

L. RANSOM.
STEAM STREET-CAR.

No. 187,314.

Patented Feb. 13, 1877.

Fig. 1.

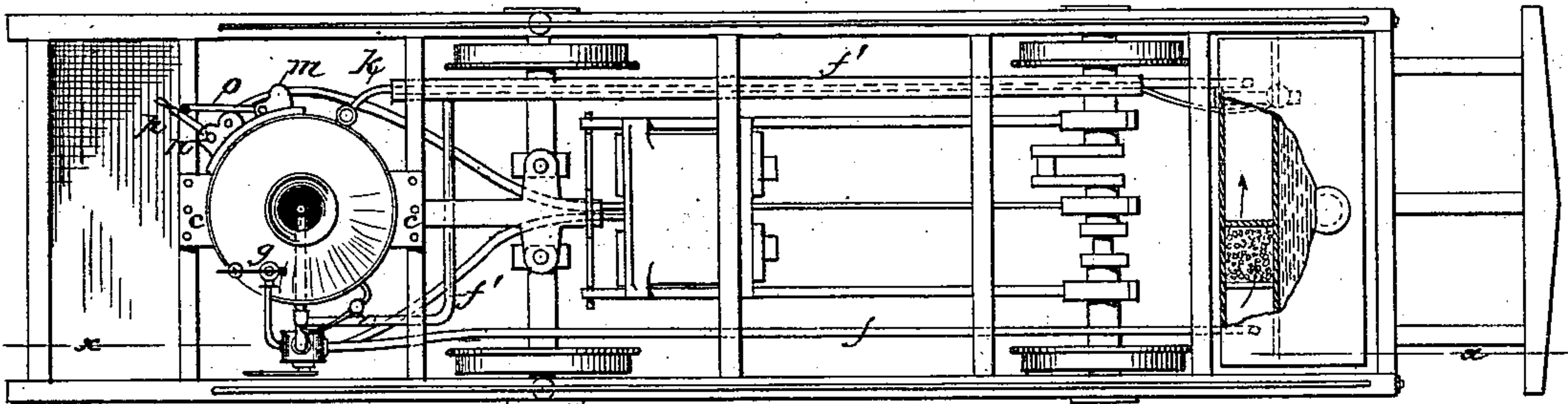


Fig. 2.

