July 8, 1930. G. A. COATS 1,770,024

PAVEMENT HEATER FLUE

Filed Sept. 8, 1926 2 Sheets-Sheet 1

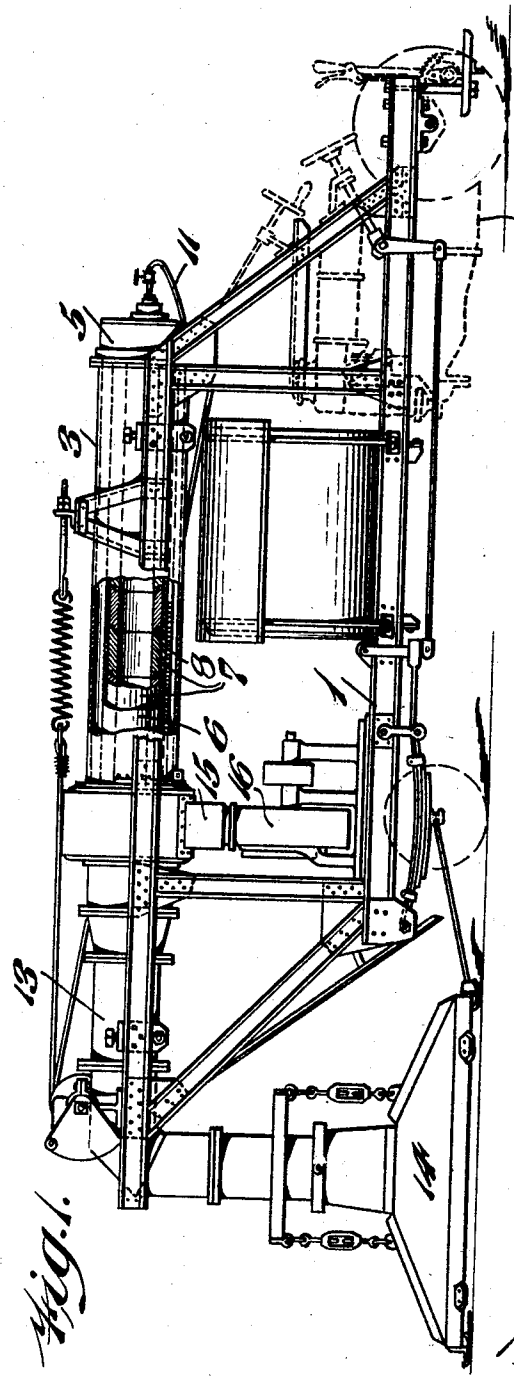


Fig. 1.

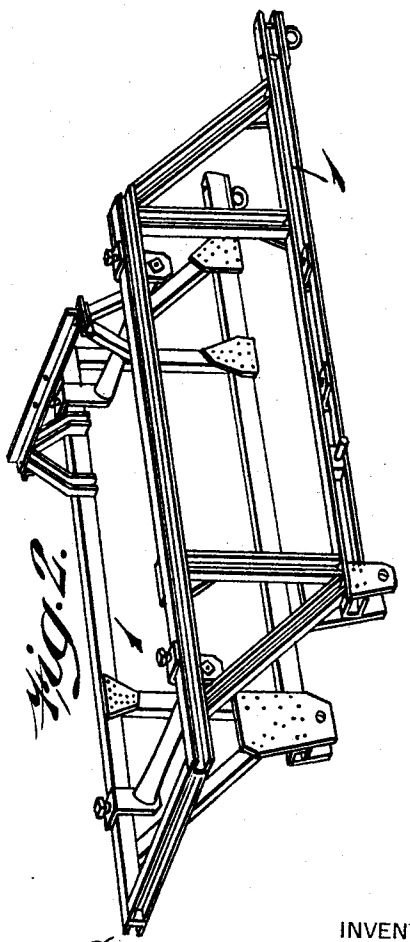


Fig. 2.

