

J. P. ELMER.  
CAR HEATER.  
APPLICATION FILED FEB. 28, 1910.

997,978.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

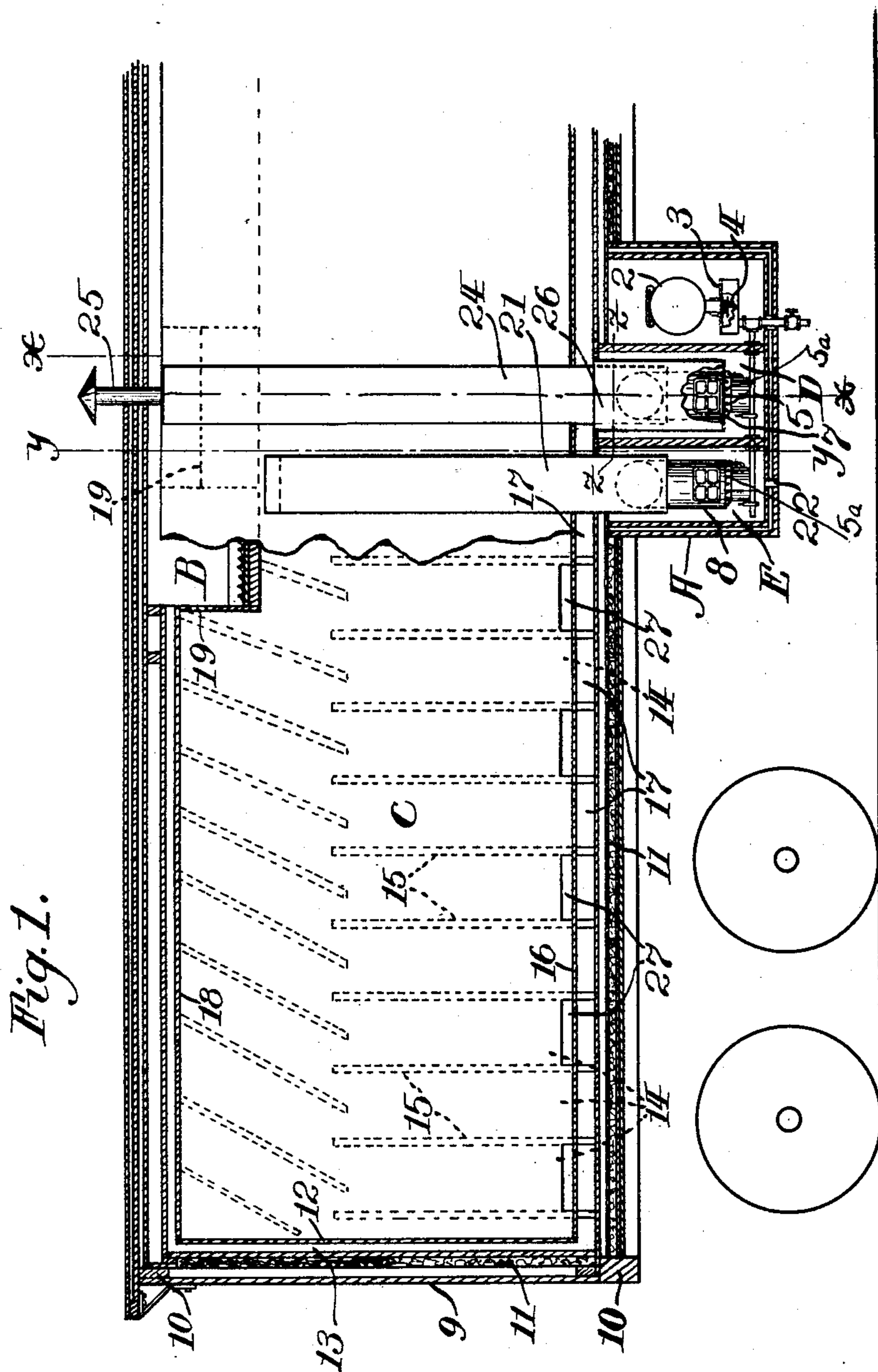


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

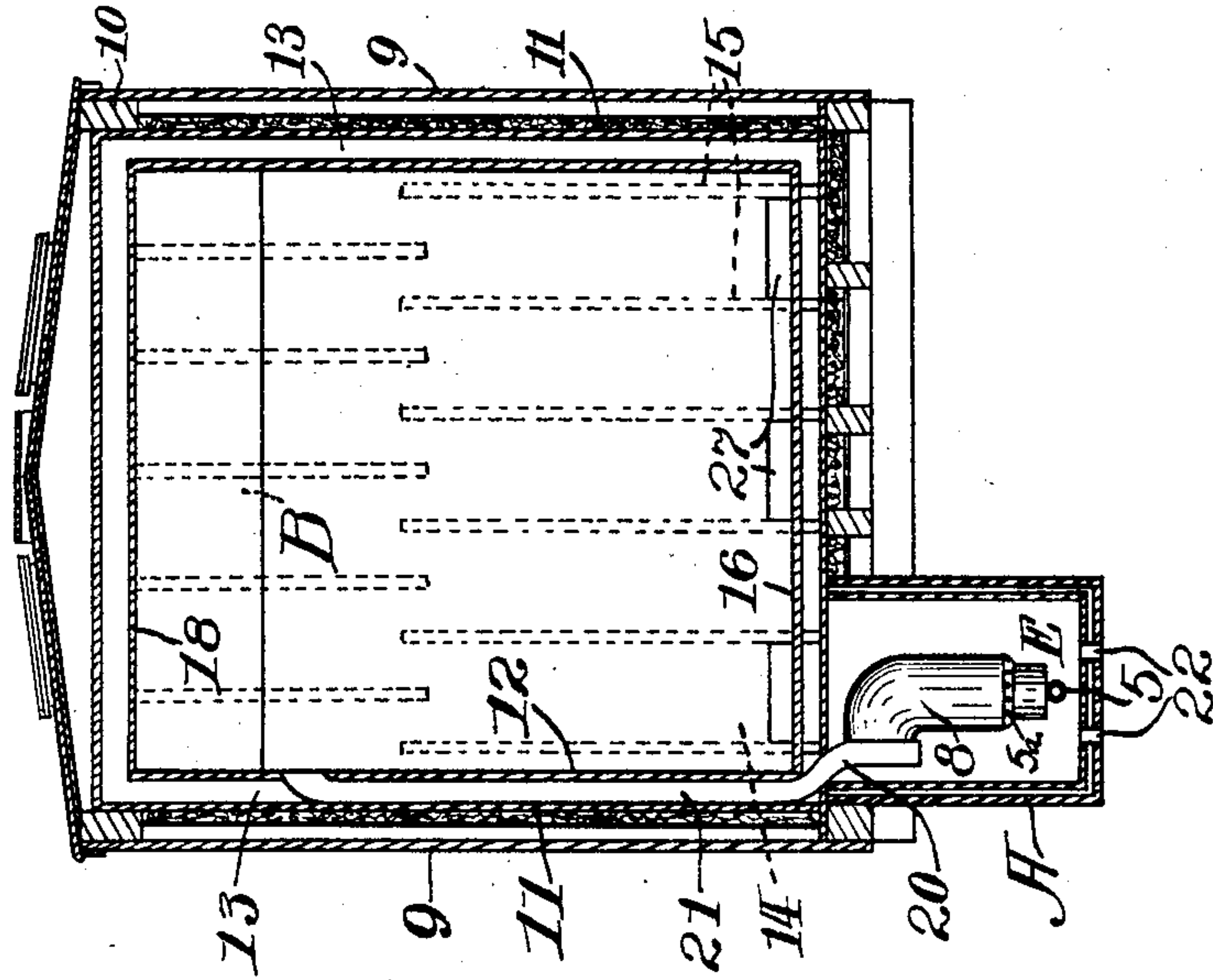


Fig. 2.

