2 Sheets—Sheet 1.

L. RANSOM.

ENGINES FOR PROPELLING STREET-CARS.

No. 183,970. Patented Oct. 31, 1876.

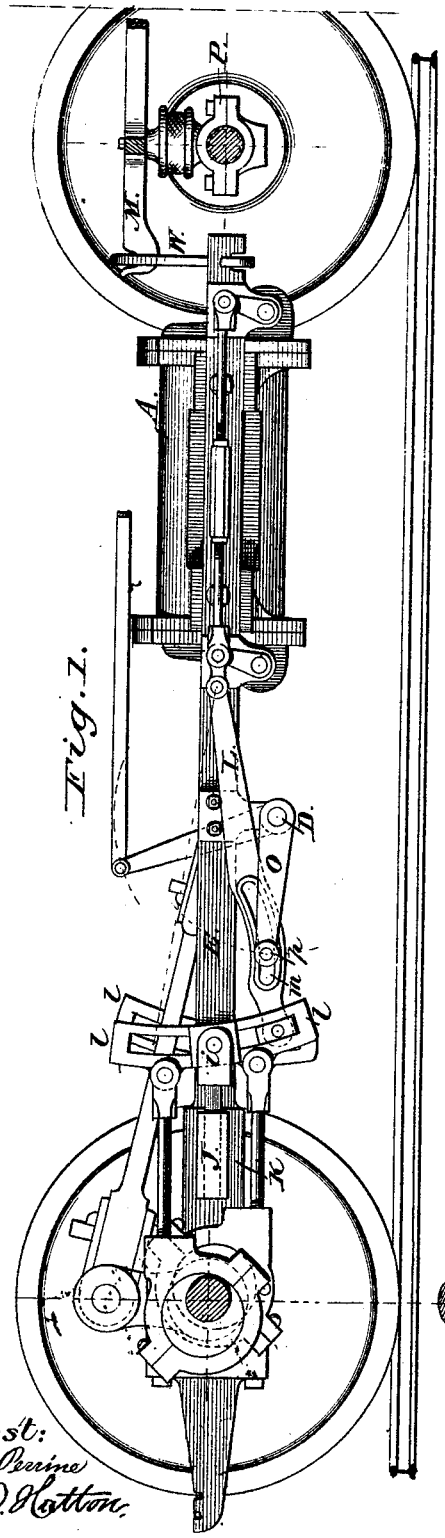

Fig. 1.

