

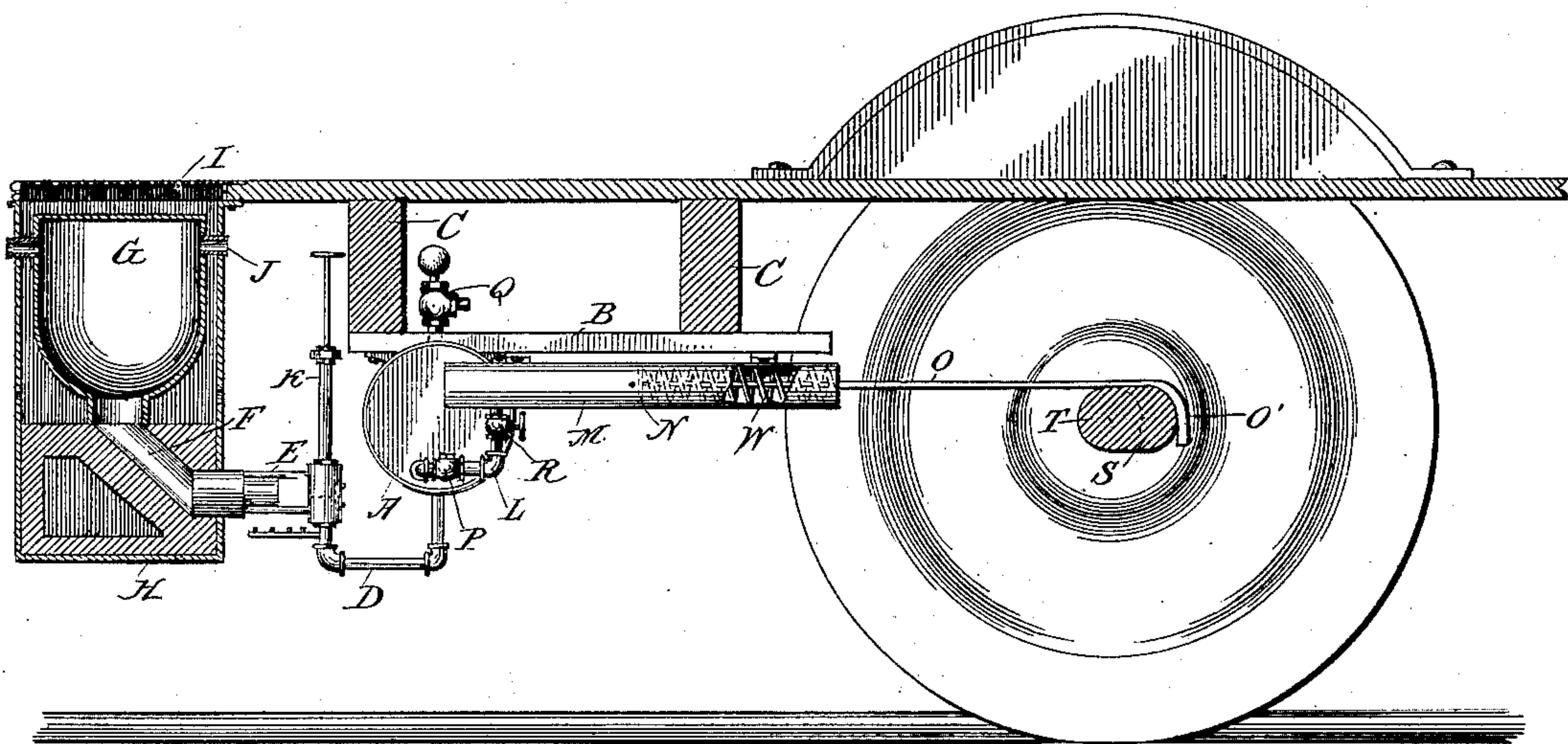
(No Model.)

W. C. DUNN.

CAR HEATER.

No. 359,206.

Patented Mar. 8, 1887.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

WARD C. DUNN, OF CHICAGO, ILLINOIS.

## CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 359,206, dated March 8, 1887.

Application filed February 18, 1886. Serial No. 192,392. (No model.)

*To all whom it may concern:*

Be it known that I, WARD C. DUNN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Heaters, which I desire to protect by Letters Patent of the United States, and of which the following is a specification.

