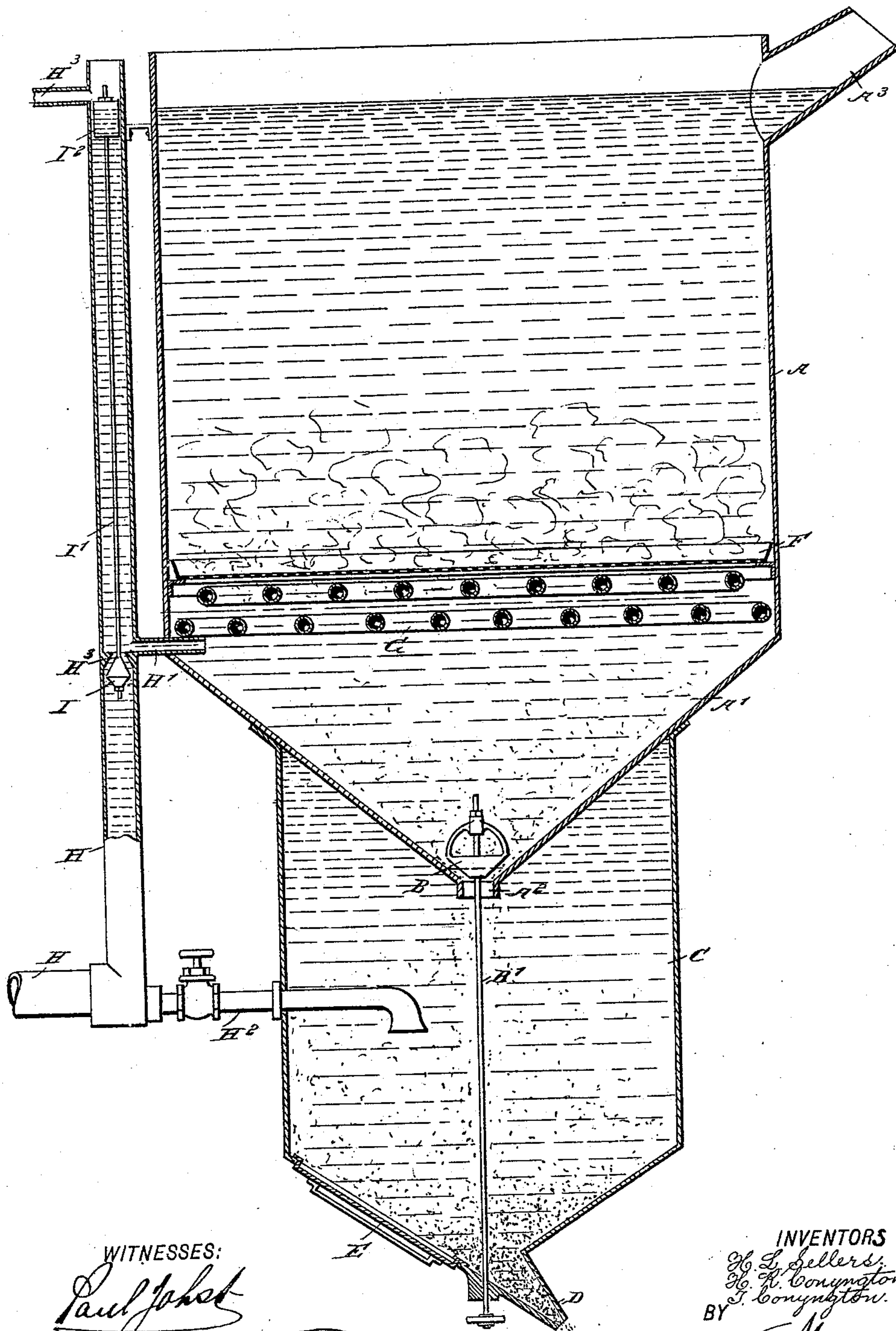


(No Model.)

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METHOD OF AND APPARATUS FOR TREATING MINERAL PITCH.

No. 549,399.

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**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

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## METHOD OF AND APPARATUS FOR TREATING MINERAL PITCH.

SPECIFICATION forming part of Letters Patent No. 549,399, dated November 5, 1895.

Application filed May 1, 1895. Serial No. 547,816. (No model.)

*To all whom it may concern:*

Be it known that we, HARVEY LEE SELLERS and HUGH RONALD CONYNGTON, of New Orleans, in the parish of Orleans and State of Louisiana, and THOMAS CONYNGTON, of Fort Worth, in the county of Tarrant and State of Texas, have invented a new and Improved Method of and Apparatus for Treating Mineral Pitch, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved method of and apparatus for treating mineral pitch and similar material to readily separate the asphalt and asphalt-oils from sand, bituminous rock, and other impurities contained in the mined material and removing the sand and impurities.

