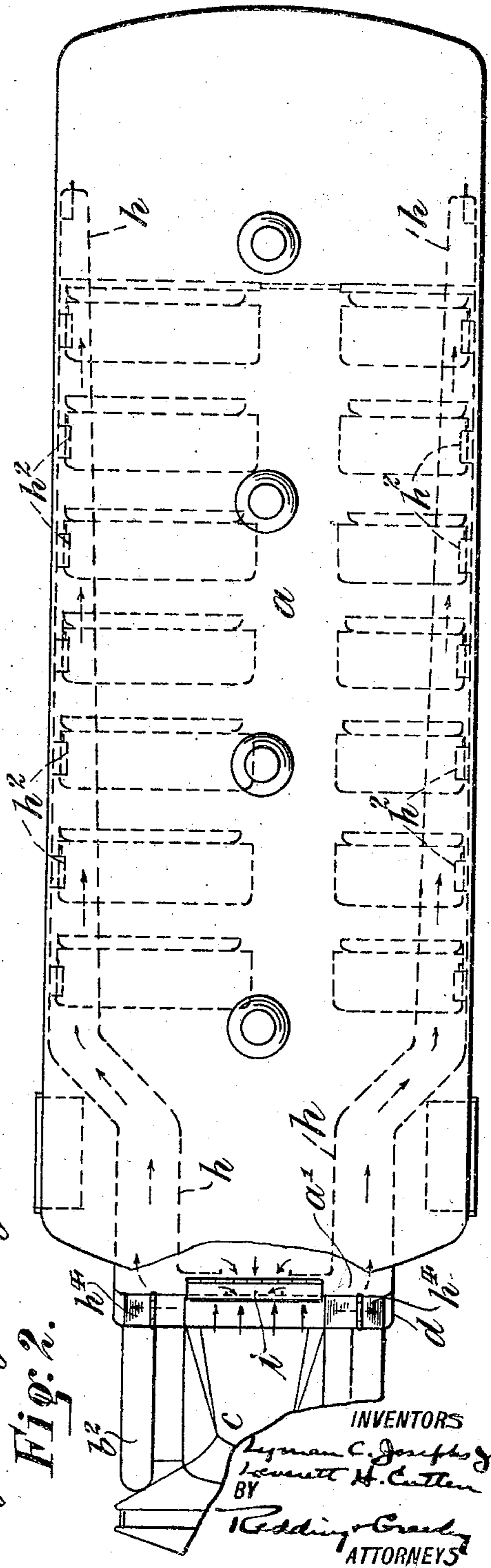
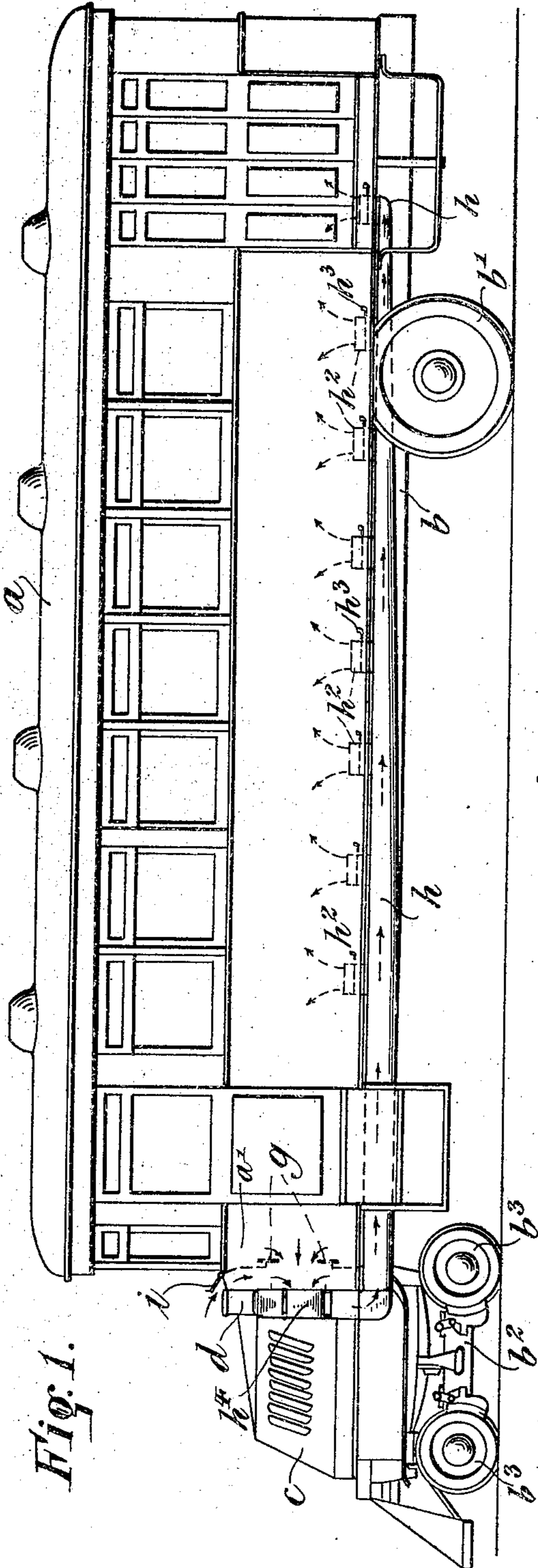