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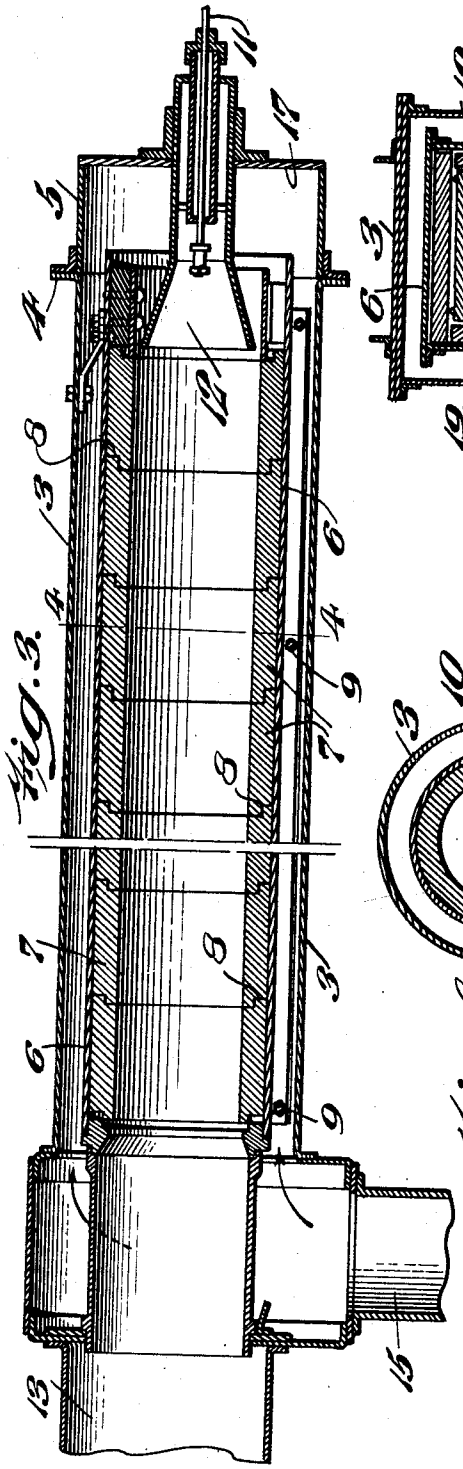


Fig. 3.

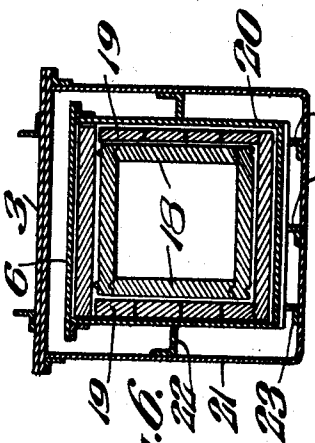


Fig. 6.

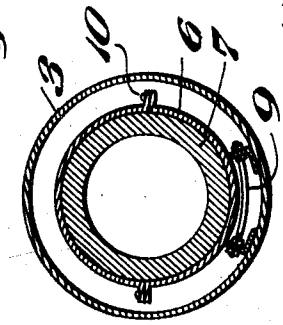


Fig. 4.

