N. M. ROSENDAHL.

FIRE BOX CONSTRUCTION.

APPLICATION FILED SEPT. 28, 1914.

1,209,886.

Patented Dec. 26, 1916.

2 SHEETS—SHEET 1.

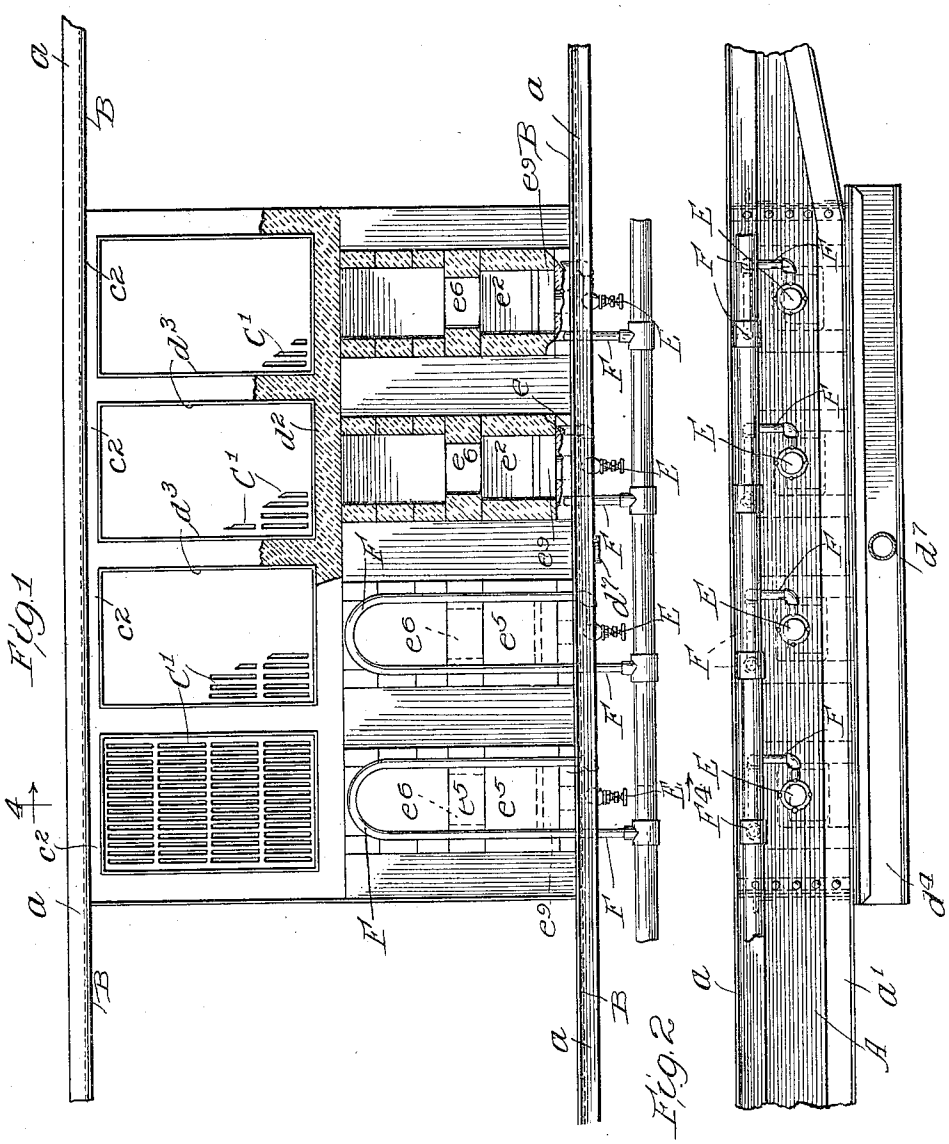


Fig. 1

Fig. 2

Witnesses
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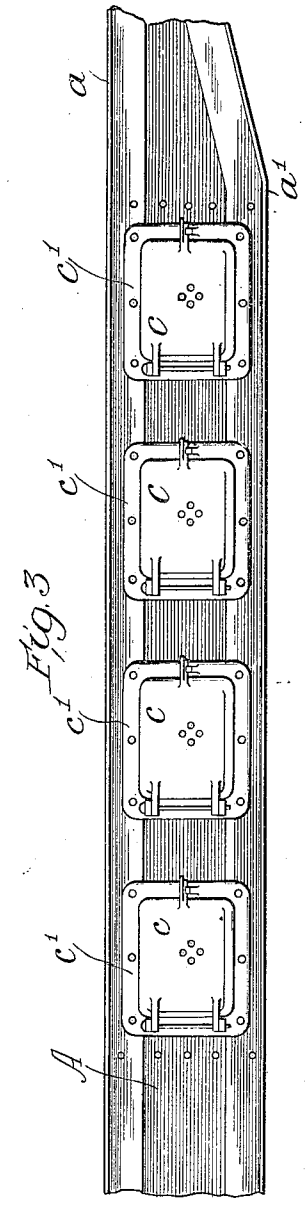