The method consists in subjecting the material to the action of hot water, so as to disintegrate the material, to separate the asphalt and asphalt-oils from the sand and other impurities, and to permit the asphalt and oil to rise in the water to the surface thereof and the sand and impurities to sink to the bottom and be removed by the action of an independent current of water or other mechanical means.

The apparatus consists of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a sectional side elevation of the apparatus.

The apparatus for carrying the above-described method into effect is provided with an open tank or vessel A, having a hopper-shaped bottom A', in the apex of which is arranged a valve-seat A<sup>2</sup>, adapted to be opened and closed by a valve B and leading to a receptacle C, attached to the under side of the bottom A', as is plainly shown in the drawing. The valve B is held on a valve-stem B', extending through the hopper-shaped bottom of the receptacle C to the outside thereof, or otherwise arranged so as to permit the operator to manipulate the valve B to open and close the latter at the valve-seat A<sup>2</sup>. The receptacle C is provided with a spout D for dis-

charging the sand and other impurities separated from the asphalt and asphalt-oil, as hereinafter more fully described. In the bottom of the receptacle C is also arranged a manhole E for cleaning the receptacle and for removal of sand when desired.

In the vessel A is arranged a pan F, having a perforated bottom extending throughout the diameter of the vessel, so that any material passed into the top of the vessel is intercepted by the said pan. Directly below the pan F is arranged one or a series of coils of pipe G, connected with a suitable steam-supply, so as to heat the water contained in the vessel A to separate the asphalt and asphalt-oil from the impurities while resting on the pan F.

A water-supply pipe H is provided with a branch pipe H', which leads into the receptacle A directly under the coil of pipe G. A second branch pipe H<sup>2</sup> connects the water-pipe H with the receptacle C. In the water-pipe H, directly under the branch pipe H', is arranged a valve-seat H<sup>3</sup>, adapted to be closed by a valve I, secured on a stem I', extending upwardly and carrying at its upper end a float I<sup>2</sup>, located at about the level of the water in the vessel A, so that the water passing through the pipes H and H' and rising in the vessel A and the upper part of the pipe H causes the float I<sup>2</sup> to rise and close the valve I at the time the level of the water is near the top of the vessel A, as indicated in the drawing. The upper open end of the pipe H is provided with an overflow H<sup>3</sup>, as shown in the drawing.

In the upper end of the vessel A is arranged a spout A<sup>3</sup>, extending upwardly and outwardly to permit of conveniently removing the separated asphalt and asphalt-oil floating on the top surface of the water in the vessel A.

The crude material—that is, the mined mineral pitch or asphalt sandstone—is placed in the vessel A, so as to pass through the heated water, disintegrating as it falls, and finally resting in the pan F, in which the greatest heat emanating from the coil of pipe G acts on the material, so as to complete the separation of the asphalt and asphalt-oil from the



sand or other impurities. As soon as separated the asphalt and asphalt-oil rise in the water contained in the vessel A, to be finally removed at the spout A<sup>3</sup>, as previously described. The sand and other impurities pass through the perforated bottom of the pan F and guided by the sloping sides accumulate in the hopper-bottom A', from which the said impurities can be let into the sand-receptacle C by the operator opening the valve B. This may be done continuously by leaving the valve B open a sufficient distance or from time to time alternately opening and closing the valve. As the sand falls through the receptacle C, which is filled with water, it is caught in the current caused by inflow from pipe H<sup>2</sup> and carried by said current through the spout D to the outside. This inflow of water from the pipe H<sup>2</sup> is regulated so as to exactly equal the water-escape from the spout D, thus preventing any disturbance of water in the vessel A. The sand-chamber C is entirely full of water, as otherwise the water from the vessel A would drain into it.

It will be understood that the sand-receptacle C may be omitted and the sand be discharged through the valve-seat A<sup>2</sup> directly from the bottom A', the water escaping through valve-seat A<sup>2</sup> being replaced by automatic inflow through pipe H'; but in doing this a considerable amount of the hot water contained in the vessel A would be lost and wasted.

By the arrangement described the sand is continuously discharged through the spout D. When desired, the spout D may be closed and the sand and other impurities allowed to accumulate in the receptacle C, from which they may be removed from time to time by closing the valve B and opening the manhole E, allowing the sand and other impurities to drop out. This removal may be accelerated by flushing with water from the pipe H<sup>2</sup> or by other mechanical means.

By the action of the valve I and float I<sup>2</sup> the level of the water in the vessel A is constantly maintained.

