

H. P. ANDRESEN.
COMBINATION HEATER AND MAINTENANCE WAGON.
APPLICATION FILED AUG. 27, 1920.

1,376,852.

Patented May 3, 1921.

3 SHEETS—SHEET 1.

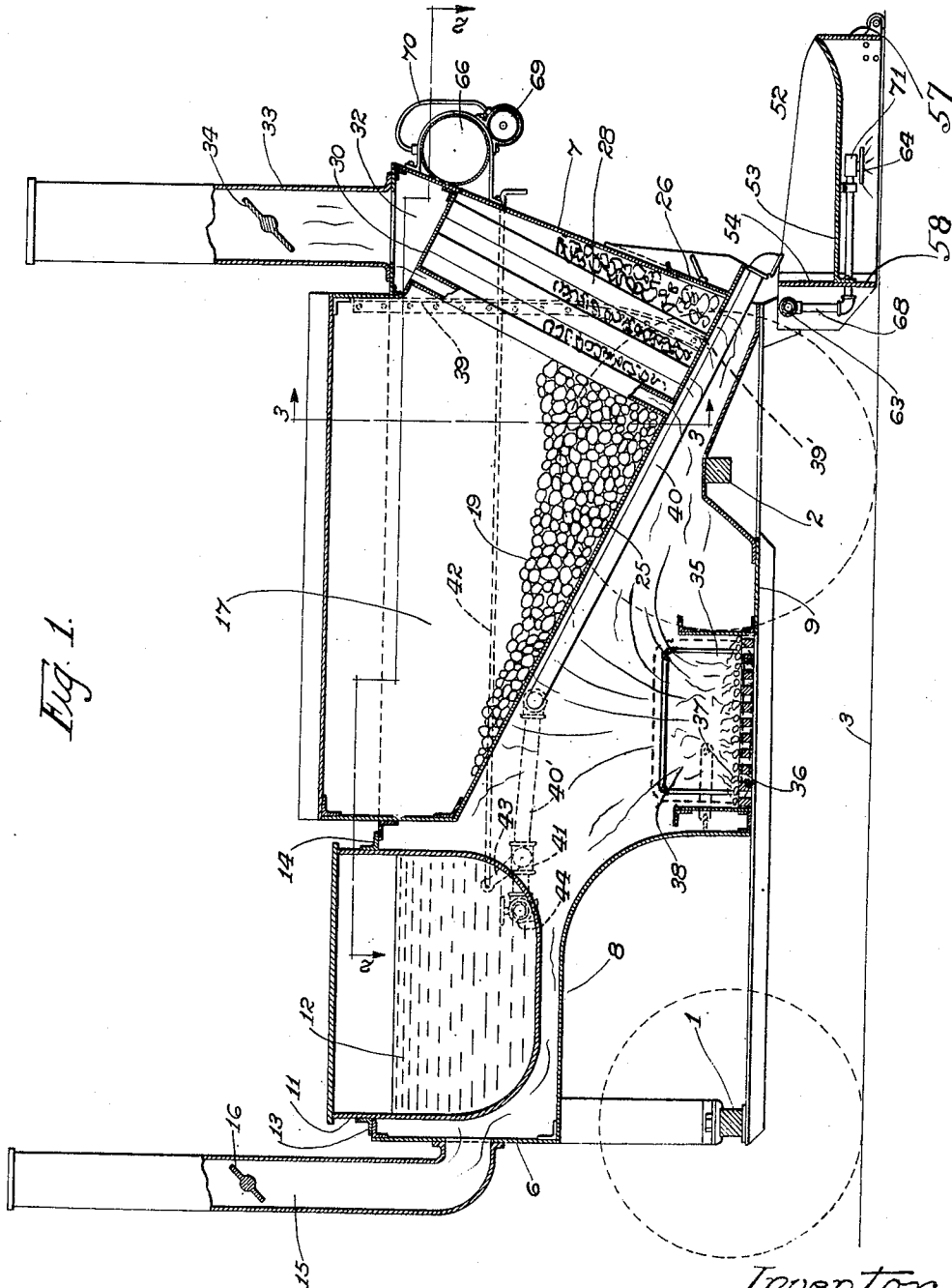


Fig. 1.