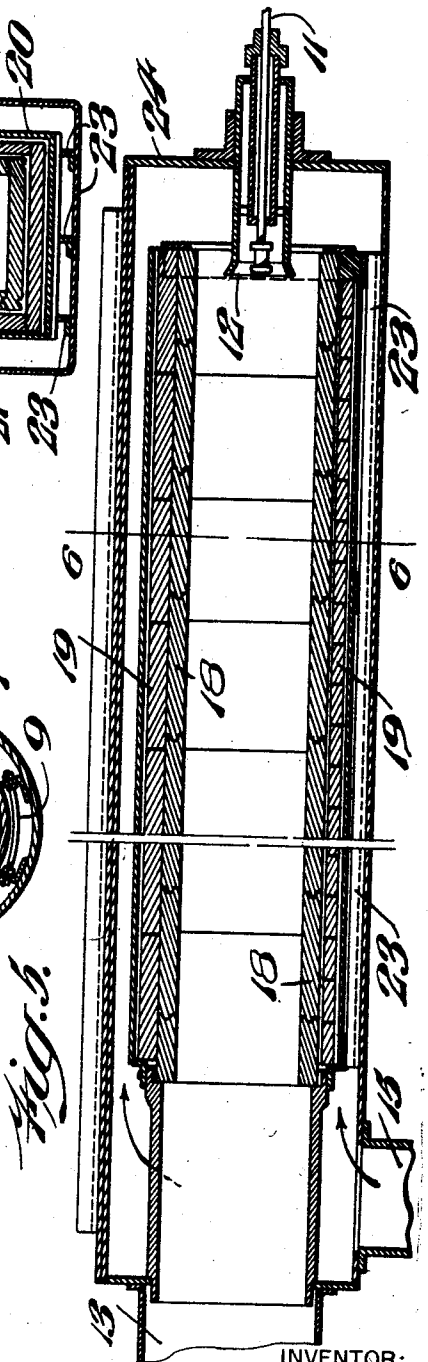


Fig. 5.

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UNITED STATES PATENT OFFICE

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PAVEMENT-HEATER FLUE

Application filed September 8, 1926. Serial No. 134,156.

This invention, stated in its broadest terms, relates to a pavement heater as mounted upon a tractor and has more especial relation to a flue supported in horizontal position upon a suitable frame carried by the tractor in order that fuel conveyed through an inner flue to the pavement heater proper is exteriorly cooled by a current of air travelling first in a direction opposite to the travel of the products of combustion and thereafter is commingled with the products of combustion.

The leading object of the present invention may be said to reside in the provision of a pavement heater of the character above stated in which the flue is comprised of an inner and outer flue part of which the inner flue is of sectional make-up and of refractory material.

A further object is to provide a flue of this character in which cooling air is forced around the inner flue first in a direction opposite to the travel of the products of combustion and which is then deflected into said inner flue where it mixes with the burning gases therein to improve combustion.

A still further object of the present invention is to provide an inner lining for an inner flue of the character stated in which the lining parts are of sectional character and have nested relation one with the other.

A still further object of the present invention is to provide a flue of the character stated in which concentric flues are provided of which the inner flue is of refractory material and is supported by a cradle carried within the outer flue.

A still further object of the present invention is to provide a structure of the character stated in which an inner and an outer flue are provided, one end of said outer flue being closed and provided with a fuel supply and the other end connected with a pavement heater and in which intermediate the above connections is provided a source of cooling air arranged for passage to the outer flue at the approximately point of termination of the inner flue.

A still further object of the present invention is to provide a structure of the character stated in which the said inner and outer flues are of rectangular cross-section and of which the inner flue is of sectional make-up and in two thicknesses, of which the innermost thickness is carborundum tiles and of which the outer thickness is fire brick tiles.

Other and further objects not at this time appearing will be hereinafter more particularly referred to.

The invention consists of the novel construction hereinafter described and finally claimed.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which:

Fig. 1, is a view in side elevation of a pavement heater of the tractor type equipped with a flue embodying the invention.

Fig. 2, is a view in perspective of the frame-work of the tractor for supporting said flue.

Fig. 3, is a fragmentary view principally in longitudinal section showing the details of construction of the flue.

Fig. 4, is a view in cross-section taken upon the line 4—4 of Fig. 3.

Fig. 5, is a view similar to Fig. 3 but illustrating a modified form of structure.

Fig. 6, is a view in cross-section taken upon the line 6—6 of Fig. 5.

For the purpose of illustrating my invention I have shown in the accompanying drawings two forms thereof which are at present preferred by me, since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