Fig. 3

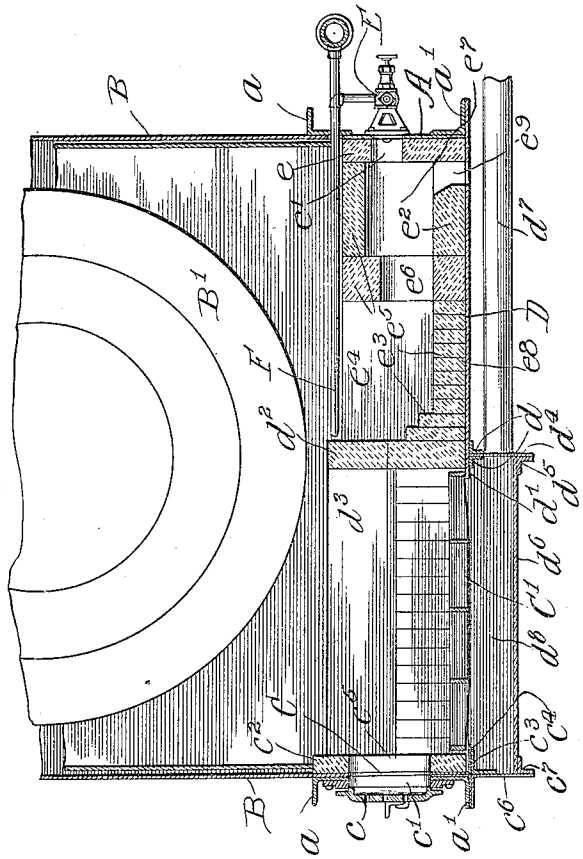


Fig. 4

Witnesses

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FIRE-BOX CONSTRUCTION.

1,209,886. Specification of Letters Patent. Patented Dec. 26, 1916.

Application filed September 28, 1914. Serial No. 863,849.

To all whom it may concern:

Be it known that I, NILS M. ROSENDAHL, a citizen of the United States of America, and residing at the corner of Whitney avenue and North Park avenue, Winthrop Harbor, Lake county, Illinois, have invented a certain new and useful Improvement in Fire-Box Constructions, of which the following is a specification.

My invention relates to fire boxes for portable asphalt mixing machines.

The principal object of my invention is to provide a portable asphalt mixing machine having a fire box of such character that various kinds of fuel can be used, depending upon the circumstances and conditions, as well as the requirements of different localities.

Generally stated, therefore, my invention contemplates a machine of this kind having a fire box which will burn either coal or wood or coke or oil or any other fuel. Consequently, with an asphalt mixing machine having a fire box constructed in accordance with my invention, the fuel which is cheapest and most convenient can be employed; and, furthermore, if the work is being done in a neighborhood or a locality in which the burning of soft coal is not permitted, as in some residence districts, then wood or coke can be used for heating and drying paving materials.

In addition, my invention further contemplates a fire box for a machine of this kind which is built into the main under-frame, and which does not have to be removed; and by this construction and novel arrangement the fire is brought closer to the drier or rotary container of the machine, and for this reason the heat efficiency is increased to some extent.

It is also an object to provide certain details and features of construction and combinations tending to increase the general efficiency and serviceability of an asphalt mixing machine fire box of this particular character.

To the foregoing and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a plan of an asphalt mixing machine fire box embodying the principles of my invention, showing certain portions thereof in horizontal section. Fig. 2 is a side elevation of the said fire box, showing the side of the structure upon which the liquid fuel burners are mounted. Fig. 3 is a side elevation of the said fire box construction, showing the other side thereof—that is to say, the side having doors for the introduction of solid fuel. Fig. 4 is a vertical cross section on line 4—4 in Fig. 1.