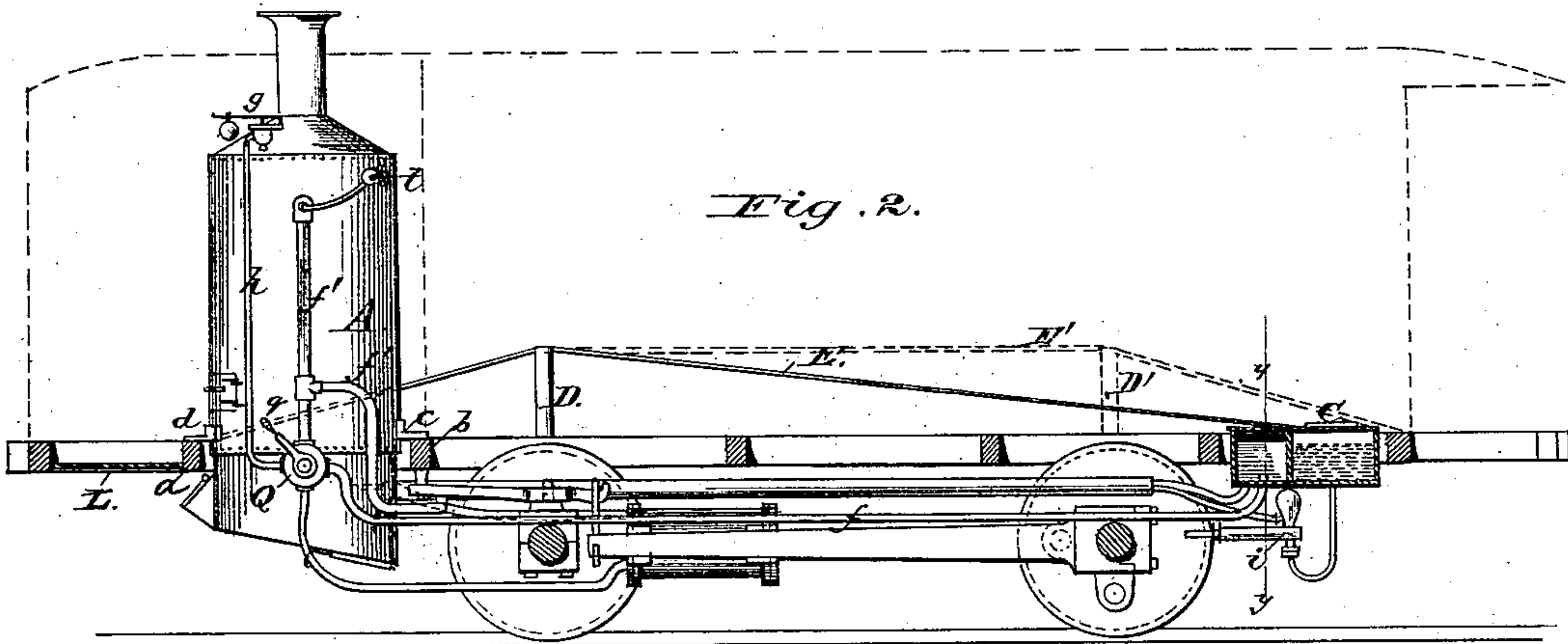


Fig. 3.

