July 14, 1925. 1,546,185

H. P. ANDRESEN

COMBINATION HEATER AND MAINTENANCE WAGON

Original Filed Aug. 27, 1920 2 Sheets-Sheet 1

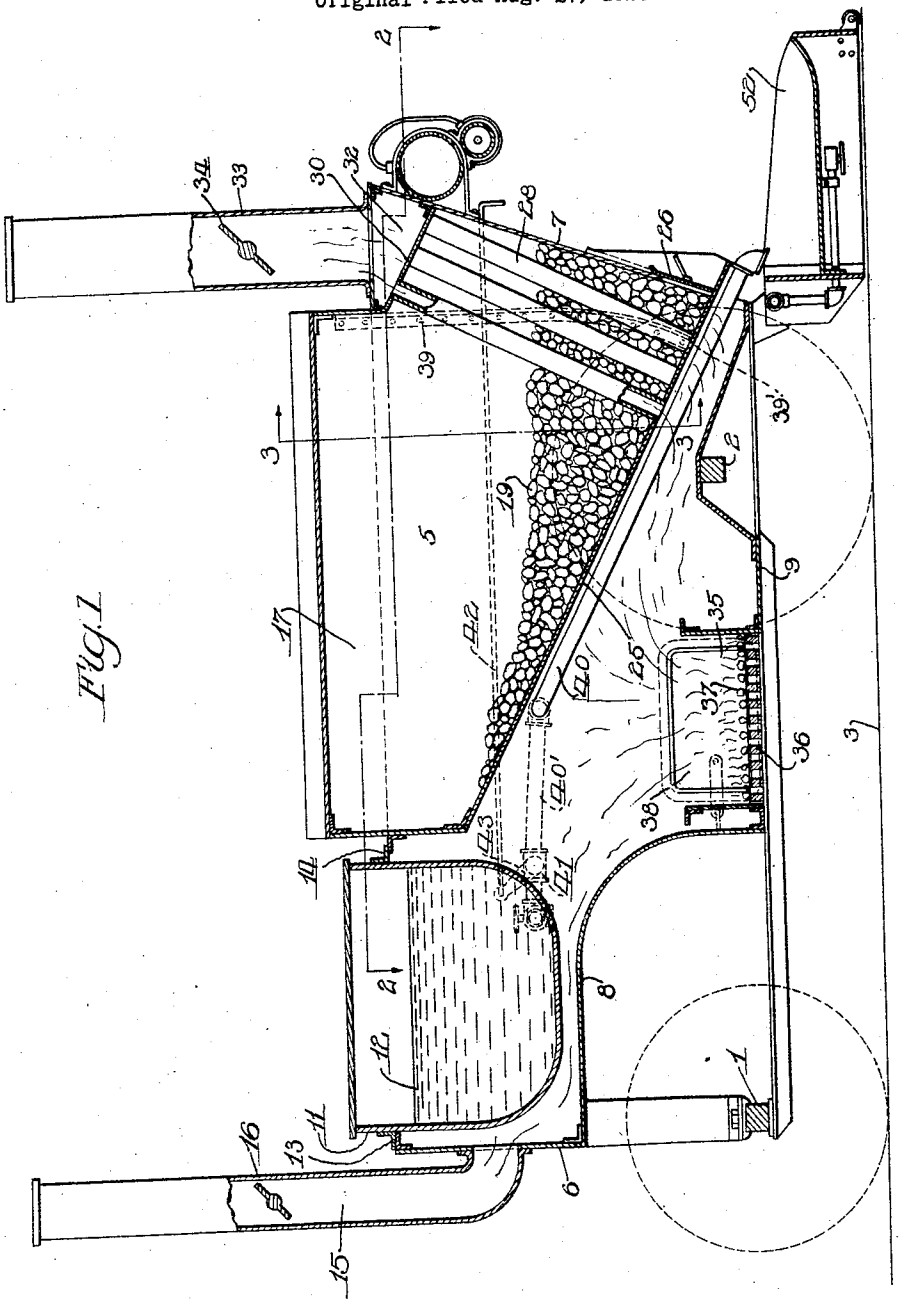


Fig. 1

Inventor
Herman P. Andresen
By. Arthur M. Robertson Atty.