Inventor.
Herman P. Andresen.
By *Arthur W. Nelson*
Atty.

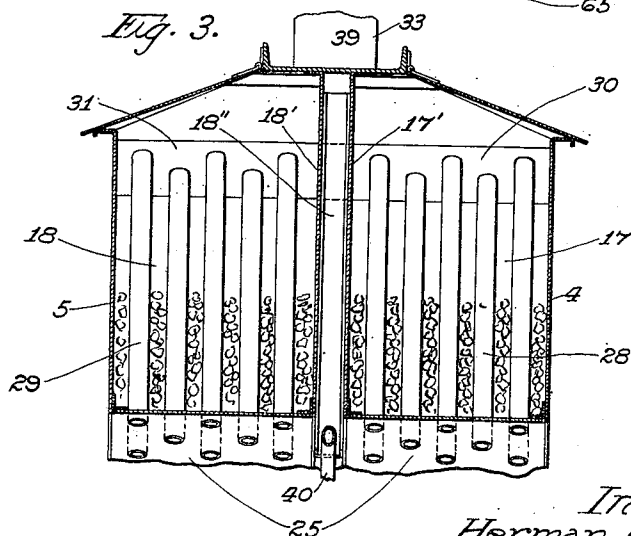
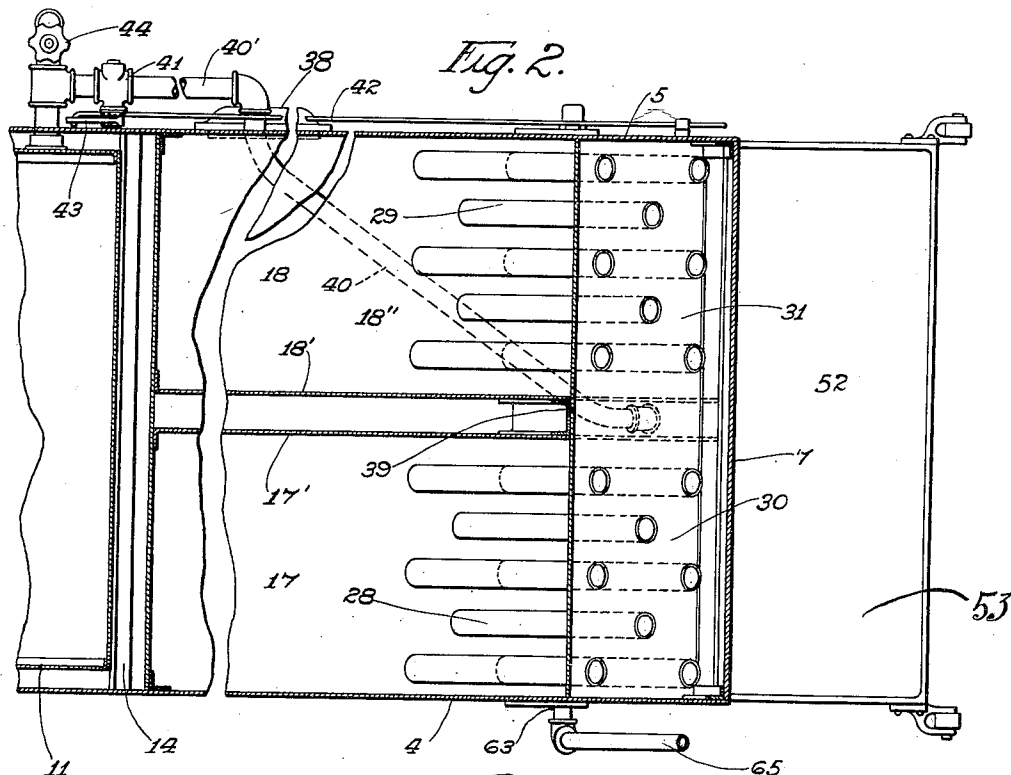
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3 SHEETS—SHEET 3.

Fig. 4.