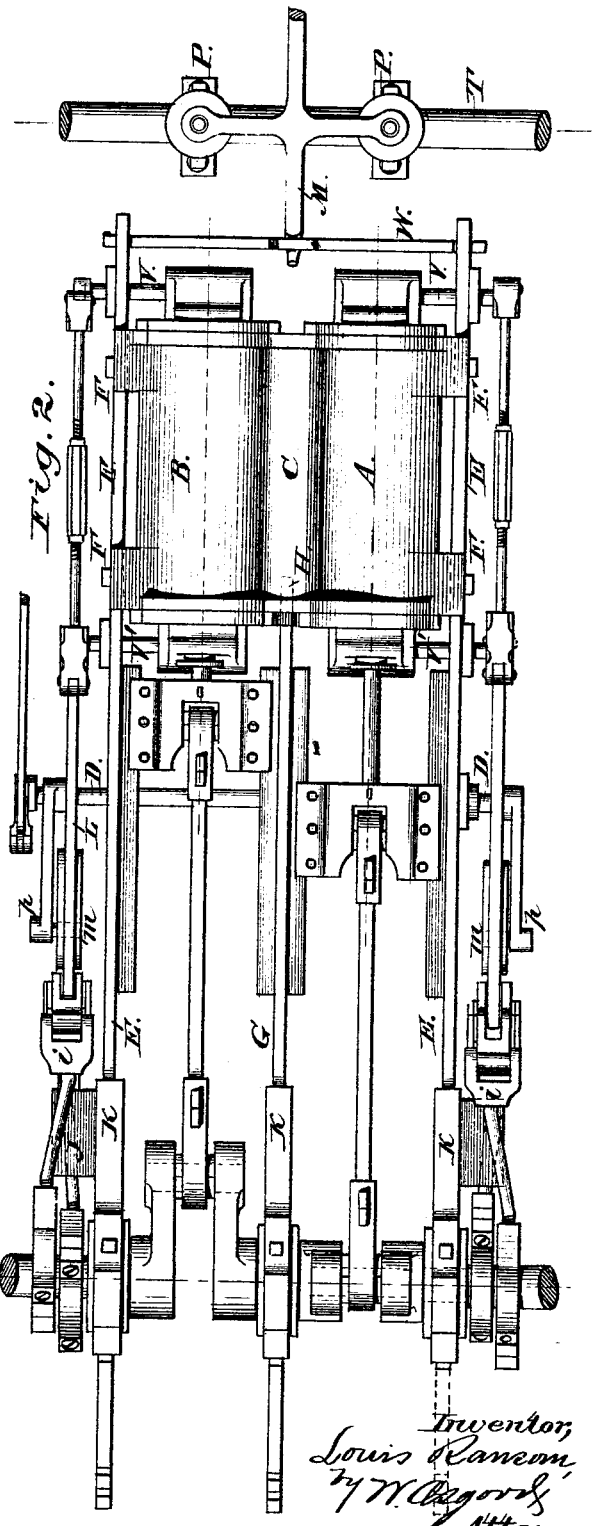

Fig. 2.

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H. L. Perine
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2 Sheets—Sheet 2.

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Fig. 3.

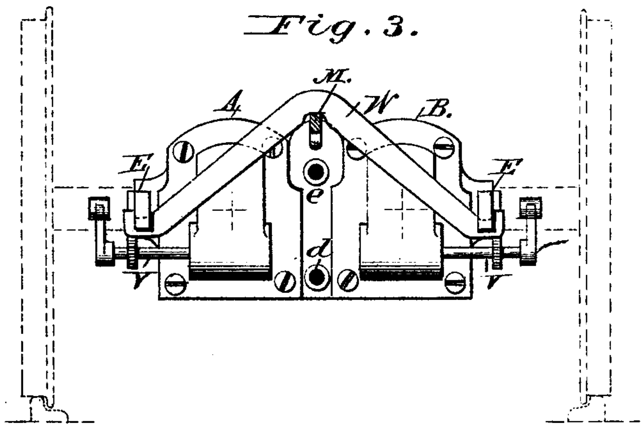
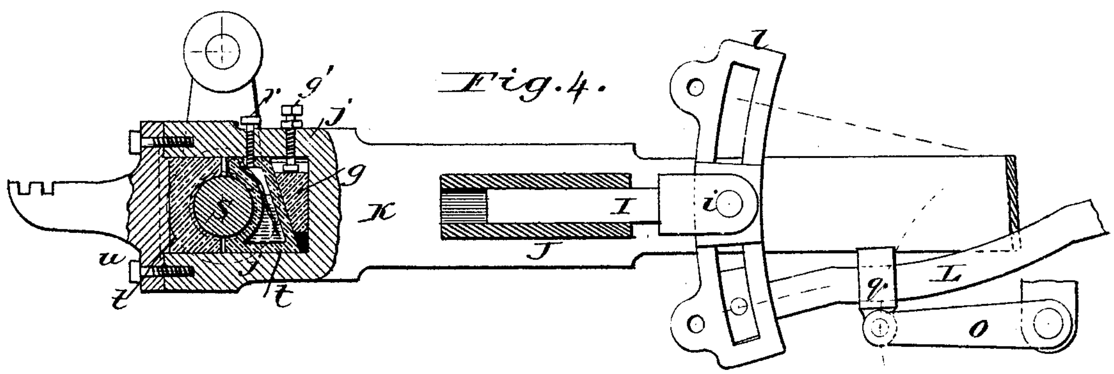


Fig. 4.



Attest:
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UNITED STATES PATENT OFFICE.

LOUIS RANSOM, OF STRATFORD, NEW YORK.

IMPROVEMENT IN ENGINES FOR PROPELLING STREET-CARS.

Specification forming part of Letters Patent No. **183,970**, dated October 31, 1876; application filed September 20, 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-Engines, 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 side view of my improved engine; Fig. 2, a plan of same; Fig. 3, an end elevation of the front of the cylinders, showing the bail which sustains this part of the engine. Fig. 4 is a partial section and elevation, showing strap-joint and oiler as applied to one of the frame-bars, and a modified form of the connection between the radius-bar and its operating-crank.

Like letters in all the figures refer to corresponding parts.

The object of my invention is to produce an engine which shall be compact and simple in its several parts and especially adapted for use in the propulsion of street-cars, to accomplish which it (the invention) consists in certain peculiarities of construction and arrangements of parts, to be hereinafter more fully described, and then pointed out in the claims.