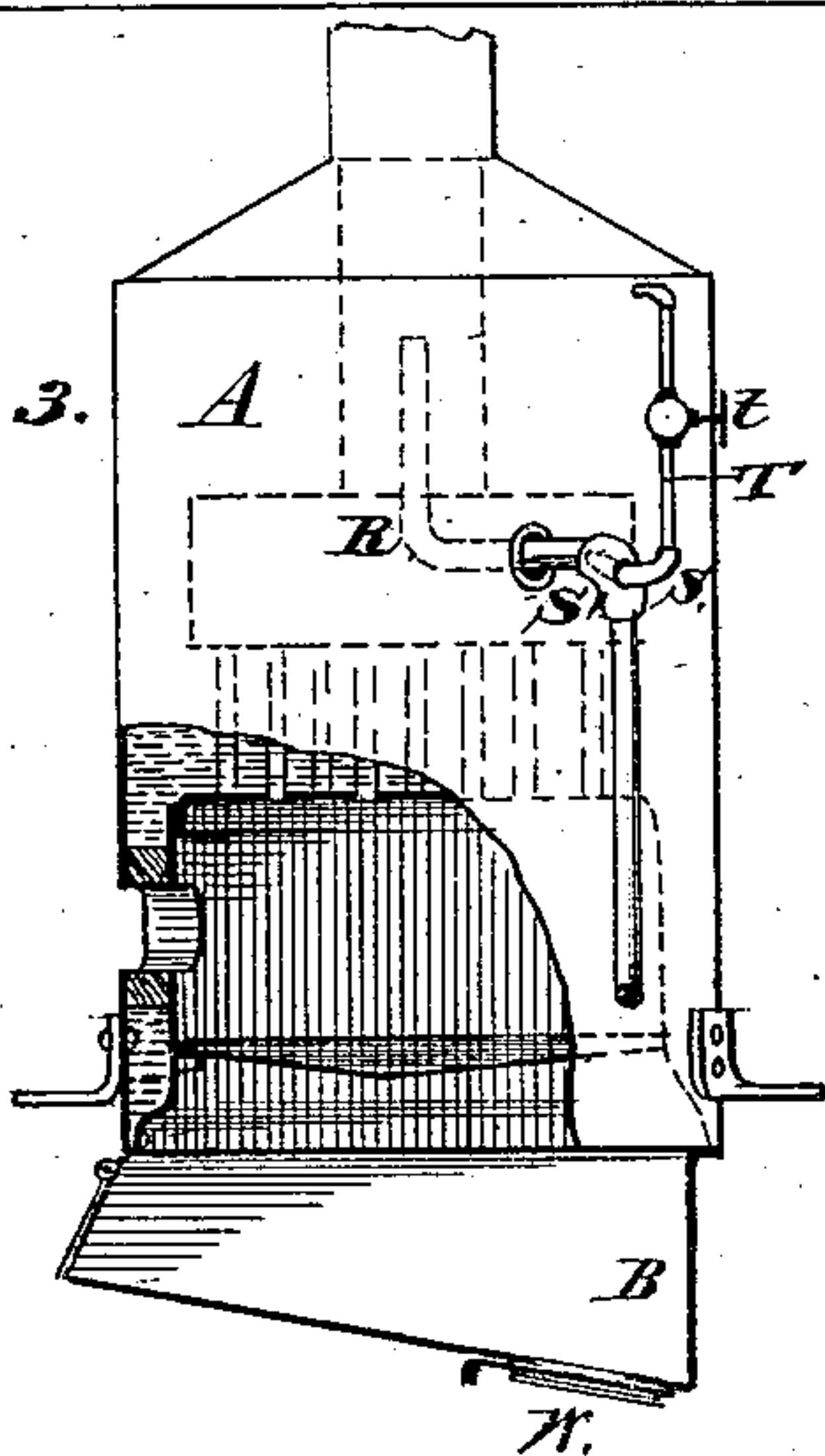
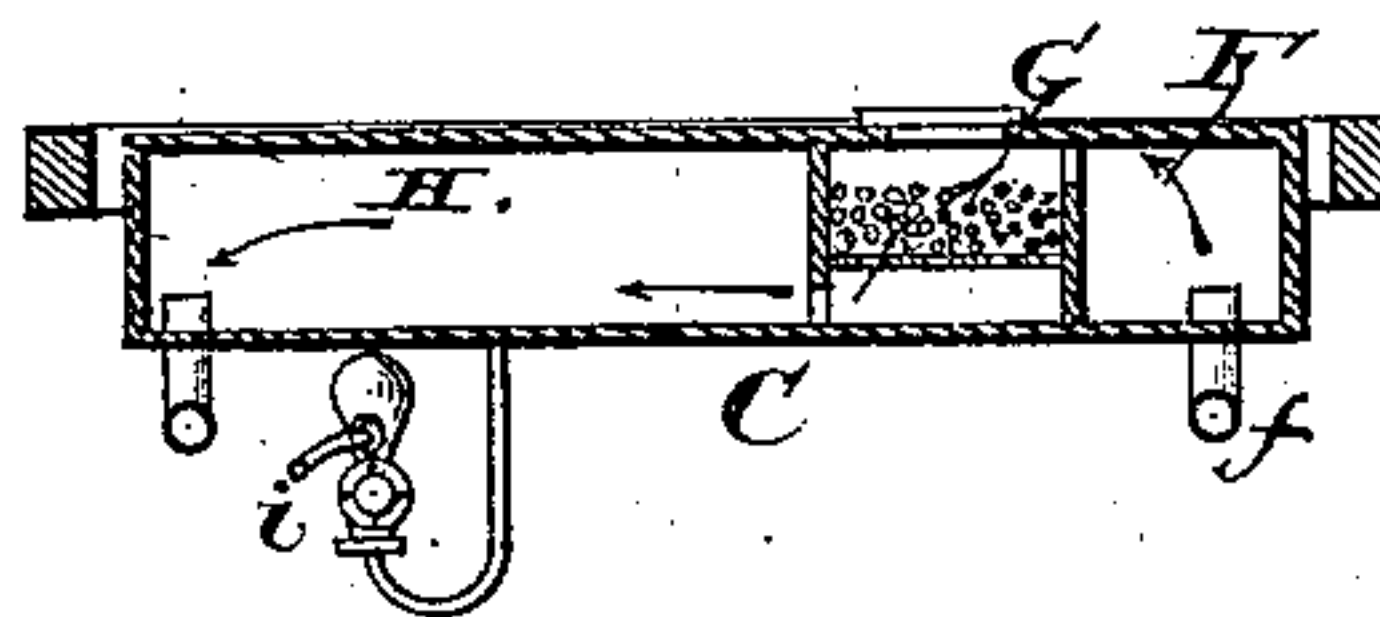


