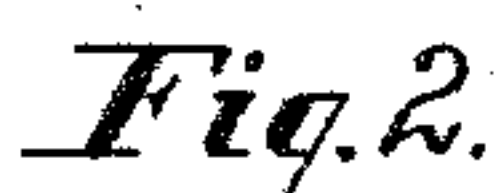


(No Model.)

W. S. WILKINSON.

PROCESS OF AND APPARATUS FOR THE MANUFACTURE OF COMPRESSED ASPHALTUM BLOCKS.

Patented Aug. 5, 1884.



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UNITED STATES PATENT OFFICE.

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PROCESS OF AND APPARATUS FOR THE MANUFACTURE OF COMPRESSED ASPHALTUM BLOCKS.

SPECIFICATION forming part of Letters Patent No. 303,093, dated August 5, 1884.

Application filed December 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. WILKINSON, a citizen of the United States, residing in the city of Baltimore, State of Maryland, have
5 invented certain Improvements in Processes of and Apparatus for the Manufacture of Compressed Asphaltum Blocks, of which the following is a specification.

In the common processes of manufacturing
10 compressed asphaltum blocks it has been customary to evaporate the water from the crude asphaltum in heating kettles, pans, melters, or kindred receptacles, with and without paddles or other apparatus to agitate or stir the
15 asphaltum, and after the water has been evaporated to add, in a cool condition, a certain quantity of residuum of petroleum, for the purpose of softening the asphaltum, so as to constitute what is known as "paving-cement."
20 The residuum of petroleum of commerce contains more or less water. The addition of this material in a cool state—that is, at about the temperature of the atmosphere at the various seasons at which the work may be prosecuted—to the hot asphaltum produces ebullition, and requires considerable time and great
25 skill and patience. It also reduces the temperature of the entire charge, so that a longer time is required to bring it up to the temperature necessary for successful block-making
30 than would be the case if the residuum or oil were added in a hot and dry state.

To more fully explain, in the preparation of pavement cements composed of asphaltum
35 and petroleum residuum it has heretofore been customary to melt the asphaltum in a suitable and separate receptacle, and in so doing to evaporate the water from it, and then to add to the melted and heated asphaltum a sufficient quantity of the residuum of petroleum
40 in its natural state—that is to say, as sold in commerce, or direct from the barrels in which it is transported, and at or about the temperature of the atmosphere. Residuum of petroleum, however, always, or nearly always,
45 contains a certain amount of free water, which it takes from the atmosphere. This contained water, as well as the low relative temperature of the residuum, when added to the heated
50 mass of asphaltum, produces ebullition or foaming, and has frequently been the cause

of the boiling over of the commingled mass from the melters or kettles in which said mass is contained, from whence has more than once resulted a serious conflagration, due to the running of the overflowed mass into the furnaces, and the destruction of the entire apparatus or plant. It has therefore required great caution and a long period of time for the addition of the charge of natural or unheated petroleum residuum to the charge of heated asphalt. I have discovered that when the residuum of petroleum is separately heated to nearly the same temperature as that of the mass of heated asphalt, and all the water
60 thereby evaporated from it, the said residuum can be added to the heated asphaltum quite rapidly and without especial care, and that the commingled and separately-heated ingredients can then be agitated without delay, and
65 in such manner a composition to be added to pulverized stone for the manufacture of paving-blocks be rapidly and economically produced, and this without danger of conflagration to the plant.
75

In the accompanying drawings I have represented a convenient apparatus adapted to carry my invention into practice.

The apparatus represented in Figure 1 of said drawings embodies certain parts of an apparatus for manufacturing blocks of artificial
80 stone invented by Thomas Cook, and patented to him in and by United States Letters Patent No. 161,866, dated April 13, 1875, to which reference is to be made for a more complete
85 understanding of my invention.

In the drawings, A represents the brick-work of the Cook apparatus, in which are built and supported kettles B or vessels, in which the asphaltum is heated by means of
90 furnaces C in the manner described in the foregoing Letters Patent. The kettles are represented as provided with rotary agitators *a*.

E is the heater, in which the pulverized or granulated stone or other suitable material is
95 properly heated.