As thus illustrated, my invention comprises a main under-frame A for supporting the various elements of the asphalt mixing machine, and which is in turn supported a suitable distance from the ground, by wheels, whereby the machine is portable and can be moved around from one place to another. This frame, as shown, comprises upper and lower angle irons a and a^1, these angle irons being spaced a distance apart vertically and secured to the side wall B of the body of the machine. It will be seen that these angle irons a and a^1 are duplicated at opposite sides of the machine, (see Fig. 4) and that the side walls B form a space between them for the rotary drier B^1, which latter may be of any suitable known or approved character. At one side of the machine the wall B is formed with openings C between the upper and lower angle irons a and a^1, and these openings are provided with fire doors of any suitable character, said doors being shown hinged to the door frames c^1 which are riveted or otherwise secured to the said angle irons. In this way the said door frames serve to strengthen and brace the main under-frame. Immediately inside of the openings C a fire wall c^2 extends along the surface of the wall B, this wall being made of some suitable refractory material, and having its lower edge supported on a shelf c^3 at the bottom of the main frame. A plate D is secured to the underside of the angle iron a^1 at the other side of the machine, and is supported centrally of the fire box structure by a pair of angle irons d suitably secured together and connected with the main under-frame. The projecting edge d^1 of the plate D forms a shoulder for supporting the grates C^1, the other ends of said grates being supported on the shoulders c^4 that project from the shelf c^3, the latter being formed by an angle iron or in any other suitable manner.

A central wall d^2 of refractory material extends longitudinally of the fire box construction, above the angle irons d, and transverse walls d^3, of suitable refractory material, connect the walls d^2 with the walls c^2,

whereby the space between said latter walls is divided into a number of compartments or combustion chambers. Under each one of these chambers, it will be seen, there is a grate C^1, it being understood that said grates may be of any suitable form or construction. The arrangement is also such, it will be seen, that each one of said combustion chambers has a door c and an opening C for feeding fuel to the fire box; and in this connection it will be seen that the wall c^2 is provided with openings c^5 which are directly opposite the openings C, whereby access is afforded to the interior of the fire box by way of said doors.

A vertical plate c^6 is hung from the angle iron a^1, at the outer side of the machine, and a similar plate d^4 is hung from the angle irons d, and upon these plates angle irons c^7 and d^5 are suitably secured to provide supporting shoulders for the horizontal plate d^6 which forms a support for the ashes which drop from the grates. To create a forced draft a blow pipe d^7 is connected with an opening in the plate d^4, whereby air may be communicated to the chamber d^8 below the grates.

At the other side of the machine said main under-frame A has the wall B thereof provided with openings between the angle irons a and a^1 and for each said opening there is a liquid fuel burner E of any suitable known or approved character; and, if desired, these burners may be adapted for using gas instead of oil. The wall e of refractory material, is disposed immediately inside of the comparatively thin side wall B, and is provided with openings e^1 for the said burners E, whereby the flame from each burner is directed into the fire box. The refractory material e^2 is supported on the bottom plate D, being provided with shoulders e^3 for deflecting the flame and heat upwardly against the wall d^2; and it will also be seen that the space between the walls d^2 and e is divided by transverse walls e^4 into a plurality of compartments or combustion chambers, there being one of these combustion chambers for each of said fuel burners. The walls e^4 are connected by arches e^5, there being a somewhat restricted opening e^6 between the compartments e^7 and e^8 of each combustion chamber thus formed. The bottom of each compartment e^7 is provided with an opening e^9 for the admission of air, or for the removal of any accumulations which may form within the said compartment. Thus the oil or other fluid fuel is projected in a burning condition into the compartments e^7, and the heat and products of combustion are then allowed to escape through the openings e^6 into the compartments e^8, which latter, it will be seen, are below the rotary drier B^1, and with this construction the heat produced from the fluid fuel is effectively and economically concentrated upon the bottom of the drier, and in such manner that the heat passes upwardly at each side of the said drier, thus rendering it possible to heat an asphalt tank arranged over the drier. A superheating pipe F, for any suitable purpose, such as heating the oil for the burners E, can be arranged over the compartment e^8 in the manner shown, or in any other suitable way.

With the foregoing construction and arrangement, it will be seen that provision is made for burning coal or wood or coke or other similar kinds of fuel at one side of the fire box, and that provision is made for burning oil or other fluid fuel at the other side of the fire box, whereby a portable asphalt mixing machine of this kind may employ the fuel that is cheapest or most convenient, or which is most satisfactory for other reasons. For example, it sometimes happens that coal cannot be burned in a certain locality such as a residence district, and in that event wood or coke can be used; and if solid fuels are not available, then oil or other fluid fuels can be used. Furthermore, the fire box, being built into the main under-frame, serves to bring the heat closer to the bottom of the drier, and in this way insures greater heat efficiency in the use of the machine. It will be understood, of course, that asphalt mixing machines of this kind are employed, for example, in the construction of street pavements, and are moved from place to place; and that for this reason the means for heating the asphalt, crushed rock, gravel, sand and other materials employed in the construction of the pavements is somewhat of a problem. The fire box construction shown and described, is, however, of such character that the heating problem is very much simplified.