Fig. 4.



Attest:
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UNITED STATES PATENT OFFICE.

LOUIS RANSOM, OF STRATFORD, NEW YORK.

IMPROVEMENT IN STEAM STREET-CARS.

Specification forming part of Letters Patent No. **187,314**, dated February 13, 1877; application filed December 1, 1876.

To all whom it may concern :

Be it known that I, LOUIS RANSOM, of Stratford, county of Fulton and State of New York, have invented certain new and useful Improvements in Steam Street-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Figure 1 is a plan view of my improved steam-car; Fig. 2, a longitudinal section through the car, showing the several steam and other connections in elevation; Fig. 3, a partial section and elevation of the boiler; and Fig. 4, a sectional view, showing the muffler and its connections, together with an elevation of the pump.

Like letters in all the figures refer to corresponding parts.

My improvements relate to that class of street-cars intended to be propelled by steam; and the invention consists in certain novel arrangement and combination of parts necessary to obviate numerous objections heretofore urged against the use of this class of cars, all of which will be hereinafter described, and then pointed out in the claims.

The boiler A is located forward of the front wheels, being sustained upon the transoms *a b* of the car-frame by suitable lugs *c d*, the ash-pan B projecting below said frame, and the water-tank C is placed in rear of the rear wheels between the car-timbers at that point. The frames of nearly all street-cars and railway-coaches are strengthened by trusses, but as the weight is about equally distributed through these classes of cars, the trusses are designed to carry an equal burden. In the common street-car this is accomplished by erecting a standard or post over each wheel and passing the truss-rod over their tops and attaching its ends to the opposite ends of the car. Now, if such a truss were employed in this steam-car, having a heavy boiler in front and a light water-tank behind, the forward end would lop down while the back end would be cocked up by the unequal weights carried at the opposite end of the car. To correct this difficulty a truss is used having a single standard erected over the wheel nearest to the greater weight. This arrange-

ment, by lifting more directly upon the greater weight and more obliquely on the less, leaves the car-frame straight under unequal strain.

In order to avoid the objections common to all steam street-cars on account of the noise made by the escaping steam, I have contrived a muffler through which the exhaust-steam may be compelled to pass, and which is constructed substantially as follows: The exhaust-pipe *f* communicates with a chamber, F, from the top of which the steam passes down through a body of pebbles placed in the box G through the perforated opening at bottom, and thence into the chamber H, which is considerably larger than the chamber F. From the chamber H the steam is conveyed forward through a pipe inclosing the feed-water pipe, and thence to the exhaust-nozzle in the boiler. The pebbles in the box G serve to divide up the single current of escaping steam into numerous minute streams, and cause it to issue from the smoke-stack in a current without noise. These pebbles may be replaced by bits of iron, wood, or any material which will afford a multitude of minute channels. The muffler is placed in the water-tank, by reason of which the waste heat of the exhaust steam is utilized to partially heat the feed-water, and connection with the exhaust-nozzle in the boiler is made for the purpose of assisting the draft of the furnace. The steady and uniform current of steam consequent upon the use of the muffler is found to be very effective in keeping the fire in good condition. It is quite as necessary to subdue the noise of steam escaping from the safety-valve as from the engine, and for this purpose the steam from the safety-valve *g* is conducted through the pipe *h* into the engine's exhaust-pipe *f*, and takes the course of the exhaust steam through the muffler and back to the smoke-stack. The tank being placed in the after part of the car, it is obvious that water would be liable to back away from the pump when the car is ascending a grade, were such pump placed in the forward end of the car or near the boiler.

