

(No Model.)

2 Sheets—Sheet 1.

W. H. PLUMB.

APPARATUS FOR HEATING RAILWAY CARS.

No. 383,247.

Patented May 22, 1888.

Fig. 1.

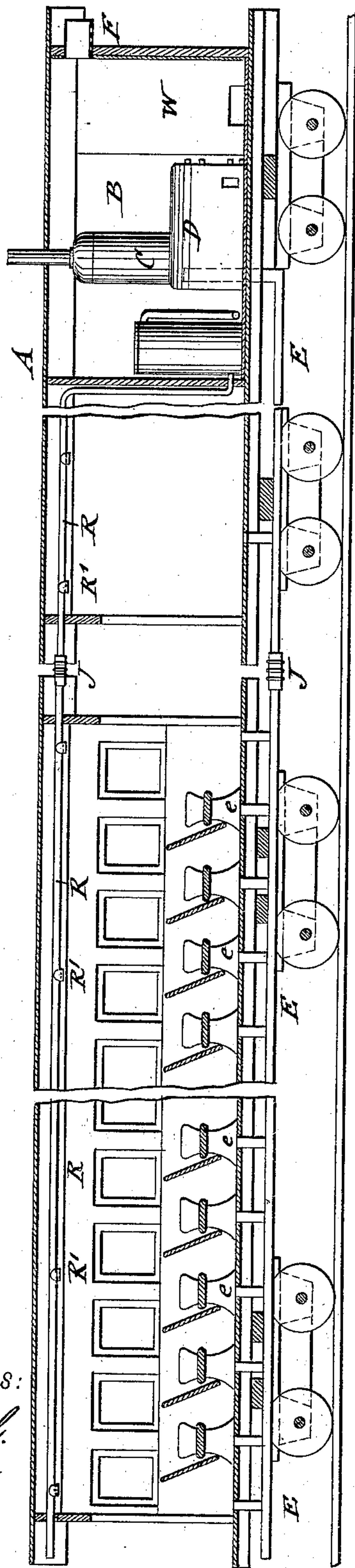
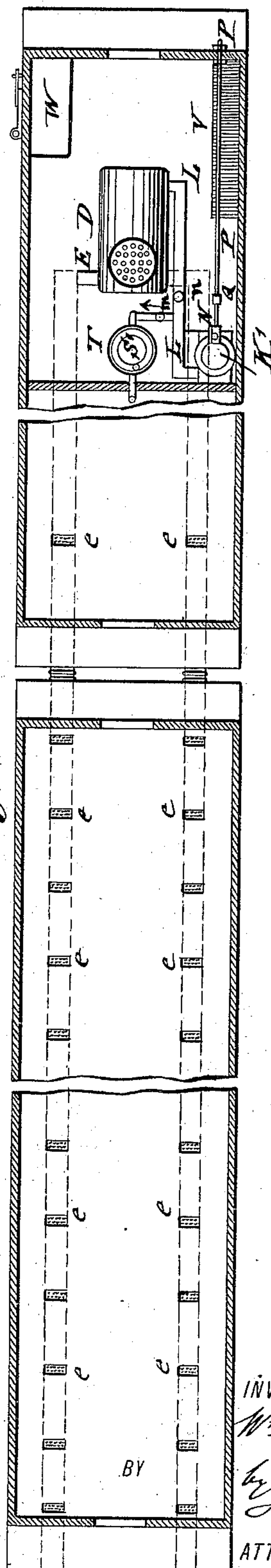


Fig. 2.



