cannot be done with hoods wherein vertically-disposed blasts are employed, and as the ground, in conjunction with the hood, in point of fact, constitutes a horizontal flue for the heat or flame jets, even though the hood does not snugly fit the surface of the ground, there will be a tendency to draw air in at the side edges of the hood rather than to expel the heat out from under the side edges. I have found by practical demonstration that a space of at least a half-inch may occur between the lower edges of the hood and the pavement without any of the heat escaping therefrom at the sides, and consequently even in the "crack" heater the heat is absolutely confined to the limits of the hood and all objections to the heating of the pavement beyond the hood are eliminated.

The disposition of the supply-pipe under the hood serves to convert the liquid fuel into a gas, which backs up and stores pressure in the tank A, while at the same time supplying gas to the burners, and by employing the horizontally-disposed open burners without valves I am enabled to use with perfect success a very low grade of crude petroleum. This feature is of great importance in the economical use of a heater of this kind, for with the heaters in which valved burners were employed it was necessary to use a grade of gasoline costing from nine to twelve cents per gallon, while I have successfully operated a machine constructed in accordance with my present invention with crude petroleum costing but three cents per gallon. Furthermore, there are no burners to be burned out, with the attendant delay and expense occasioned thereby, and a much more practical and satisfactory result is produced in the use of the machine.

While I prefer to employ the hood open at one end only, when the burners are supplied with the caps illustrated in Fig. 7 the end wall of the hood may be dispensed with and the caps arranged to project sufficiently under the hood to insure the proper direction of the heat, or the nozzles or burners, without caps, may be arranged in proper relation to the open-ended hood to accomplish the desired object. Furthermore, while I prefer to use permanently open valveless burners, so far as relates to the broad idea of my invention the use of valved burners of any desired construction is within the contemplation of my invention, as well as the location of the burners under instead of outside the hood, and various other modifications which will readily suggest themselves to one skilled in the art to which my invention appertains. I have also found in practice that in the use of gasoline and similar light oils the gas generated by the exposed pipes under the hood may be relied upon to maintain the pressure in the tank originally created by the air-pump; but in the use of heavy oils I prefer to rely

upon the artificial pressure obtained by means of the air-pump, and substitute for the cock-valve K a non-return check-valve, which will permit the flow of the oil under pressure from the tank to the burner, but will prevent the return thereof or of the gas generated in the pipes exposed to the heat of the burners.

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

1. In an apparatus for repairing asphalt pavements, the combination with a hood, of one or more burners arranged to discharge horizontally into the hood, said hood being closed at the top, sides and one end thereof, and arranged to confine the heat to the limits of the same, substantially as described.

2. In an apparatus for repairing asphalt pavements, the combination with a hood open at one end thereof, of one or more burners arranged to discharge into the other end of said hood, said hood being arranged to confine the heat to the limits of the same, substantially as described.

3. In an apparatus for repairing asphalt pavements, the combination with a hood, closed at one end and open at the other and provided with one or more perforations in the

closed end thereof, of one or more burners arranged to discharge into the hood through said perforations, said hood being arranged to confine the heat to the limits thereof, substantially as described.

4. In an apparatus for repairing asphalt pavements, the combination with a portably-mounted reservoir, a hood, and a supply-pipe leading from said reservoir and disposed underneath the hood, of one or more burners connected with said pipe and arranged to discharge horizontally into the hood, said hood being arranged to confine the heat to the limits thereof, substantially as described.

5. In an apparatus for repairing asphalt pavements, the combination with a portably-mounted reservoir, a hood, closed at its top, sides, and one end thereof, and a supply-pipe leading from said reservoir underneath the hood and terminating at a point beyond one end of the hood, of one or more burners connected with said supply-pipe and arranged to discharge horizontally into the hood, substantially as described.

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