Under the arrangements shown, water in the tank is nearly always warmed and often heated by steam passing through the muffler; and it is well known that hot water is pumped with difficulty when suction is required to fill the

pump, and it is desirable to heat the feed-water as much as possible before it enters the boiler. Under these circumstances I deem it most advantageous to locate the feed-pump *i* beneath the tank *C*, where the water will flow into it by its own gravity, and where no inclination of the car can lift it above the water-level in the tank. The water in the tank is warmed by steam passing through the muffler, but that it may be still further heated before entering the boiler, the exhaust-steam pipe is carried across the car and joined to a much larger pipe, *f'*, running near the side and under the floor of the car and enveloping the feed-pipe *k*, which is thus exposed to heat of the steam escaping from the engine or through the safety-valve. This arrangement not only heats the water very much, but avoids danger of freezing in the winter. The water is heated most after leaving the pump, which may be of any desired pattern and operated by eccentrics in the usual way.

I am aware that feed-pumps have before been located beneath the water-tanks, and also that the feed-water has been heated by waste steam after leaving the pump. But I am not aware that either of these features have been applied to street-cars, or that they have been combined under any circumstances on locomotive-engines previous to my invention.

At *Q* is a two-way valve, the lever *q* of which is within easy reach of the engineer. By means of this valve the exhaust steam may be directed through the muffler or out through the smoke-stack as desired, and the steam from the safety-valve may be similarly directed.

The engine is intended to be thoroughly incased to protect it from dust and dirt, and its cylinder end is suspended by a bar or lever which is journaled upon the front axle, all of which is fully described in separate applications for patents.

The muffler-box, filled with pebbles or the like, and receiving steam at top, may be used in any situation other than the one illustrated. It will be observed that back pressure upon the exhaust steam is intended to be avoided as much as possible by enlarging its conduits after it passes through the muffler; and further, for all practical purposes, steam may be let into the pebble-box by any convenient arrangement of pipes.

With the accessories above described, the

steam-car is easily operated and controlled, noise from the escaping steam is subdued, and the weight being properly distributed, the car runs smoothly and without the usual liability to leave the track.

Upon the method of bracing the car-frame, the boiler, the blower, and the combined brake and throttle valves, as herein illustrated, I propose to make separate applications for patents.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam-car, wherein the boiler is placed at one end and the water-tank at the other, the feed-water pipe located below the floor of said car, and combined with the enlarged exhaust-pipe which envelops it, to form a feed-water heater and to prevent freezing, as set forth.

2. In a steam-car in which the boiler is located at one end and the water-tank at the other, the combination, with said tank, of a feed-pump placed thereunder, and adapted to operate in the manner described.

3. In a steam-car in which the boiler is located at one end and the water-tank at the other, the two-way valve *Q*, in combination with the exhaust and blower pipes, whereby steam from either engine or safety-valve may be directed to the muffler or to the blower, substantially as shown and described.

4. In a street-car carrying a boiler at one end and a water-tank at the other, the combination, with the exhaust-pipe, of a box provided with grated bottom and containing pebbles (or equivalent material) adapted to receive and discharge steam, substantially as and for the purposes set forth.

5. The combination, with a muffler-box provided with a grated bottom and containing a mass of pebbles (or equivalent material) and a pipe leading thereto directly from the safety-valve, of a steam-boiler, said box being located adjacent to the water-tank, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

LOUIS RANSOM.

Witnesses:

GEORGE H. COLE,
JOHN HIGGINS.