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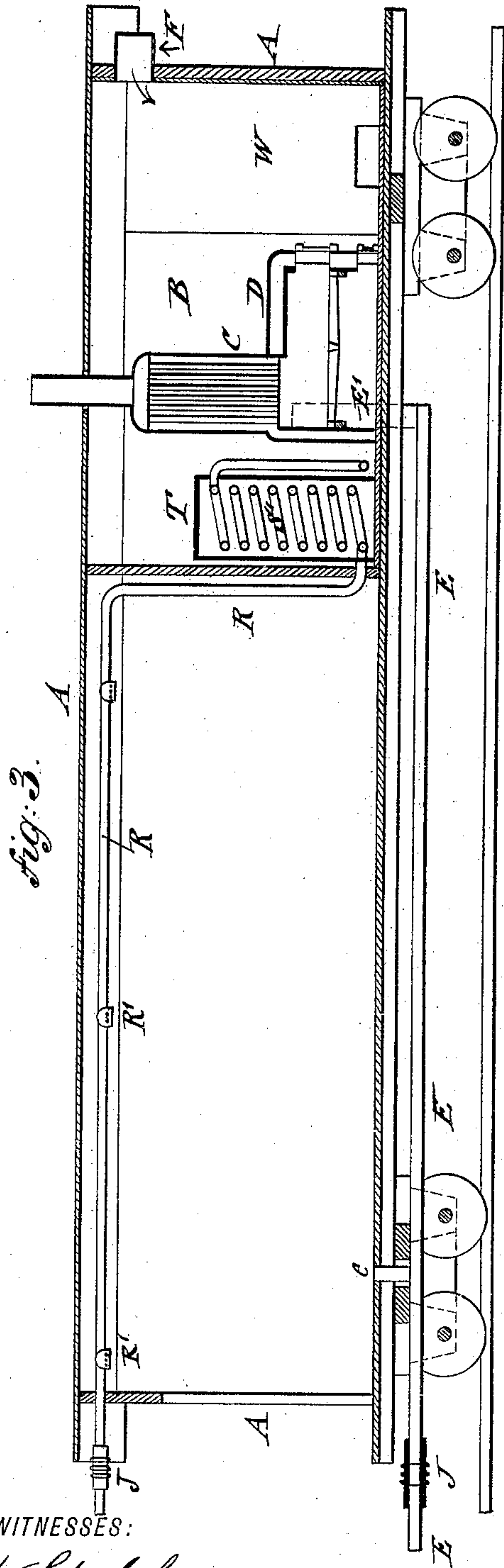
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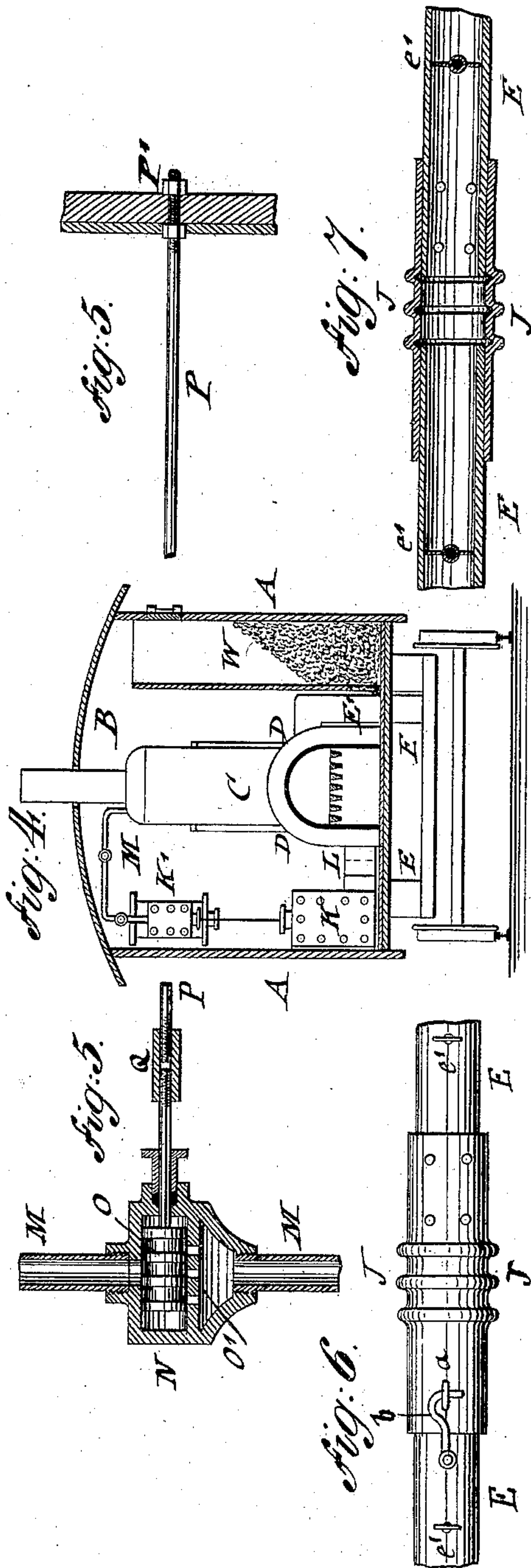
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# UNITED STATES PATENT OFFICE.

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TO P. P. DICKINSON, OF NEW YORK, N. Y.

## APPARATUS FOR HEATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 383,247, dated May 22, 1888.

Application filed May 4, 1887. Serial No. 237,027. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. PLUMB, of Lake City, Hinsdale county, State of Colorado, have invented certain new and useful Improvements in Apparatus for Heating Railway-Cars, of which the following is a specification.

This invention relates to a new and improved system for heating railway-cars, which works effectively whether the train is in motion or at a standstill at a depot or station, and in which the quantity of air supplied is automatically regulated, while it can be used in summer or in countries having a warm climate for supplying fresh air of lower temperature to the cars of a train.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a baggage and passenger car equipped with my improved heating system, parts being broken out. Fig. 2 is a sectional plan view of the same, parts being broken out. Fig. 3 is a longitudinal sectional elevation of the baggage-car, showing the heater and air-cooler in section and the pipes for conducting the heating or cooling medium. Fig. 4 is a cross sectional view of the same. Fig. 5 is a longitudinal sectional view of the device for regulating the speed of the air-pump, part being broken away; and Figs. 6 and 7 are respectively a side view and longitudinal section of the flexible coupling for uniting the air-conducting pipes between the cars.