If desired, the coil of pipe G may be perforated, so that steam can escape through the perforations to assist in quickly and thoroughly heating the material intercepted by the pan F to separate the asphalt and oils from the sand and other impurities.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. The herein described method for treating mineral pitch, consisting in subjecting the material to the action of heat while submerged in hot water to disintegrate the material so as to separate the asphalt and asphalt oil from the impurities and to permit the asphalt and oil to rise in the water to the surface thereof discharging the sand and other impurities by gravity, and connecting the sand discharge or outlet with a body of water whereby the sand and other impuri-

ties may be discharged from the heating vessel without disturbance of the water therein, substantially as described.

2. The herein described method for treating mineral pitch, consisting in subjecting the material to the action of heat while submerged in hot water to disintegrate the material to separate the asphalt and asphalt oil from the impurities and to permit the asphalt and oil to rise in the water to the surface thereof, discharging the sand and other impurities by gravity, connecting the sand discharge or outlet with a body of water, and maintaining a current through said body of water, whereby the sand and debris falling therein may be continuously discharged, substantially as described.

3. In an apparatus for the treatment of mineral pitch, the combination with a vessel adapted to contain water and in which the material is heated, of a water holder filled with water and located at the outlet of said vessel, communicating therewith and serving as a seal therefor, the said water holder being provided with an outlet opening in its bottom, and means for causing an inflow of water approximately equal to the discharge, whereby the sand and debris falling from the heating vessel into said water holder are continuously removed therefrom, while the water seal of the heating vessel is maintained, substantially as described.

4. An apparatus for the treatment of mineral pitch, comprising a vessel in which the material is heated, a sand receptacle arranged below the said heating vessel and connected therewith by a valve controlled opening, the said sand receptacle being filled with water and provided, with an outlet opening in its bottom, and a pipe connected with a water supply and communicating with the said sand receptacle, the said pipe being arranged to cause an inflow of water approximately equal to the discharge whereby a current is produced which continuously carries the sand and debris through the said outlet to the outside of the apparatus, substantially as shown and described.

5. An apparatus for treating mineral pitch, comprising a vessel having a hopper-shaped bottom containing an outlet, a water supply pipe for the said vessel, to supply the latter with water for its operation, a pan having a perforated bottom and arranged in the said vessel above the hopper-shaped bottom, a steam coil for heating the water in the vessel, below the said pan, and an inclined spout on the upper end of the said vessel, to remove the asphalt and asphalt oil floating on the top of the water contained in the vessel, substantially as shown and described.

6. An apparatus for treating mineral pitch, comprising a vessel having an inclined spout on its upper end and a hopper shaped bottom containing an outlet, a perforated support for the material, a water supply pipe for the said vessel to supply the latter with water for its



operation, means for heating water in the vessel, and a valve controlled by a float for maintaining a constant supply of water from the said water supply pipe to the vessel, substantially as shown and described.

7. An apparatus for treating mineral pitch, comprising a vessel having a hopper-shaped bottom containing an outlet, a perforated support for the material arranged in the said vessel above the hopper-shaped bottom, a steam coil for heating the water in the vessel, a water supply pipe having a branch pipe communicating with the said vessel, the said water supply pipe extending upward at the side of the vessel and provided with an overflow pipe at its upper end, and a valve controlled by a float for maintaining the level of the water in the vessel, substantially as shown and described.

8. An apparatus for treating mineral pitch, comprising a vessel adapted to contain water and having a hopper-shaped bottom containing a valve controlled outlet, a water supply pipe for the said vessel, a perforated support arranged in the said vessel above the hopper-shaped bottom, means for heating the water in the vessel, a sand receptacle adapted to be filled with water and into which discharges the outlet opening of the hopper bottom, the said sand receptacle having an outlet spout and a manhole, and a water supply pipe for admitting water to the said sand receptacle, substantially as shown and described.

9. An apparatus for treating mineral pitch, comprising a vessel having a hopper-shaped bottom provided with a valve controlled outlet, a water supply pipe for the said receptacle to supply the latter with water for its operation, a pan having a perforated bottom and arranged in the said vessel above the hopper-shaped bottom, a steam coil for heating the

water in the vessel, a sand receptacle adapted to be filled with water and with which the heating vessel communicates through the valve controlled opening in the hopper bottom, a water supply pipe extending into the said sand receptacle, an outlet opening in the bottom of said sand receptacle, and means to cause therein an inflow of water equal to the discharge, substantially as shown and described.

10. An apparatus for treating mineral pitch, comprising a vessel having an inclined spout on its upper end and provided with a hopper shaped bottom containing an outlet, a valve controlling said outlet, a water supply pipe for the said vessel, a valve controlled by a float for regulating the supply of water to the said vessel, a pan having a perforated bottom and arranged in the said vessel above the hopper-shaped bottom, a steam coil for heating the water in the vessel arranged below the said pan, a receptacle adapted to contain water and arranged below the said heating vessel and communicating therewith through the said valve controlled outlet, the said receptacle being provided with an outlet spout and a manhole, and a water supply pipe communicating with the said receptacle, substantially as shown and described.

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