All of the foregoing features are set forth at length in the patent referred to, and need not be further described here.

D is a steam heating tank, which I have devised for heating the residuum of petroleum.
100 It is placed upon the top of the brick-work in

the manner represented in the drawings, and in such manner that its spigots *d* open above the kettles. This tank may be made in different ways, either with a double bottom, as represented in Figs. 2 and 3 of the drawings, or with a single bottom, upon which is placed a gang of steam heating pipes. The double bottom is preferable, because the residuum has a good deal of coke in it, which forms in a thick mass on the bottom in the course of repeated chargings of the tank, and, being a non-conductor, retards the operation of heating. With a single bottom and pipes it is difficult to clean out the coke, whereas with the smooth double bottom it may very readily be cleaned out. When the bottom of the tank is made double, it should be fastened together with stay-bolts *d'*, as in the construction of steam-boilers, to prevent the pressure from separating the plates, all as well represented in the drawings. By heating the residuum of petroleum the process of manufacturing blocks is greatly facilitated, and one of the dangers attendant upon the process heretofore in use—viz., that of the boiling over of the material, and its running into the furnace, so as to occasion conflagration—is entirely obviated, as the heated and dried oil can with impunity be added to the kettles as rapidly as is desired, while the process of mixing after the addition of the residuum need be continued for a short time only before the material may be used to make the blocks, whereas under the old practice several hours were frequently consumed before the material reached the proper temperature and dryness to be fit for use. I simply warm the residuum in the barrels by, for instance, placing them in a heated room until it is heated up to, say, 100°, a temperature adapted to soften the coke and render the whole contents of the barrel soft enough to flow through the bung-hole. I then pour the liquid residuum into my tank and turn on the steam until the heat is such that the water is evaporated and the material heated up to, say, 240° or 250°. Then, when the asphaltum in the kettle is found to have had all its water expelled by evaporation, this heated residuum is drawn directly from the tank by means of the cock into the asphaltum-kettle. The percentage to be used having been previously determined, it is only necessary to know how many pounds of asphaltum have been placed in the kettle, and what the weight of one inch in depth of residuum in the tank is—both easily determinable—and then to draw as many inches from the tank into the kettle as will give the desired quantity. After the mixing in the kettle by the motion of the paddles has been continued

for a short time, the contents of the kettle are ready to be manufactured into blocks.

By the above-described process of heating the residuum and expelling the water from it and then supplying the liquid residuum in a heated condition to the heated asphaltum an average of several hours' time is saved in preparing an average charge of, say, ten tons.

In the drawings I have simply represented one form of tank, in which *d*^x is a steam-inlet, whereby steam is introduced into the interspace between the double bottom of said tank. Other forms may of course be employed. In the drawings, also, two kettles are represented. One, however, may be employed, or, if desired, more than two. The arrangement represented is simply the most convenient one of which I have knowledge.

I am aware that a composition of native bitumen or asphaltum and the heavy oil or residuum of petroleum or candle-tar mixed together has for some years been known in the arts as a roofing material, and to such a composition, *per se*, I lay no claim; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The method of manufacturing a composition to be added to pulverized stone for the manufacture of paving-blocks, which consists, first, in separately heating a given quantity of residuum of petroleum and a given quantity of asphaltum; second, in commingling the said separately-heated ingredients; and, third, in agitating the said commingled ingredients.

2. The combination, to form an apparatus for the manufacture of material from which to make paving-blocks, of one or more kettles, furnaces adapted to heat said kettles, and a tank provided with devices whereby it can be heated, and with spigots or other outlets for the discharge of its contents into the kettles aforesaid, substantially as and for the purpose specified.

3. The combination, to form an apparatus for the manufacture of material from which to make paving-blocks, of one or more kettles provided with rotary or other suitable agitators, furnaces adapted to heat said kettles, and a tank provided with devices whereby it can be heated, and with spigots or other outlets for the discharge of its contents into the kettles aforesaid, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name this 21st day of December, A. D. 1883.

WALTER S. WILKINSON.

In presence of—

J. BONSALE TAYLOR,
W. C. STRAWBRIDGE.