Similar letters of reference indicate corresponding parts.

At the front end of the baggage car A a compartment, B, is provided, which is lined with asbestos, sheet metal, or made fire-proof in any other suitable manner. In this compartment B is arranged a steam-boiler, C, which is surrounded by a jacket, that forms with the surface of the boiler an air-heating furnace, D. The compartment B is provided at its upper part with a screened air-box, F, through which fresh air is admitted to the compartment B.

In the compartment B an air-pump, K, is located, which is operated by a steam-engine, K', that receives its steam from the boiler C. Said air-pump compresses the air, which is drawn into the compartment B through the air-box F, and forces the said air through a flue, L, connecting the pump with the air-heater D

into the latter, so as to be heated by contact with the hot surfaces of the boiler and jacket. From the heater D the hot air is passed through pipes E, suspended from the bottom of the cars, and connected by vertical pipes E' with the heater to openings *ee* in the bottoms of the cars. The pump thus draws in the cold air, transmits the same to the heater, and forces it into the cars, thus keeping up a continuous circulation of hot air in the cars.

The longitudinal supply-pipes E E below the cars are connected by flexible couplings J between the cars. Each pipe E is provided at each end with a damper or gate, *e'*, for closing the pipe and preventing the escape of air from the same, when it forms the end of the system of supply-pipes. The bottom openings, *ee*, may be provided with registers in the bottom of the car-floors, as shown in Fig. 2. The flexible couplings J, previously mentioned, consist of sleeves made of asbestos or suitable fire-proof material, the middle part of said sleeves being corrugated, so as to expand with the motions of the cars around curves, &c. The couplings or sleeves are permanently attached at one end to the heating-pipe E of one car and slipped over the end of the pipe E of the next car, to which pipe it is attached by eyes *a*, projecting from the sides of the pipes, and hooks *b*, pivoted to the sides of the pipes, whereby the couplings are securely retained on the pipes E, as shown in Fig. 6.

In the pipe M, which conducts the steam from the boiler to the steam-engine K', is interposed a cylindrical valve-box, N, in which a valve, O, with a series of annular channels, is arranged to slide on a valve-face, O', having ports. In certain positions the ribs in the valve O, close the ports more than at others, and thus permit less steam to pass, and at other times the apertures are more open, thus permitting of more steam passing to the engine. The stem of the valve O is connected by a threaded sleeve, Q, with a copper rod, P, the opposite end P' of which is permanently attached to the wall of the compartment B, as shown in Figs. 2 and 5. By the expansion and contraction of said rod the valve O is regulated to admit a larger or smaller quantity of steam to the engine, so that the same is worked more or less rapidly, whereby the speed of the engine and pump is in-



creased or decreased and a greater or smaller quantity of air forced through the air-heater and pipes to the cars. The screw-sleeve Q serves to adjust the valve to any desired position. The copper rod P is so adjusted that the valve is shifted automatically, according to the temperature of the outside air, so that a larger quantity of air is pumped through the heater in cold weather and a smaller quantity in warm weather. All these devices are used when the cars are to be heated; but in summer my improved system is adapted to supply the cars with fresh and cold air. For this purpose the air-pipes R are arranged along the ceiling or roof of the cars and provided with the perforated distributors R'. The ends of the pipes R are connected by flexible couplings in the same manner as the pipes E. The pipes R are connected with a coil, S', located in a tank, T, for receiving ice, ice-water, or other cooling medium, the other end of said coil being connected with the flue L and air-pump K, as shown in Fig. 2. The flue L has a valve, n, and the pipe leading to the coil S' a valve, m, so as to connect the air-pump K either with a cooling-pipe, S', or with the air-heater D.

W represents a coal-bin, and V a water-tank for supplying the boiler with water.

Having thus described my invention, I claim as new and desire to secure by Letters Patent— 30

The combination of a car having a compartment provided with an opening to the outside air, a device for changing the temperature of the air admitted to said compartment, an air-forcing apparatus for forcing said air through said device, an air-pipe connecting said device with the air-forcing apparatus, a distributing-pipe leading from said temperature-changing device, a steam-engine for driving said apparatus, a steam-boiler, a steam-pipe connecting the steam-boiler with the cylinder of the engine, a valve-box in said pipe provided with a valve-face having a series of ports, a channeled valve in said box, an expansible rod exposed to the air admitted to said compartment and connected at one end to the wall thereof, and an adjustable coupling connecting the other end of said rod to the stem of said valve, substantially as described. 45

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 50

WILLIAM H. PLUMB.

Witnesses:

JAMES GALLOWAY,  
J. M. MURPHY.