

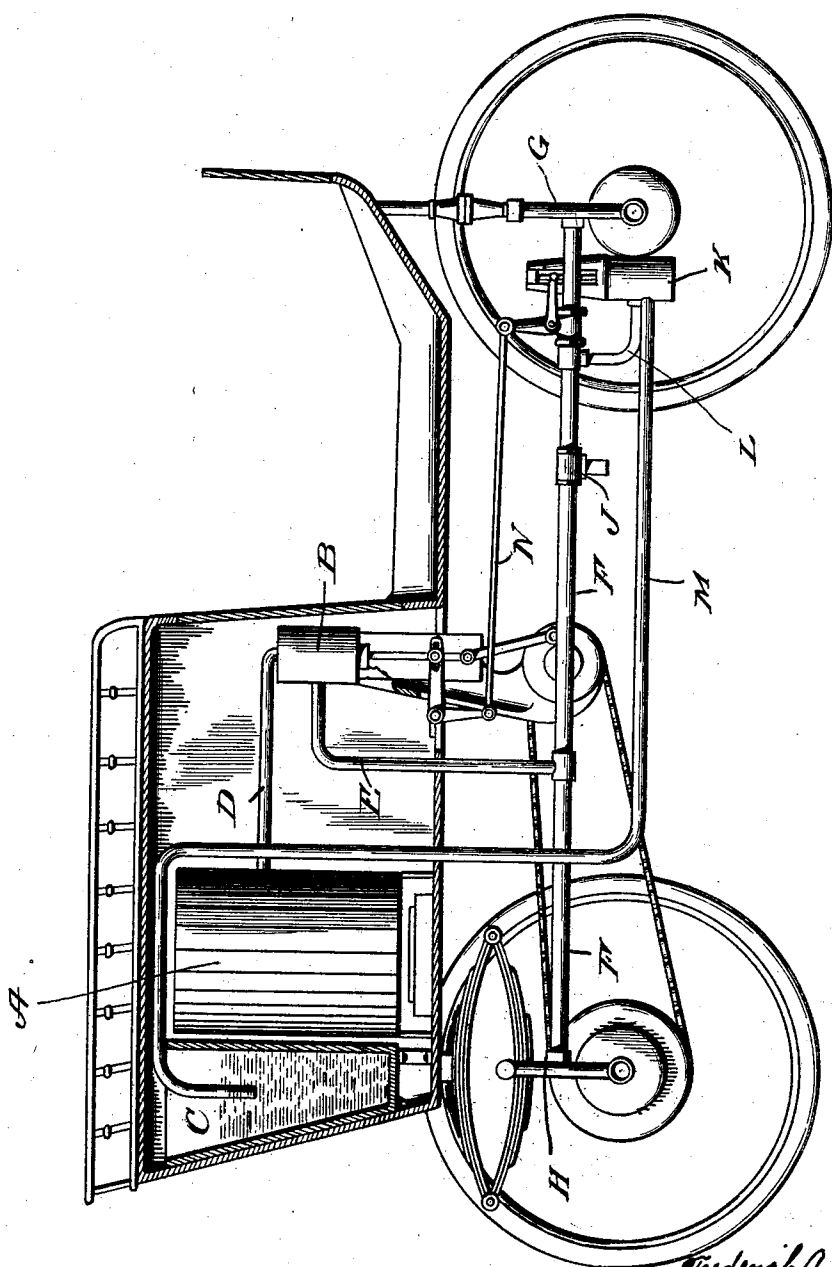
No. 696,121.

F. A. WALDRON.
MOTOR VEHICLE.

Patented Mar. 25, 1902.

(Application filed Mar. 8, 1901.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

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MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 696,121, dated March 25, 1902.

Application filed March 8, 1901. Serial No. 50,361. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. WALDRON, a citizen of the United States, residing at Stamford, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Motor-Vehicles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the following invention I am aware that the existing forms of steam-propelled vehicles are lacking in the finer details regarding steam economy. I am also familiar with the well-known constructions and designs of these vehicles, and in the invention herein described I have endeavored to eliminate some of the principal faults.