In the use of both vaporizing and non-vaporizing oil-stoves it is necessary, in order to obtain good results, to provide some sort of a positive feed for the oil, and this is especially necessary in vaporizing-stoves where the fuel is projected into the retort from a point without it. Various forms of motive force have been proposed to effect the requisite pressure upon the oil—such as compressed air, springs, and steam introduced into the fuel-pipe near its exit. Compressed air has been found a useful and practical motor; but in using it it has been necessary to contend with the difficulty of frequently replenishing the air in order to maintain the requisite pressure as the oil is consumed, and this has been attended with such inconvenience that the use of compressed air for this purpose has been small. On the other hand, a spring which shall be of sufficient strength and range of movement to serve the purpose without exceeding in its action the limits of its elasticity must be of such length and size when applied to a reservoir of a car-heater as to occupy an inconvenient amount of space, and be altogether unwieldy as well as expensive, while if the spring is made shorter and forced in its action beyond its limit of elasticity it will soon wear out; and steam as a motor has been found to work badly because of the deposits and clogging it causes in the pipe, necessitating frequent overhauling.

I propose to make, and my invention consists in making, an air-pump a part of the permanent apparatus, and so locating and arranging it that it may be operated automatically by connection with moving parts of the car. The requisite pressure can thus at all times be maintained with the utmost convenience, and compressed air, which has been found the most efficient motor for the purpose, retained. I also propose, in order to prevent an excess of

pressure in the reservoir, to provide a safety-valve.

In the drawing annexed, which forms a part of this specification, the figure shows a side view, partly in section, of my apparatus as applied to a car, the pump in this figure being represented as automatically operated.

A is the oil-reservoir, bolted to a board, B, attached to the floor-beams C of a street-car. From the reservoir a pipe, D, leads to the vaporizing-burner E, placed at the entrance of a combustion-chamber, F G, fixed within the box H, attached to the floor of the car, the upper part of this box constituting an air-chamber about the combustion-chamber, into which air enters near the bottom through holes in the walls thereof, and rises, when heated by radiation from the combustion-chamber, through a register, I, into the car, vents J from the combustion-chamber being provided, which pass through the walls of the air-chamber and carry out the products of combustion. The usual valve, K, is provided for regulating the escape of fuel. This portion of my construction is the same as that shown in a previous application made by me October 23, 1885, Serial No. 180,741, patented on the 8th day of June, 1886, No. 343,445, and is not claimed in detail herein, my invention consisting in the combination, with a car-heater of this or other appropriate description, of the feed apparatus which will now be described.

From the end of the reservoir A opposite to that from which the feed-pipe D proceeds, a pipe, L, connects with a tube, M, also attached to the board B. In this tube, which is hermetically closed at the end next to the reservoir, is a piston, N, provided with a piston-rod, O, the tube M being provided with a vent, as shown, near its center, and the pipe L having the usual air-pump valve, P. This apparatus constitutes an air-pump, which operates when the piston is forced forward and back past the vent. The hand-valve R controls the flow of air through the pipe into the reservoir. A safety-valve, Q, of any usual construction and made to keep the air-pressure within proper limits, connects with the air-pump end of the reservoir.

By "safety-valve" I mean any and every



provision in the construction of the reservoir, or cylinder tube and piston for the escape of air when the pressure would otherwise run too high.

5 The outward motion of the piston is effected by the operation of a cam, S, upon the axle T of the car-wheel while engaging with a curved arm, O', upon the outer end of the piston-rod, while the inward motion of the piston is ef-  
10 fected by a spring, W, held between the piston and the head of the cylinder M.

The length of stroke of the piston in the apparatus shown in the figure, and its size, and the setting of valve R should be so adjusted  
15 that as the car moves something near the normal amount of air-pressure will be maintained, any excess being thrown off through the safety-valve.

I am aware that it has been proposed to use  
20 the rotating motion of the axle of a car for forcing air through pipes to assist in ventilation, and I am also aware that air-pumps have heretofore been used to create a pressure to force liquid fuel to a burner. I claim neither  
25 of these constructions broadly, the gist of my invention lying in so forming the air-reservoir of an oil-heater carried by a car and so connecting the same with apparatus operated by a moving part of the car that a steady press-

ure may be maintained in the fuel-reservoir, 30 notwithstanding the constant drain upon it through the consumption of fuel, and that at the same time the degree of pressure shall be held within safe and proper limits.

I claim—

1. The combination of a car, an oil-burning heater, a fuel-reservoir connected therewith, an air-pump communicating with said reservoir, operating connections between the piston of said pump and the axle of the car, 40 whereby the pump is driven by the rotation of the axle, and a safety-valve in the reservoir for preventing an excess of pressure upon the fuel, substantially as and for the purpose set forth.

2. The combination of a car, an oil-burning heater, a fuel-reservoir connected therewith, an air-pump communicating with said reservoir, the piston of said pump having a curved arm on its outer end, a cam formed on the car- 50 axle and engaging with said curved arm for moving the piston in one direction, and a spring for moving the piston in the opposite direction, substantially as described and shown.

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