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Fig 2

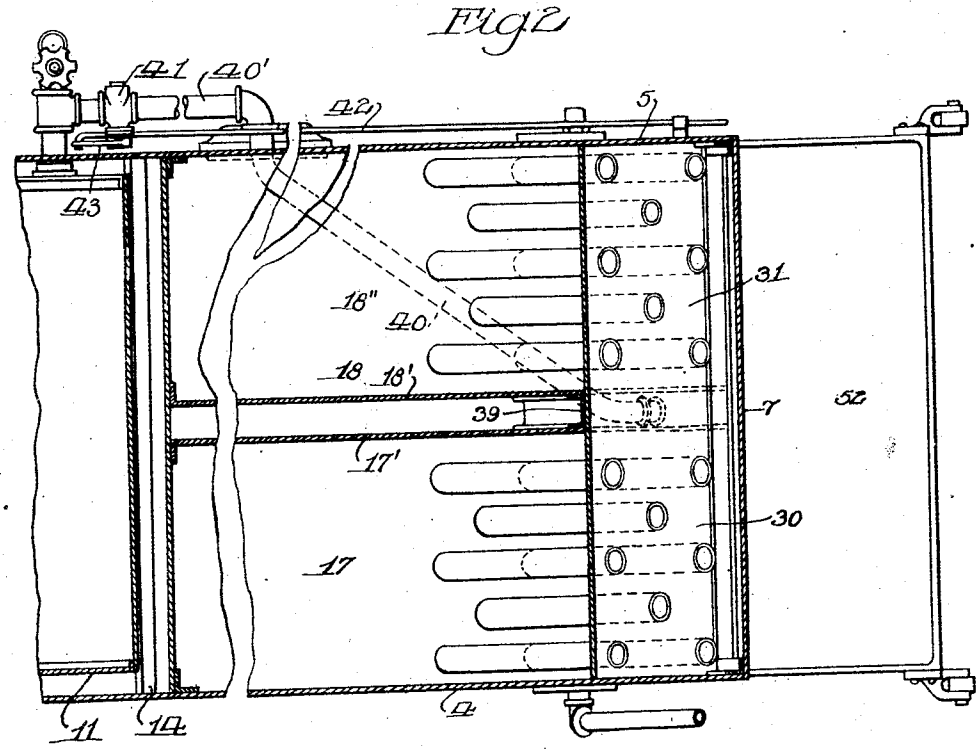
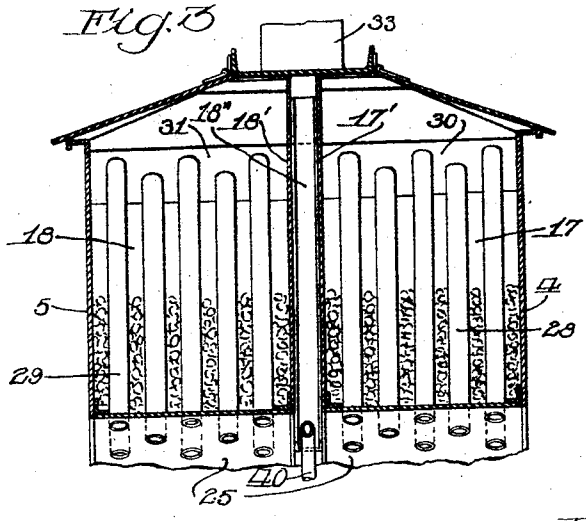


Fig. 3



Inventor:
Herman P. Andresen
By Arthur W. Tebbetts Atty.

Patented July 14, 1925. 1,546,185

UNITED STATES PATENT OFFICE.

HERMAN P. ANDRESEN, OF CHICAGO, ILLINOIS.

COMBINATION HEATER AND MAINTENANCE WAGON.

Original application filed August 27, 1920, Serial No. 406,387. Patent No. 1,376,852, dated May 3, 1921. Divided and this application filed March 22, 1921. Serial No. 454,517.

To all whom it may concern:

Be it known that I, HERMAN P. ANDRESEN, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Combination Heaters and Maintenance Wagons, of which the following is a specification.

This is a division of my co-pending application Serial Number 406,387, filed August 23, 1920 and entitled "Combination heater and maintenance wagon."

My invention relates generally to wagons or portable apparatus for use in road construction and maintenance work, and relates more particularly to wagons or portable apparatus adapted for use in construction work in which the characteristics of some of the material to be used or acted upon requires the application of heat.

For patching or repairing roads or pavements of a bituminous nature, such for example as asphalt, tar bound aggregate and the like, it is necessary to heat materials and also to mix them before application to the road or pavement.

For patching or repairing roads or pavements of the bituminous nature before referred to, particularly asphalt, it is necessary to remove part of the material around the hole, depression, or other defective place in order that a portable patch or repair can be properly made. This operation can be most readily accomplished by applying heat to the road at that spot, but suitable means for this purpose has not heretofore been provided as a part of a repair wagon or apparatus.