Jan. 2, 1923.

1,440,781

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HEATING AND VENTILATING MEANS FOR MOTOR PROPULSED CARS.
FILED MAR. 3, 1922.

2 SHEETS-SHEET 1



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2 SHEETS-SHEET 2

Fig. 3.

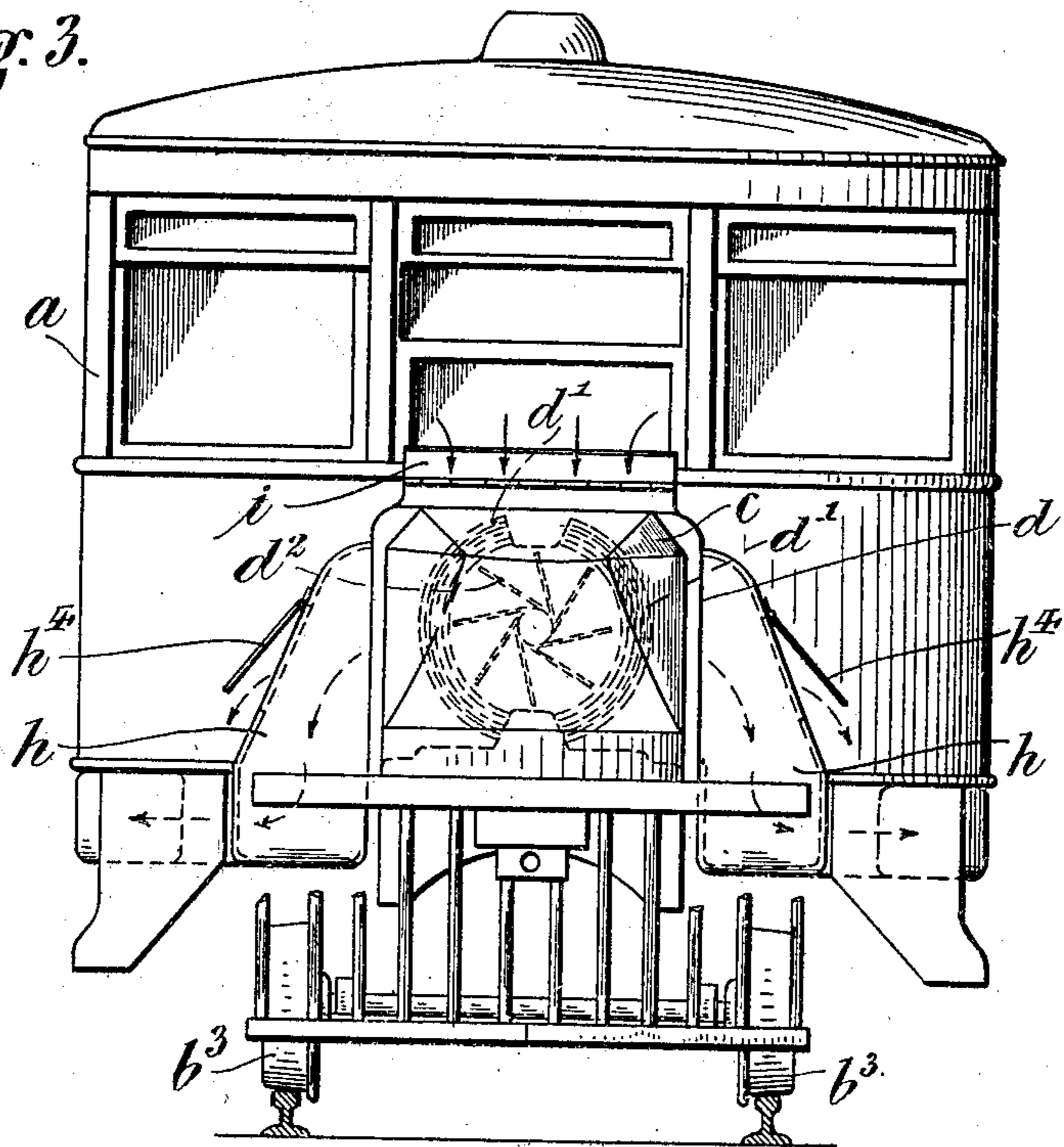
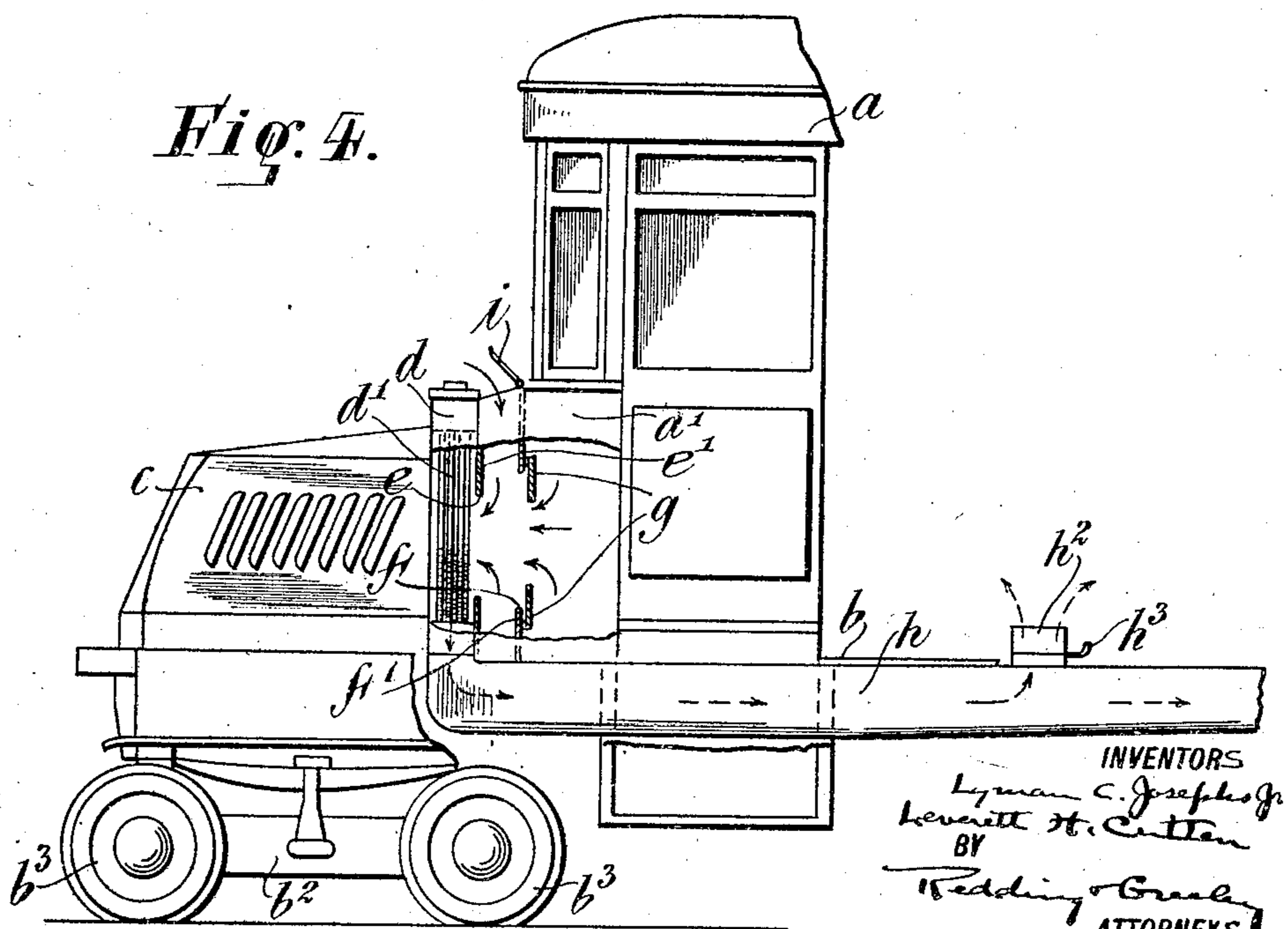


Fig. 4.



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UNITED STATES PATENT OFFICE.

LYMAN C. JOSEPHS, JR., AND LEVERETT H. CUTTEN, OF ALLENTOWN, PENNSYLVANIA, ASSIGNORS TO INTERNATIONAL MOTOR COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

HEATING AND VENTILATING MEANS FOR MOTOR-PROPELLED CARS.