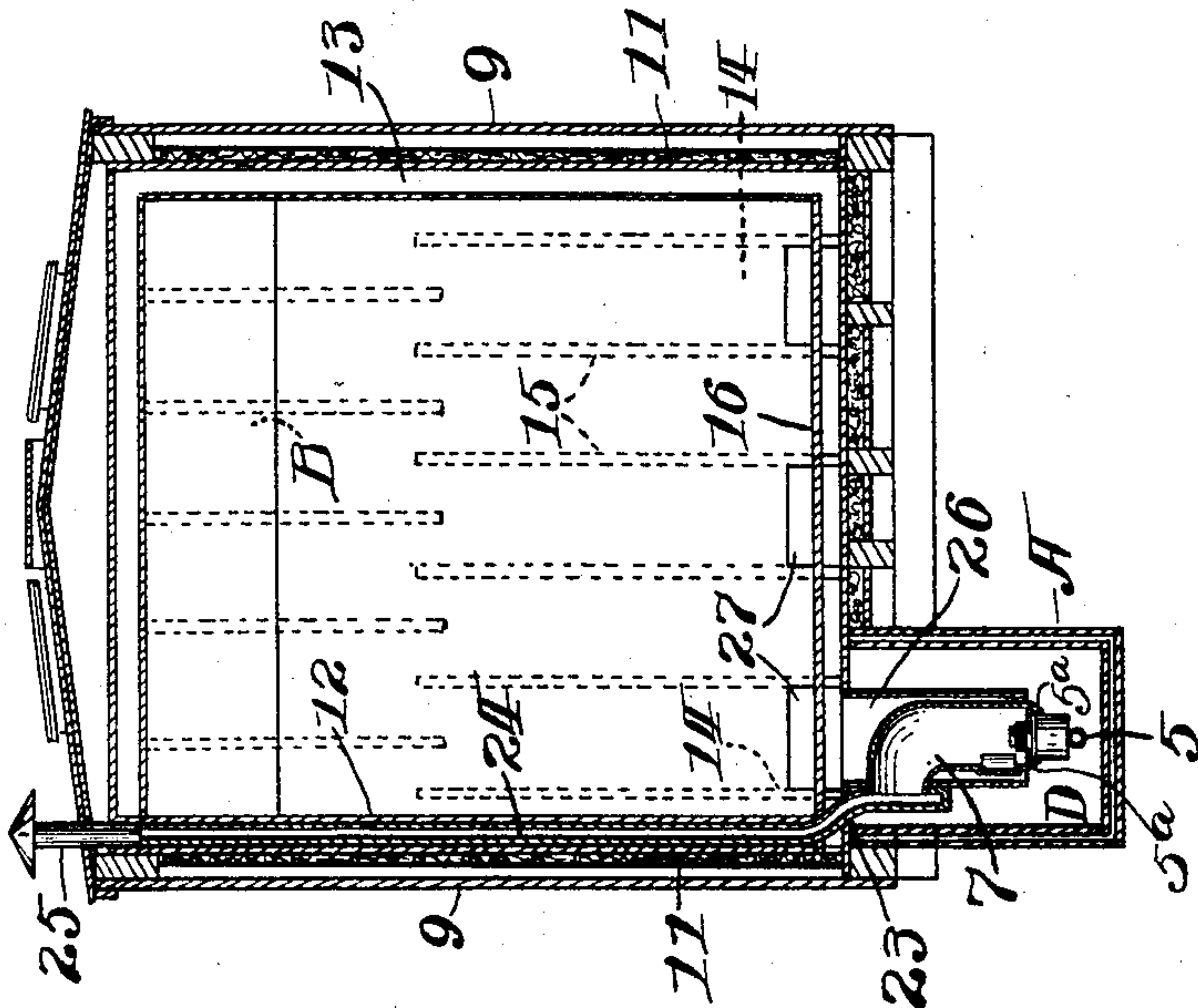
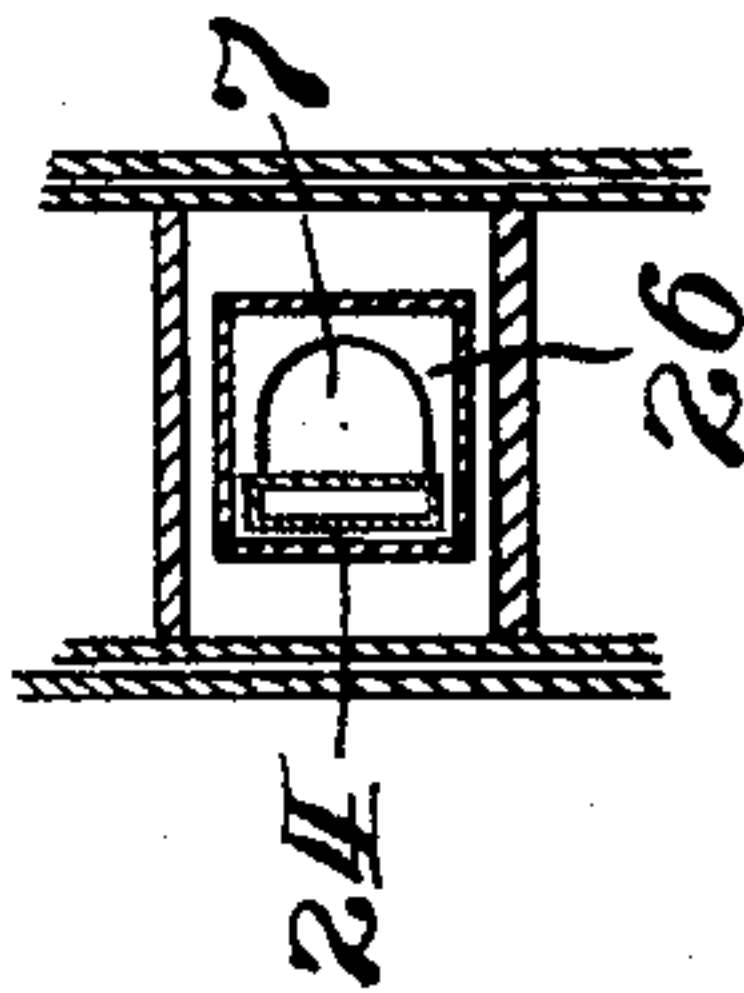