It is an object of my invention to provide a wagon or portable device of such character that the materials to be used for the road repair can be properly conditioned for use, and which shall also be adapted to condition the road or pavement for the reception of such road materials. I aim also to provide apparatus whereby all of these operations can be carried on simultaneously, if desired and wherewith it shall be possible to make the repair in less time, with less labor and at less cost than is possible when employing the apparatus heretofore devised for such work.

Again it is an object of my invention to provide a device upon which repair materials can be mixed prior to application thereof to the road or pavement, maintained at the conditioned temperature while being mixed, if desired, and which shall serve also as a device for applying and localizing heat to the road or pavement at the desired place.

It is a particular object of my invention to provide means whereby such materials as wet or damp sand and stone or other aggregate and binder material such as asphalt, can be concurrently raised to the desired temperature and the necessary quantities of each prepared at such rate that no delay shall be caused waiting for one of the materials to be conditioned, and yet which shall be economical in the use of fuel and capable of accurate and easy control.

My invention consists generally in the form, arrangement, construction and cooperation of the parts whereby the above named objects, together with others that will appear hereinafter, are attainable; and my invention will be more readily understood by reference to the accompanying drawings which illustrate what I consider at the present time to be the preferred embodiment thereof.

In said drawings:

Fig. 1, is a longitudinal vertical section of a device embodying my invention.

Fig. 2 is a view substantially on the line 2—2 of Fig. 1; and

Fig. 3, is a view substantially on the line 3—3 of Fig. 1.

Apparatus of this character is of particular use in repairing and patching roads and pavements of a bituminous nature such as asphalt, tar bound aggregate etc., and, for this reason, I shall describe the apparatus with especial relation to such work. This, it should be understood, is by way of illustration and not by way of limitation.

The apparatus here shown is a wagon and comprises a front axle 1, and a rear axle 2 upon which suitable road wheels are mounted for travel upon the ground 3. Upon these wheels a superstructure of novel form is mounted. As here shown it is composed of side plates 4 and 5 which are spaced apart and which together with the front plate 6, rear plate 7 and bottom plates 8 and 9 form a box like enclosure hereinafter termed a fire box.

At the forward part of the apparatus I arrange a vessel or tank 11 in which material 12 is heated. This material will fre-

quently be a bituminous material such as tar, asphalt and the like which must be brought to proper temperature for use. The vessel 11 is suitably supported from the side and end plates by means of the angle irons 13 and 14 and the bottom of the vessel is supported somewhat above the plate 8, thereby forming a passageway for the gases of combustion. A smoke stack 15 having a damper 16 therein leads from the front plate 6.

At the rear end of the wagon I have provided bins or containers 17 and 18 in which, ordinarily, aggregate such as gravel, stone and the like, indicated at 19, will be placed. Relatively more of the aggregate material is used in repair work than of the tar, asphalt or binder material and the aggregate material is oftentimes wet or damp so that it must be first dried by driving off the moisture and then raised to suitable working temperature. I aim to provide means whereby this can be effectively accomplished with such speed that no appreciable delay shall be caused due to the necessity of waiting for the aggregate materials to be raised to working temperature. As will be shown hereafter this results in certain advantages with respect to the heating of the tar, asphalt or other bituminous materials. In order to provide large heating surfaces for the bins 17 and 18 I have spaced inner walls 17′ and 18′ thereof a short distance apart, thus providing a passageway 18″ therebetween into and through which the products of combustion can flow. Thereby there is imparted heat to the plates 17′ and 18′ which, in turn, give off their heat to the aggregate material in the bins, and serve to drive off the moisture and furnish a preliminary heating of the aggregate material. The bottom plates 25 of the aggregate bins are preferably inclined at such an angle as will enable the aggregate material to slide or fall by gravity when the control gates 26 or 27 are opened. Before the aggregate material can pass through the gates 26 or 27 it must pass by additional heating surfaces. In this instance these heating surfaces take the form of groups of flues 28 and 29, respectively which extend between the lower or bottom plates 25 of the aggregate bins and the upper plates 30 and 31, respectively, the plates 30 and 31, paralleling the bottom plates 25. A smoke box 32 is formed above the flues and therefrom leads a smoke stack 33 which is provided with a damper 34. I prefer to make the smoke stack 33 larger than the smoke stack 15, as usually a greater part of the products of combustion will pass out through the stack 33.