Application filed March 3, 1922. Serial No. 540,685.

To all whom it may concern:

Be it known that we, LYMAN C. JOSEPHS, JR., a citizen of the United States, and LEVERETT H. CUTTEN, a subject of the King of Great Britain, residing in Allentown, in the State of Pennsylvania, have invented certain new and useful Improvements in Heating and Ventilating Means for Motor-Propelled Cars, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The problem of heating the bodies of cars propelled by internal combustion engines should find its solution, it is believed, in the transference of heat from the propelling motor to the car. The difficulty of delivering heat from the motor to the car efficiently and in useful form is recognized in the art and known attempts have not been satisfactory. The present invention proposes to transfer heat from the motor to air which may be constantly circulated and recirculated from the heating medium through the car body. More particularly, the invention proposes that the air to be heated shall pass over the radiator coils through which is constantly circulated water heated by the motor. This solution leads to the real inventive thought which resides in making available the conventional water cooling radiator of the motor as a heating medium for the air and the employment of the conventional radiator fan as a circulating element for the heating air. In practice, it has been found impracticable to realize the objects of the present invention in a construction where the radiator is mounted in front of the motor and so the preferred embodiment of the invention will find this radiator mounted in rear of the motor and in communication with both the motor bonnet and the car body.

A further object of the invention is to provide a heating system of the character described which shall serve equally as an effective ventilating system for the car body in both summer and winter, the action being such as to insure, in a controllable manner, the constant movement of air of a predetermined temperature through the body of the car and the maintenance, within limits, of a predetermined temperature of the water within the radiator coils.

In accordance with the invention the radiator and its fan may be placed in communication with the car body by means of adjustable dampers and the car body may be placed in communication with the atmosphere through suitable dampers to the end that the current of warm air may have commingled therewith any desired volume of air at atmospheric temperature. Further, the radiator may have its coils placed in direct communication with the atmosphere through adjustable dampers to permit the direct discharge of heated air rather than its circulation through the car body. By means of the dampers indicated any desired conditions affecting either the heating or ventilation of the car body in either summer or winter may be obtained and the cooling of the motor governed for greatest efficiency.

Other features of the system and incidental advantages will appear with greater particularity hereinafter in connection with the detailed description of the preferred embodiment illustrated in the accompanying drawings herein:—

Figure 1 is a conventional view in side elevation of a motor propelled car having the improved heating and ventilating system incorporated therein.

Figure 2 is a view in plan of the car shown in Figure 1.

Figure 3 is a view in front elevation thereof.

Figure 4 is a detail view in side elevation of a fragment of said car with the cowl broken out in the interest of clearness.

As the description proceeds it will be evident that the invention is not limited in any respects to the character of the car in which the system is incorporated though it is true that the most practicable embodiment thereof will be found in a construction where the radiator is placed at the rear of the motor and communicates with the car body. As shown in the drawings the body *a* is mounted on a chassis *b* which is supported by flanged traction wheels *b*¹ and a bogey truck *b*² having flanged car wheels *b*³. The internal combustion engine which propels the car is mounted on the chassis *b* at the front end thereof, in accordance with usual practice and is housed within the bonnet *c*. The radiator *d* for the motor is disposed at the rear thereof and includes the coils *d*¹ and the fan

d^2 disposed within the coils. Extending rearwardly from the radiator is the cowl a^1 . The type of fan d^2 employed is one which draws in the air centrally thereof and throws it out radially.

Broadly speaking, the invention contemplates the transference of heat from the propelling motor to the car body by means of air heated by the motor. The heating of the air can be done most effectively by passing it over coils which radiate heat from warm water circulating therethrough and first heated by the motor. Such a heating medium might not be an element of the cooling system of the motor itself but in adapting the invention to practical use it is proposed to employ the conventional radiator d in accomplishing the desired heat transference. Further, it is proposed to employ the fan d^2 of the radiator as a circulating element for the heated air which is to be passed constantly through the car body and over the heating coils d^1 . This fan d^2 is, accordingly, normally in communication with the interior of the car body as through an opening e in a dash plate e^1 and through an opening f in a second dash plate f^1 , which last-named opening may be closed or opened to any desired extent by adjustable dampers g movable by the car-man. The air drawn in centrally of the fan d^2 and thrown out radially thereby across the tubes d^1 is led by ducts h on opposite sides thereof lengthwise of the body from whence it is discharged into the body through one or more registers h^2 controllable by dampers h^3 . So much of the system as has been described would provide for the constant circulation and recirculation of the heated air from the car body over the coils d^1 , these coils being called on only to provide sufficient heat to make up for the heat losses suffered by the air during its circulation. Heated air from the motor also passes constantly to the fan d^2 and is likewise thrown out by it over the coils d^1 .