An engine of this class, which is designed to be placed beneath the body of the car, should be so constructed that the machinery can be thoroughly protected from dust, which would otherwise cut out the wearing parts. To protect it, I propose to employ a dust-casing, for which I intend to make an application for patent in future. This dust-casing will require that the engine be quite compact in structure.

The two cylinders A and B are cast in a single piece, and are united by webs, which form steam-chambers nearly or quite surrounding the cylinders. The valves V V V′ V′ are placed in the cylinder-heads and at the bottom thereof. I prefer to employ the oscillating valve, and to locate its axis perpendicularly to the plane of the axis of the cylinder, for convenience in removing. This arrangement enables me to avoid the high and clumsy steam-chests upon the top or sides of the cylinders; to make the steam-ports as short and economical as possible; to provide for the escape of water from the cylinders or from the boiler through them, without danger to the heads; and to provide for the easy and quick redressing of the valve-seats.

It is intended that the engine shall be placed between the two axles when the car has four wheels, and between the rear axle and the forward truck when it has six, the rear wheels being the drivers in each instance. I propose to employ a stationary link, *l*, which is supported by trunnions at the center *i*. These trunnions are fitted into the forked bar I, which works easily in the guide J. The bar I supports the link firmly in place, while it easily receives the motion arising from the angular advance of the eccentrics, and gives less slip to the link-block than is imparted by the common sustaining-link, and occupies no space beyond what would be required for the engine without it.

The frame of the engine is made in the following manner: Two metallic bars, E E, are let flush into the cylinder-lugs F F, and are bolted and locked in place. A third bar, G, is secured in any suitable manner to the middle space H, between the cylinders. Each of these bars is provided with a head-block, K, preferably of malleable iron, firmly riveted thereto, and opening into the jaws *j j*, which receive and hold the boxes *t* in which the shaft S revolves. These boxes are locked in by the keeper *u*, which is secured to the jaws by any convenient form of bolts or studs. The shaft S, which is the axle of the driving-wheels, is thus compelled to support the weight of one end of the engine. The cylinder or front end of the engine is suspended by means of a bail, *w*, which hooks into notches in the side bars E E, extending beyond the cylinders for this purpose. This bail is supported at its center by the lever M, whose fulcrum is upon the front axle T, upon which suitably-arranged boxes P P are placed, so that said axle may revolve without disturbing the lever. The opposite end of the lever M may be placed beneath the transom which supports the boiler, and there securely held. A simple bar, fixed in sockets between two cross-timbers of the car-floor, may take the place of the lever. With the lever, the entire weight of the engine rests on the car-axles; with the bar, the

the cylinder end hangs on the car-frame. By either arrangement the front of the engine hangs on a single point, so that no torsion of the car from derailment or other causes can affect it injuriously.

By thus suspending the engine, its cylinder end hangs loosely. It may swing or revolve around the axle and be in perfect line at every point. The driving-axle sustains all the working strain, and is, therefore, practically the only foundation of the engine, which is a material feature of my invention. The valves may be set with the greatest accuracy and with certainty that no motion of the car or engine can disturb their action.

When necessary to inspect or repair the engine, by unhooking the bail and disconnecting the steam-pipes the front of the engine may be dropped and will hang pendent from the crank-axle; or, by jacking up the rear end of the car, the engine and driving-wheels may be run out readily and left completely exposed for work.

The several points of novelty herein specified are peculiarly advantageous in an engine intended for street-cars and the like; but I do not wish to be limited to such uses, as its compact, simple, and cheap form recommends the engine for any use.

I propose to make application for patents for improvements shown in the cylinders, the valves, the link-motion, and the oiler, which are not herein claimed.

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

1. An engine-frame connected with the crank-axle, substantially as explained, so that the whole engine may be revolved about said axle, and have no other foundation save the axle, for the purposes set forth.

2. The combination, with the side frames E E, of the bail *w* and the lever or bar M sustaining the same at a single point, for the purposes set forth.

3. The combination, with the car-axle T, of the lever or bar M, journaled upon said axle and supporting the cylinder end of the engine, substantially as set forth.

4. In combination with the cylinders A B, which are supported at one end by the bail W, the side bars E E and center bars G, secured to said cylinders and boxed upon the crank-axle, substantially as and for the purpose described.

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

LOUIS RANSOM.

Witnesses:
GEO. H. COLE,
JOHN HIGGINS.