It is well known that the common failing of steam-propelled vehicles, commonly known as the "mobile" or "locomobile" type, is in the boiler capacity and its fuel-carrying capacity. This is due mainly to the lack of economy in the design and operation of its engine. The evils resulting from the above are known to all users of this type of vehicle and seriously impair the life of the boiler, causing frequent repairs and the use of a large amount of fuel, which not only reduces the efficiency of the mechanism, but also limits the quantity of fuel and water carried. The condensing apparatus of the form usually applied to steam-engines are very objectionable, owing to the increased weight and the lack of water for condensing purposes. The trail of vapor left by these carriages, as well as other carriages of different types, is also objectionable in the extreme.

In the following invention described it is my purpose to overcome the above objections on the following well-known thermodynamic law—i. e., that an engine exhausting into a vacuum uses from thirty-three and one-third to fifty per cent. less water or steam than an engine exhausting directly into the atmosphere. It is obvious, therefore, that if a condenser can be so arranged on this carriage without adding any perceptible weight to the carriage the advantage would be threefold. In order to accomplish this, I have devised the following combination as described in this specification.

The drawing shows in section the outline of the ordinary type of steam-propelled vehicle, of which A is the boiler; B, the engine; C, the feed-water tank; F F, G, and H, the tubular framework common to vehicles of this type.

My invention consists in the leading of the exhaust-steam in pipe E from the engine B into the vacuum formed in frame F F, G, and H by the air-pump K for the purpose of condensing the exhaust-steam from the engine by the exposure of a large frame-surface to the air, the motion of the vehicle, together with its exposed surface, serving as a cooling and condensing medium in proportion to the amount of steam used.

D is the inlet-pipe from the boiler to the engine.

J is an automatic relief-valve, which works only when by accident the vacuum in the frame is destroyed.

K is an air-pump connected with the engine by means of a rod N, which transmits motion from the engine B to the air-pump K.

M is the discharge-pipe from the air-pump delivering the condensed steam into the feed-water tank C.

The operation of this combination is as follows: Steam is generated in the boiler A. From there it passes through the inlet-pipe D into the engine B. After doing its work in the engine it passes into the exhaust-pipe E, and from there circulates through the frame F F, G, and H, where the cooling-surface of the frame condenses it. From the frame it passes in the form of water through the pipe L to the air-pump K and thence through the pipe M to the feed-water tank C.

I do not confine myself to the detail of this condensing apparatus nor to the direction or form in which the pipe E shall connect into the frame F F, G, and H. I sometimes use the pipe E in the form of a cooling-chamber, either exposed to the air or placed in the tank C, surrounded by the feed-water, and from either of these places it may then be led to the frames F F, G, and H. In this way I am able to effect an increase in the life of the boilers, a reduction of cost of operation, and an increased steaming radius without any appreciable addition to weight or complication of existing methods. Further, I obviate the

train of vapor left behind vehicles of this class. Neither do I confine myself to the type of engine used. It may be either single-acting or compound or triple-expansion.

- 5 The safety-valve is tight only so long as a vacuum exists in the frame. In the event of the vacuum being destroyed by failure of the steam to condense or the air-pump to work the atmospheric pressure is overbalanced
10 and the valve opens, allowing the steam to escape to the open air without injuring the pump or stopping the carriage.

What I claim is—

1. In a steam-actuated vehicle, the combination with a hollow closed air-tight framework constituting the running-gear of the vehicle, of means for creating a vacuum in said framework and means whereby the exhaust-steam from the engine passes into said
20 vacuum.

2. In a steam-actuated vehicle, the combination with a hollow closed air-tight framework constituting the running-gear of the vehicle, and an air-pump connected therewith
25 to create a vacuum in said framework, of means whereby the exhaust-steam from the engine passes into said vacuum, and a relief-valve connected to said framework between

the exhaust-passage of the engine and the inlet-passage of the air-pump.

3. In a steam-actuated vehicle the combination with the hollow framework, a passage or pipe connecting the exhaust-passage of the engine with the framework of an air-pump connected with the framework to create a
35 vacuum therein, a relief-valve connected to said frame between the exhaust-passage of the engine and inlet-passage of the air-pump, a feed-water tank and a delivery-pipe connection between said pump and the feed-water
40 tank.

4. In a steam-actuated vehicle the combination with the hollow framework and engine and feed-water tank, of an exhaust-pipe leading from the engine into the hollow frame-
45 work, an air-pump connected with the engine, an automatic relief-valve in said frame between the exhaust of the engine and said pump, a pipe connecting the frame with said pump, and a discharge-pipe leading from the
50 pump into the feed-water tank.

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