In weather which is not extreme it may be desirable to temper and freshen the heated air which is in constant circulation by admitting to it a stream of air directly from the atmosphere. A convenient means for effecting this cooling is shown conventionally as a cowl shutter i controlling the admission of atmospheric air to the space between the dash plates e^1 and f^1 . This shutter i is under the control of the car-man and may be closed or opened to any desired extent. As indicated by the arrows in Figures 1 and 4 the air passing the shutter i commingles with the air from the car body before the latter is picked up by the fan d^2 . In this condition of operation some of the warm air within the car body may escape therefrom through suitable ventilators provided therefor.

In the third condition to be taken care of it may be supposed that the weather is extremely mild, as in summer, and the cooling and ventilation of the car is desired to the exclusion of any hot air currents. In the improved system the passage of heated air from the coils d^1 into the car may be prevented by providing shutters h^4 in the ducts h preferably opposite the coils d^1 so that the air passing over the coils will escape freely into the atmosphere when the shutters h^4 are opened. In such a case the heated air will not pass rearwardly through the longitudinal ducts h under the car body. However, the fan d^2 will act constantly to draw air from the car body so as to maintain a constant circulation of the air passing into the body through suitable ventilators. The system, therefore, serves as an admirable cooling and ventilating arrangement for the body.

As described, it will be understood that the heat from the motor is made available for the purpose of maintaining the air currents within the car body at a predetermined temperature and replacing the heat losses thereof. The coils of a radiator for the motor placed at the rear thereof enable this heat transference to be conveniently and efficiently accomplished.

The fan for such a radiator further serves as a convenient blower for drawing air from the car body and forcing such air after additional heating, if desired, back to the car for recirculation. This same fan operating in a similar manner may serve as a ventilating element where it draws in additional cool air from the atmosphere or, in hot weather, expels air from within the car into the atmosphere in a steady stream. Taking into account the prevailing atmospheric temperatures and the temperature required within the car body, just so may the controlling temperatures be regulated to insure the maintenance of a predetermined temperature of the cooling water passing through the tubes d^1 . This measure of control enables the operator to keep the engine working at the most efficient temperature.

Changes in details of design and a rearrangement of the parts which do not affect the principles underlying the successful practice of the invention may be made without departing therefrom provided the results sought for are obtained by means which fall within the scope of the appended claims.

We claim as our invention:

1. In a motor propelled car in combination with the body and radiator for the motor a fan within the radiator adapted to draw air from the car body and pass it through the radiator, and ducts through which said air passes from the radiator into the car body.

2. In a motor propelled car in combina-

tion with the body, a radiator for the motor, disposed at the rear thereof and communicating with the interior of the body, a fan disposed within the radiator to draw air
5 from the body and throw it out over the tubes of the radiator, means to control the volume of air passing from the car body to the fan and ducts through which the heated air passes from the radiator coils into the
10 body.

3. In a motor propelled car in combination with the body and radiator for the motor, a fan within the radiator adapted to draw air from the car body and pass it through
15 the radiator, ducts through which said air passes from the radiator into the car body and means to admit to the air passing from the car body to the fan a stream of atmospheric air.

20 4. Heating and ventilating means for a motor propelled car including, in combination with the body, a radiator for the motor disposed at the rear thereof, a fan disposed within the radiator and communicating with
25 the car body to draw air therefrom and throw it out over the radiator tubes, two plates mounted in spaced relationship in proximity to the radiator and provided with openings through which the air passes from

within the body to the fan and a shutter to
30 control the admission of atmospheric air into the space between said plates.

5. Heating and ventilating means for a motor propelled car including, in combination with the car body, a radiator for the
35 motor disposed at the rear thereof, a fan disposed within the radiator to draw air from the car body and throw it out over the tubes of the radiator, ducts through which the air passes from the tubes into the car body, and
40 adjustable shutters opposite the tubes to permit the free escape of the air from the tubes into the atmosphere.

6. In a motor propelled car in combination with the car body, a radiator disposed
45 at the rear of the motor, a fan to draw air from the car body and throw it out over the tubes of the radiator, a shutter to admit atmospheric air to the air passing from the car body to the fan, ducts through which the air
50 passes from the tubes to the car body and adjustable shutters to permit the free escape of the air from the tubes into the atmosphere.

This specification signed this 27th day of
February, A. D. 1922.

LYMAN C. JOSEPHS, JR.
LEVERETT H. CUTTEN.