Referring to the drawings in detail, and with especial reference to Fig. 1, the reference numeral 1 designates a frame as carried by the tractor parts 2 (shown in dotted lines) which frame supports the flue of the inven-

tion. The flue is horizontally disposed, comprises an outer casing 3 preferably of sheet metal or the like, the flanged end 4 of which has fitted thereto a closure 5 and within which outer casing is located an inner casing 6 provided with a lining of refractory material made up of sections 7. These sections 7 of refractory material have nested relation as at 8 and are supported within the outer casing 3 by means of a cradle 9. It may be stated that the inner casing 6 is in two parts, secured together as at 10, as clearly shown in Fig. 4, the casing 6 being preferably of sheet metal or the like. The sections of refractory material 7 are tubular in form as also clearly shown in Fig. 4. The outer casing 5 at one end, or rather the cap 5 of the outer casing 3, is provided with a fuel inlet connection 11 which projects into a funnel shaped mixer 12 where the fuel is burned, the latter being projected well within the inner flue part, as clearly shown in Fig. 3. The opposite end of the outer casing 3 has extended therefrom a connection 13 in communication with a hood 14 of conventional form. Intermediate the hood 14 and the fuel connection 11 and connecting with the outer casing 3 is a connection 15 for supplying cooling air to the outer casing 3 for circulation around the inner casing 6. As clearly shown in Fig. 3 the cooling air forced by the blower 16 through the connection 15, passes in the direction of the arrows in Fig. 3 around the inner casing 6 within the outer casing 3 in a direction opposite to that in which the products of combustion pass from the burner 12 through the refractory lining of the inner flue to the hood 14. Thus, as the air from the blower 16 circulates around the inner flue it tends to cool the inner flue and prevent undue heating thereof and as it impinges against the closed end 17 of the cap 5 it is deflected toward the left in Fig. 3 and enters the inner flue 6 to improve combustion whence it is forced out through the connection 13 together with air for supplying the products of combustion into the hood 14. By having the cap 5 removable and having the inner flue supported upon the cradle 9, it is very easy by removing cap 5 to remove the refractory lining in an endwise direction for replacement or repair when necessary. In practice the inner and outer casings of the flue are supported by the frame work 1 shown in Fig. 2 in horizontal position above the working parts of the structure and its various adjuncts.

The construction shown in Figs. 5 and 6 is substantially that as above described with the exception that the inner and outer casings are of rectangular cross-section as is the lining for the inner flue, and in that the lining for the inner flue is of two thicknesses of which the inner thickness, designated 18, is of carborundum tile, and the other thickness is of fire brick tile and is designated 19. As clearly shown in Fig. 6 these two thicknesses of refractory material are of rectangular cross-section and are arranged within an inner flue 20 and the inner flue 20 is spaced from the outer casing 21 by means of brackets 22. Instead of supporting the inner flue upon a cradle as before described, angle irons 23 are provided upon the bottom of the outer casing 21 upon which angle irons 23 the inner casing 20 is supported. While the end of the casing 21, as shown in Fig. 5, is closed as at 24 the part 24 is not in the form of a cap as shown in Fig. 3.

What I claim is:

1. In a device for pavement heating, an inner, elongated, unobstructed flue forming a combustion chamber and having an intake end and an exit end, means for admitting fluid fuel to the intake end of said flue, a sectional lining of refractory material inside of said flue, the lining sections having rabbeted connections, an outer metal casing surrounding said flue to form an air passage therearound, and having the end thereof at the intake end of said flue closed, and the opposite end open, and air forcing means connected with the open end of said outer casing near the exit end of said flue, adapted to force air through said air passage toward the closed end of said outer casing to cool said flue, said air being thus heated and deflected by the closed end of said outer casing into the intake end of said flue to commingle with said fuel to support combustion.

2. In a device for pavement heating, an inner, elongated, unobstructed flue, forming a combustion chamber and having an intake end and an exit end, means for admitting fluid fuel to the intake end of said flue, a sectional concentric lining of refractory material inside of said flue, the lining sections having rabbeted connections, an outer metal casing surrounding said flue to form an air passage therearound, and having the end thereof at the intake end of said flue closed and the opposite end open and extending beyond said flue to form a support for the fuel admitting means, a blower operatively connected with the open end of said outer casing near the exit end of said flue, and adapted to force air through said outer air passage toward the closed end of said outer casing to cool said flue, said air flowing in an opposite direction to the products of combustion and being thus heated and deflected by the closed end of said outer casing into the intake end of said flue to commingle with said fluid fuel, a vertically adjustable hood and a conduit leading from the exit end of said flue into said hood for conveyng the products of combuston thereinto.

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