Fig. 1.



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# UNITED STATES PATENT OFFICE.

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## CAR-HEATER.

997,978.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed February 28, 1910. Serial No. 546,495.

*To all whom it may concern:*

Be it known that I, JAMES P. ELMER, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Improvement in Car-Heaters, of which the following is a specification.

My invention relates to improvements in car heaters of the class applied to freight cars and especially adapted for use in connection with insulated freight cars, intended to be laden with perishable commodities which require protection from heat in summer and cold in winter. Its object is to provide practical and economical means for heating and ventilating a car of the class described, by displacing cold, foul air with warm and substantially pure air. Briefly, I accomplish this purpose by withdrawing the foul, cold air through one heating drum and a flue leading outside the car and replacing it with fresh, warm air furnished through a second heating drum and flue.

In the drawings, Figure 1 is an elevation of one end of an insulated car, including my improved heater, part of the outer wall of the car being broken away. Fig. 2 is a sectional view on the line X—X of Fig. 1, looking toward the heater. Fig. 3 is a section of Fig. 1, on the line Y—Y looking toward the heater. Fig. 4 is a sectional detail on the line Z—Z of Fig. 1.

Beneath the car body, I provide a heater box A, adapted to receive the lamps or stoves used for furnishing heat. I prefer to use for this purpose central draft burners having an automatic feed like those common in student lamps. The upper fuel reservoir 2, lower reservoir 3, pin valve 4 between said reservoirs, tube 5 leading from the lower reservoir to the burners (not shown), and the drums 7 and 8 surrounding the burners, are all of ordinary construction. The heating drums 7 and 8 are respectively placed in separate chambers D and E of this heater box for the reasons hereinafter fully explained, and the box A is supplied with a closely fitting door or other suitable closure to permit access to the heater.

The car body consists of the usual outer siding 9, frame 10, and insulation 11, and is also provided with an inner lining 12 separated from the frame 10 and insulation 11 by an air space 13. This air space 13 in the sides and end of the car is divided into sectional air passages 14, by battens 15.

These air passageways 14 alternately open above and below the floor 16, and those which extend below the floor also connect with similar passageways 17 below the floor. The passageways 14 also open into like passageways above the ceiling 18 and thence into the central, overhead ice bunker or air chamber B, which has perforations 19 into the freight chamber C as shown in Fig. 1 of the drawing.

Connected with the heating drum 8 is an elbow pipe 20 opening into the flue 21, which extends between the insulation 11 and lining 12 of the car to a point above the load line where it opens into the freight chamber C through the lining 12. The chamber E of the box A in which the drum 8 is placed has no air connection with the car body, but oxygen is supplied to the flame through the openings 5<sup>a</sup> in said drum by the apertures 22 through the floor of the chamber.

The drum 7 opens through the elbow 23 into the flue 24, which is preferably placed between the lining 12 and insulation 11, and extends to the top of the car opening into the outer air through a chimney 25. Obviously, however, this opening into the outer air may be under the eaves of the car instead of through the roof if desired. The chamber D of the heater box in which the drum 7 is placed has no opening into the outer air, but is provided with a flue 26 opening at its upper end through the air passageways 14 into the freight chamber, and at its lower end into the chamber D below the drum 7. The function of the burner in this drum is to establish a draft, withdrawing through the passageways 14 through the openings 5<sup>a</sup> and consuming cold and vitiated air from the freight chamber and thus giving place to the heated fresh air supplied by the burner 8.