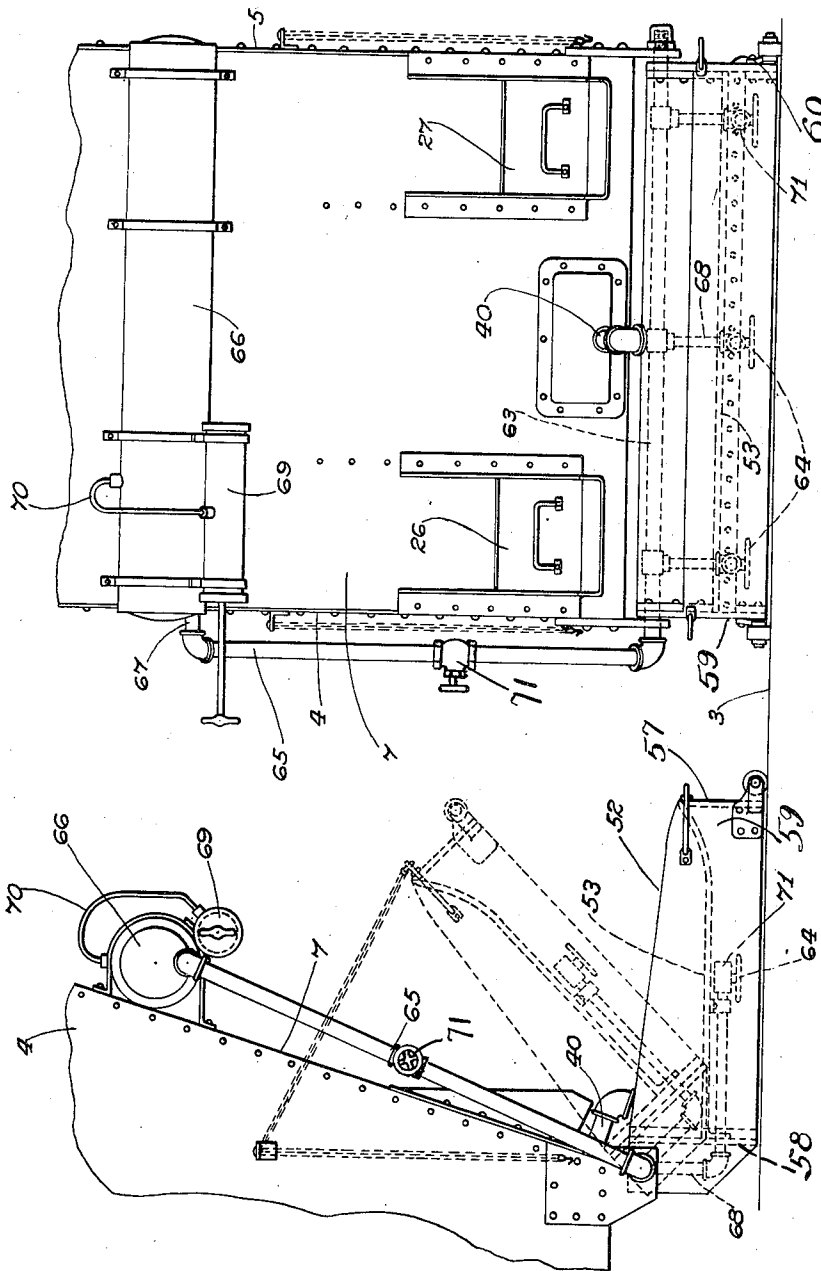


Fig. 5

Inventor:
Herman P. Andresen.

By: *Arthur M. Nelson*
Atty.

UNITED STATES PATENT OFFICE.

HERMAN P. ANDRESEN, OF CHICAGO, ILLINOIS.

COMBINATION HEATER AND MAINTENANCE-WAGON.

1,376,852.

Specification of Letters Patent.

Patented May 3, 1921.

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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.

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:

Figure 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;

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

Fig. 4, is a detail fragmentary view of the rear end of the apparatus; and

Fig. 5 is a fragmentary elevation of the rear end.

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 inclosure 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 frequently 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 often times 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 pre-

fer 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 a mixing pan 52. This pan, as here shown, comprises a bottom 53, back wall 54, together with substantially triangular end walls 55 and 56. Dependent from the bottom 53 will be found side walls 57 and 58 which are connected at the ends by walls 59 and 60 and which, therefore, form a box-like space or inclosure 61. The bottom edges of the walls 7, 8, 9 and 10 are positioned to terminate slightly above the road or ground 3.