I shall now describe the fire box and the operation of distributing the products of combustion therein. In the present instance a fuel box 35 is positioned in the central lower part of the fire box and is provided with a grate 36 upon which the fuel 37 is supported. The fuel may be placed upon the grate through the fuel door 38. I prefer to place the grate substantially centrally of the apparatus so that the gases may find their escape easily through either of the stacks 15 or 33. Such gases as are permitted to pass through the stack 15 must obviously engage the walls of the vessel 11 and heat the material 12 therein. A greater part of the products of combustion will pass outwardly through the stack 33. On their way to the stack 33 part thereof will pass upwardly into the space 18″ between the two aggregate bins and in order to prevent direct flow in the stack 38, or conversely to cause them to flow a longer distance, I have inserted a baffle plate 39 which causes such gases to pass downward under the lower end 39′ thereof at which time they can pass upwardly and between the two plates 17′ and 18′ at the rear of the baffle plate 39 and through the smoke box 32 into the stack 33. A considerable part of the gases will flow upwardly through the flues 28 and 29 and much of such gas comes directly from the grate and hence will be very hot, resulting in raising the temperature of the flues to a high degree. Thus after the moisture has been driven from the aggregate by the heat imparted thereto through the walls 17′ and 18′ they have become preliminarily heated and are quickly brought or raised to the final desired temperature by engagement with the hot flues or pipes 28 and 29.

By means of the dampers 16 and 34 the effective size of the smoke stacks may be varied. These dampers or valves are provided not only for the purpose of regulating the amount of air that shall pass through the grate for combustion purposes, but also to the end that a smaller quantity of the gases of combustion may pass through one of the smoke stacks than through the other. That is to say, by regulating the dampers 16 and 34 such proportion of the total volume of the products of combustion generated may be caused to flow through one stack as is desired, and the remainder through the other. Thus all danger of overheating one of the materials and underheating the other is avoided. At the same time a much greater quantity of aggregate material can be raised to desired temperature with such speed that the work is not delayed waiting for the heating thereof.

For the discharge of the material from the vessel 11 I provide an inclined pipe 40 the lower end of which extends for a considerable distance through the fire box and the upper end of which is carried outside of

the fire box but relatively close thereto. I desire to keep the material 12 hot as it flows. I also desire to have a valve controlling the flow thereof positioned relatively close to the vessel 11. If this valve were located within the fire box the material would become coked in the valve. I overcome this difficulty and still secure the desired heating by mounting the control valve 41 just outside of the fire box where it can be conveniently controlled from the rear of the apparatus by means of the pull rod 42 and the lever 43. A short length of pipe 40′ connects with the pipe 40 that is arranged in the fire box. At times it may be desirable for some purposes to draw material directly from the vessel 11 and I have, therefore, provided a valve 44 for that purpose. In this manner the material can be properly flowed and heated without any danger of coking or stopping the valve.

For the purpose of mixing the materials which have been heated in the wagon I provide the mixing pan 52. Inasmuch as the mixing pan, its construction and uses are described and claimed in my aforementioned co-pending application no description will be given here. It may be stated here, however, that the materials, previously heated in the wagon, are discharged in suitable quantities upon the upper side of the mixing pan.

The many advantageous features of the construction and operation will be understood by those skilled in this art without further comment.

I claim:—

1. An apparatus of the class described embodying therein a material mixing pan, a firebox, a receptacle within the firebox for heating binding material that is fluid when hot, and a pipe for the discharge of said material upon said mixing pan, said pipe having a part thereof extending through the firebox and a part carried on the outer side of the firebox, together with a control valve arranged in that part of the pipe that is carried on the outer side of the firebox.

2. An apparatus of the class described embodying therein a firebox, a material receptacle arranged within the firebox and, including an inclined bottom wall, the said receptacle having a discharge opening at the bottom end of said wall, and a plurality of heating elements in said receptacles and fixed at one end to said inclined bottom walls adjacent said discharge opening.

3. An apparatus of the class described embodying therein a fire box, a plurality of material bins therein having inner walls spaced apart to form a heating chamber therebetween, and a plurality of heating elements in each said bins positioned adjacent the discharge openings thereof, and a baffle located in the heating chamber between the inner walls of the material bins.

4. An apparatus of the class described embodying therein a firebox, a material receptacle arranged within the firebox and including an inclined bottom wall, the said receptacle having a discharge opening at the bottom end of said wall, a smoke box positioned at the top of said receptacle, and a plurality of flues opening at their bottom ends through said bottom wall near said discharge opening and communicating at their top ends with said smoke box.

5. An apparatus of the class described, embodying therein a fire box, a material bin therein and provided with an inclined bottom, an outlet flue for said fire box and heating means in said receptacle and positioned adjacent said discharge opening, said means comprising a plurality of flues extending upwardly through the bin from the inclined bottom thereof.

In testimony whereof, I have hereunto set my hand, this 12th day of March, 1921.

HERMAN P. ANDRESEN.