Thus, a portable paving plant is provided which will burn either kind of fuel. But I do not limit myself to the exact construction shown and described.

What I claim as my invention is: —

1. In a portable paving-plant, a fire-box comprising a substantially flat metal main under-frame, composed of horizontally disposed longitudinal side-members adapted to support the entire fire-box in an elevated position above the ground, means for forming a combustion chamber between the sides of said frame, extending transversely thereof, a grate for said chamber, devices for supporting said grate on said frame, a fuel door in one side-member of said frame, a container for the materials to be heated, disposed immediately above said chamber, and means to burn a different kind of fuel at the other side of said fire box.

2. In a portable paving-plant, a fire-box comprising a substantially flat metal main under-frame, composed of horizontally dis-

posed longitudinal side-members adapted to support the entire fire-box in an elevated position above the ground, means for forming a combustion chamber between the sides of said frame, extending transversely thereof, a fluid burner disposed on the side of said frame and in position to direct the flame into said chamber, one of said members having an opening for said burner, a container for the materials to be heated, disposed immediately above said chamber, and means to burn a different kind of fuel at the other side of said fire box.

3. In a portable paving-plant, a fire-box comprising a main under frame, means for forming a combustion chamber between the sides of said frame, extending transversely thereof, a grate for said chamber, devices for supporting said grate on said frame, a fuel door in the side of said frame, and a container for the materials to be heated, disposed immediately above said chamber, said means including a fire wall for the inner end of said chamber, said frame having a second combustion chamber between said wall and the other side of the frame, the two chambers being arranged end to end, and a fluid burner for directing a flame into the second chamber, said frame having an opening for said burner.

4. In a portable paving-plant, a fire-box comprising a main under frame, means for forming a combustion chamber between the sides of said frame, extending transversely thereof, a fluid burner disposed on the side of said frame and in position to direct the flame into said chamber, and a container for the materials to be heated, disposed immediately above said chamber, said means including a back wall for said chamber, said frame having a second combustion chamber between said wall and the other side of the frame, a grate for the second chamber, the two chambers being arranged end to end, and a fuel door for the second chamber, located in the side of the frame, said first mentioned chamber having a bottom wall in the plane of said grate.

5. In a portable paving-plant, a fire-box comprising a main under frame, means for forming a combustion chamber between the sides of said frame, extending transversely thereof, a grate for said chamber, devices for supporting said grate on said frame, a fuel door in the side of said frame, and a container for the materials to be heated, disposed immediately above said chamber, said means including a fire wall for the inner end of said chamber, said frame having a second combustion chamber between said wall and the other side of the frame, the two chambers being arranged end to end, and a fluid burner for directing a flame into the second chamber, said frame having an opening for said burner, said wall being disposed centrally of said container, and side walls extending upwardly from said frame, the latter being of a length to accommodate a plurality of said chambers at each side thereof, the fire-box thus equipped for either solid or fluid fuel being built into said frame and supported thereby a distance above the ground.

6. In a portable paving-plant, a fire-box comprising a main under frame, means for forming a combustion chamber between the sides of said frame, extending transversely thereof, a fluid burner disposed on the side of said frame and in position to direct the flame into said chamber, and a container for the materials to be heated, disposed immediately above said chamber, said means including a back wall for said chamber, said frame having a second combustion chamber between said wall and the other side of the frame, the two chambers being arranged end to end, a grate for the second chamber, and a fuel door for the second chamber, located in the side of the frame, said first mentioned chamber having a bottom wall in the plane of said grate, the fire-box thus equipped for burning either solid or fluid fuel being built into said frame and supported thereby a distance above the ground.

7. In a portable paving-plant, a main under-frame provided with a fire box having means at one side to burn one kind of fuel and means at the opposite side to burn another kind of fuel, a combustion chamber which is common to both of said means, and a container arranged centrally of said chamber to extend over both of said means, one of said means including a plurality of fully-open-top-compartments extending approximately half-way under said container, and a support at the bottom of each compartment to burn solid fuel.

8. In a portable paving-plant, a main underframe provided with a fire box having means at one side to burn one kind of fuel and means at the opposite side to burn another kind of fuel, a combustion chamber which is common to both of said means, and a container arranged centrally of said chamber to extend over both of said means, one of said means including a plurality of partially-open-top-compartments extending approximately half-way under said container, and a fluid-fuel-burner for the covered-top-portion of each compartment.

Signed by me at Chicago, Illinois, this 18th day of September, 1914.

NILS M. ROSENDAHL.

Witnesses:
RACHEL J. RICHARDSON,
ROSE E. SEHNEM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."