The whole pan is mounted upon a transverse pipe 63, which pipe forms a dual purpose, to-wit, that of a pivot for the pan and also as a conduit to supply fuel to burners 64 mounted under the bottom wall 63 of the pan. Pipe 63 at one end is connected to a riser pipe 65, which, in turn, is connected to a liquid fuel reservoir 66 as by means of the pipe 67. Connection between the burners 64 and transverse pipe 63 is made by means of connecting pipes 68. I prefer to use a liquid fuel for the burners 64 and the best result can be obtained by spraying the fuel through the burners under pressure. For this reason I have provided a pump 69 which is connected by means of a pipe 70 to the fuel reservoir 66 and whereby the fuel in the reservoir 66 can be placed under pressure. The supply of fuel to the burners 64 can be suitably controlled by means of the valve 71.

In the use of the device the mixing pan will be placed over the part of the pavement to be repaired and the burners 64 lighted. As shown they direct the flame downwardly against the pavement and the heat generated thereby is confined or localized to the desired zone by means of the walls 57, 58, 59 and 60. While the pavement is being heated, the workmen can proceed to mix materials for application thereto. The materials, previously heated in the wagon, are discharged in suitable quantities upon the upper side of the bottom wall 53 of the mixing pan. Thus the aggregates will be discharged through either or both of the doors or discharge openings 26 and 27, whereas the heated bituminous material

such as tar, asphalt or the like will be discharged upon the pan through the discharge pipe 40. While the materials are being mixed in the pan they can be maintained at desired working temperature for mixing an application by means of the heat rising through the bottom 53. Thus the burners 54 may serve not only to heat pavement but also to heat or maintain at desired temperature the materials being mixed. This is of especial advantage in the winter months when abnormal cooling of the material might occur particularly when only a small amount is being mixed for a small patch or repair. Much economy of time and material is thus effected and the material ideally conditioned for use. Thus heating of the pavement and the mixing of the material can be carried on concurrently so that when the patch is ready no delay need be caused but the material can be immediately applied. Even though it be mixed somewhat before it is needed it can be kept at proper working temperature.

The apparatus contains all of the necessary features for making a proper repair. It is simple, compact, and admirably adapted to the work intended.

When not in use the combined mixing pan and road heater can be swung to the vertical position shown by dotted lines in Fig. 2, in which position it is clear of the road a sufficient distance to permit rapid transportation of the apparatus without danger of injury thereto. In this position it also provides a holder in which the various tools and irons can be carried.

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

I claim:—

1. An apparatus embodying therein a material mixing pan and means for supplying heat thereunder, thereby forming a combined surface heater and mixing pan.

2. An apparatus embodying therein a material mixing pan, means for supplying heat thereunder, means for confining the heat thereunder against undesired dissipation, thereby forming a combined surface heater and mixing pan, and means pivotally supporting said mixing pan from the apparatus whereby it can be swung to and from operative or mixing position.

3. An apparatus embodying therein a material mixing pan, means for supplying heat thereunder, means depending from the material mixing pan for localizing the heat thereunder, thereby forming a combined surface heater and mixing pan, and means pivotally supporting said mixing surface from the apparatus whereby it can be swung to and from operative or mixing position.

4. An apparatus embodying therein a material mixing pan, means arranged to generate heat and discharge it under the material mixing pan, thereby forming a combined surface heater and mixing pan, and means for supplying fuel to said heat generating means, said means including a pipe on which said mixing pan is pivoted and which is connected to the heat generating means.

5. An apparatus of the class described, embodying therein a material mixing pan, means arranged to discharge heat under the mixing pan, thereby forming a combined surface heater and mixing pan, and means

for heating material and discharging same in heated condition upon said mixing pan.

6. An apparatus of the class described, embodying therein a material mixing pan, means arranged to discharge heat under the mixing pan, thereby forming a combined surface heater and mixing pan, receptacles for holding aggregate material and binder material, means for heating same, and means for discharging said materials in heated condition upon said material mixing pan.

In testimony whereof, I have hereunto set my hand, this twenty-third day of August, 1920.

HERMAN P. ANDRESEN.