The operation of my heater is as follows: The chamber D of the heater box is in substantially air-tight connection with the intercommunicating air passageways within the walls of the car, and these passageways open into the car body or freight chamber through the bunker B and openings 27. The action of the burner in this chamber D is therefore to draw its supply of oxygen from the freight chamber, reduce the air pressure in such chamber, and discharge the vitiated air and products of combustion into the outer air. The partial vacuum thus created in the freight chamber is filled by the fresh,



heated air supplied through the flue 21 from the drum 8, the flame in which is constantly furnished with outside air through the apertures 22. As is well known, a central draft  
 5 oil burner having an automatic feed like that which I have described, produces a minimum of fumes and odor. A strong draft is produced in the flue 21, resulting from the combined effect of withdrawing  
 10 the cold air from the car through the drum 7 and the upward current of heated, fresh air through the drum 8 produced by the burner therein and therefore large quantities of fresh, warm air are constantly taking  
 15 the place of cold, vitiated air drawn out through the drum 7 and its chimney. Thus the freight chamber is ventilated as well as warmed by my improved heater. It is to be noted in this connection that the use of  
 20 a common fuel supply for both central draft burners, furnished by the double reservoir connected by the pin valve, results in a constant, uniform flame and relatively complete combustion.

25 Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A car body inclosing a freight chamber, said car body being provided with intercommunicating air passages surrounding  
 30 and in communication with said freight chamber, in combination with a heater below the car body comprising a plurality of heating chambers and a single fuel reservoir,  
 35 an air flue connected with such air passages and with one of said chambers, and a chimney leading to the outer air from said heating chamber, another of said heating chambers being in communication with the outer  
 40 air and having a drum in communication therewith and with the freight chamber, and a burner in each of said heating chambers.

2. A car body inclosing a freight chamber, said car body being provided with intercommunicating air passages surrounding  
 45 and in communication with said freight chamber, in combination with a heater below the car body comprising a plurality of separate heater chambers, a burner in each  
 50 of said chambers, and a common source of liquid fuel supply, with air communication between said chambers and burners respectively, one chamber being provided with an air flue communicating with said  
 55 air passages while the second chamber is provided with an air opening beneath the car, each of said chambers having a heating drum communicating therewith, the first opening through a flue and chimney into the  
 60 outer air and the second communicating through a flue with the freight chamber.

3. An insulated car body provided with intercommunicating air passageways between the siding and vertical lining thereof  
 65 and in communication with the interior of

the car, in combination with a heater comprising a common source of liquid fuel supply, a plurality of drums with a burner in each, one of said drums being provided with an air flue communicating with said air  
 70 passageways and also with a flue and chimney leading to the outer air, while a second drum is provided with a flue communicating with the interior of the car, and is also in communication with the outer air. 75

4. In a device of the class described, an insulated car body, provided with intercommunicating air passageways within the walls, below the floor and above the ceiling thereof in communication with the interior  
 80 of the car, in combination with a heater box, below the car body, comprising two heater chambers, one chamber being provided with an air flue communicating with said air passageways and having a flue and chimney  
 85 leading to the outer air, while the second chamber is provided with an air conduit opening outside the car and with a heating-drum communicating with said chamber and which is connected with a flue opening into  
 90 the interior of the car body, and a source of heat in each of said heater chambers.

5. The combination of an insulated car body, having intercommunicating air passageways surrounding the freight chamber  
 95 and in communication therewith, of a heater comprising a source of fuel supply, a plurality of drums with a burner in each, one of said drums being provided with an air flue communicating with said air passageways and also with a flue and chimney leading to the outer air, while a second drum is provided with a flue communicating with the interior of the car and is also in communication with the outer air. 100 105

6. A car body inclosing a freight chamber, said car body being provided with intercommunicating air passageways surrounding and in communication with said freight chamber, in combination with a heater below the car body, comprising a common source of liquid fuel supply, two heater chambers, separated by an impervious wall, and a burner in, and receiving air from, each chamber respectively, one chamber being  
 110 provided with an air flue communicating with said air passageways and having a flue and chimney leading to the outer air, while the second chamber is provided with an air opening from outside the car and is  
 115 supplied with a heating drum and flue opening into the interior of said freight chamber. 120

7. In a device of the class described, an insulated car body provided with intercommunicating air-passageways within its walls and in communication with the interior of the car, in combination with a plurality of heater chambers with heating means in each, means for supplying fresh air and trans- 125 130



mitting it to the interior of the car through one of said chambers, and means for removing foul air from the interior of the car and delivering it through said passageways and  
5 a second heater chamber to the outer air.

8. The combination with a car body, having air passageways in its walls, of a heater, comprising two heater chambers and a source of heat in each of said heater chambers, one  
10 chamber being provided with a ventilating flue communicating with said air passageways and having a chimney leading to the

outer air, while the second chamber is provided with an air conduit opening outside the car and with a flue opening into the interior of the car body. 15

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES P. ELMER.

Witnesses:

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

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