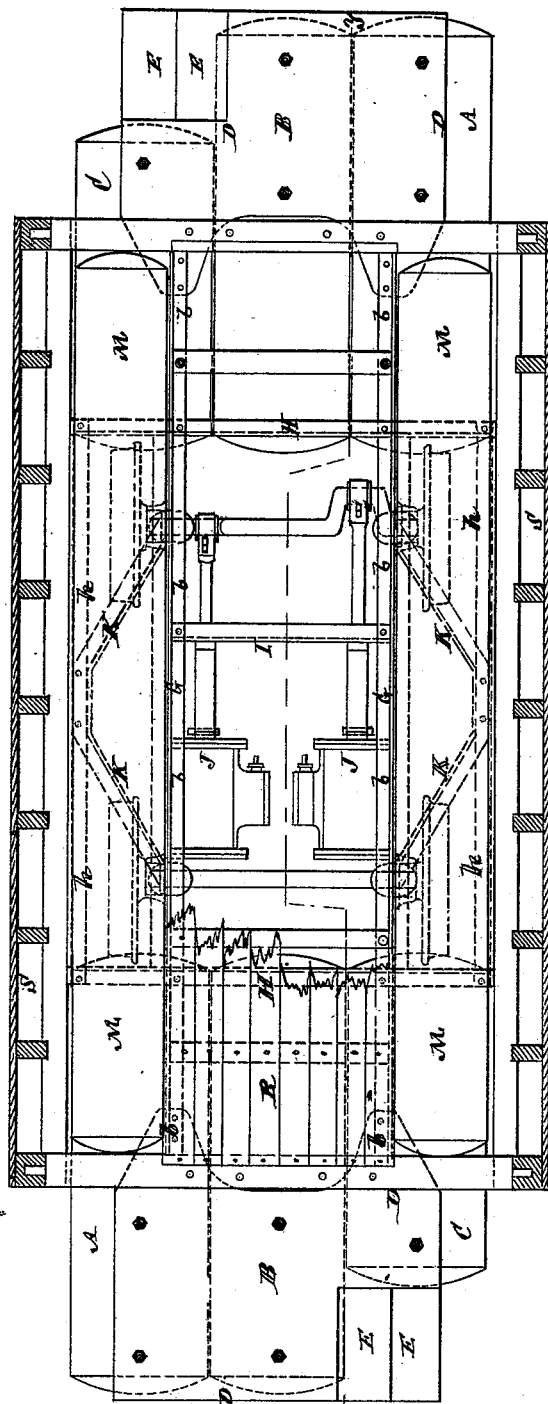


R. HARDIE & J. JAMES.
Street-Car.

2 Sheets—Sheet 1.

No. 215,198.

Patented May 6, 1879.



Witnesses
John Beecher
Fred. Raynes
Fig. 1.

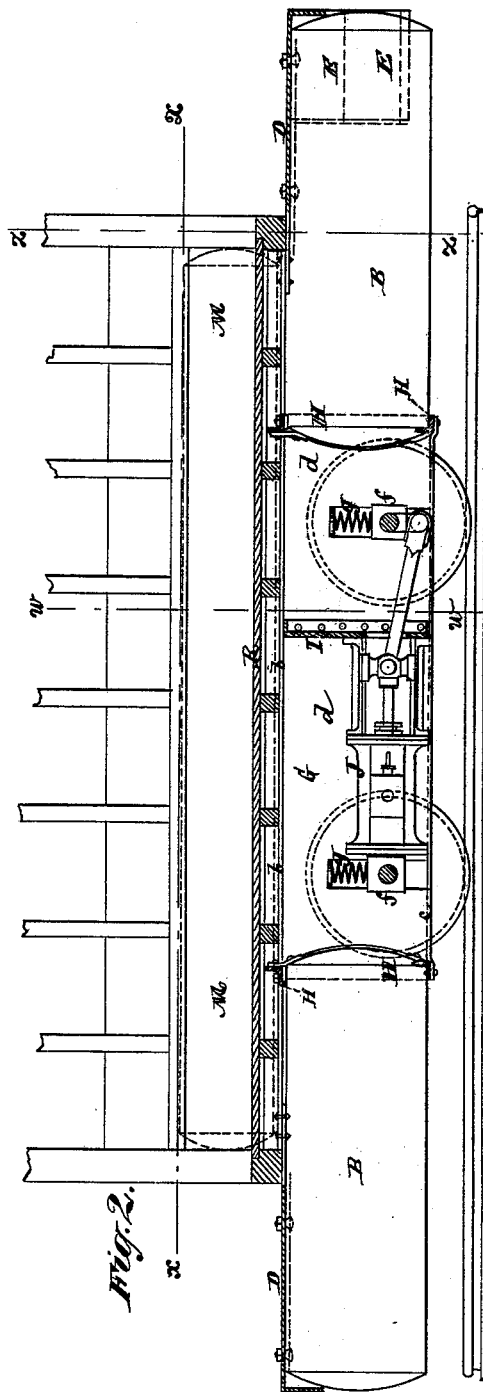


Fig. 2.
Inventors
Robert Hardie
John James
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R. HARDIE & J. JAMES.

2 Sheets—Sheet 2.

Street-Car.

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Fig. 5.

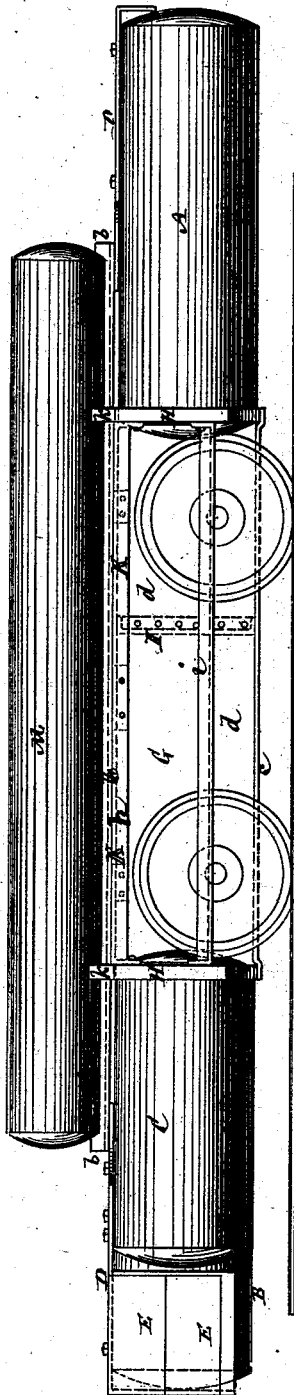


Fig. 3.

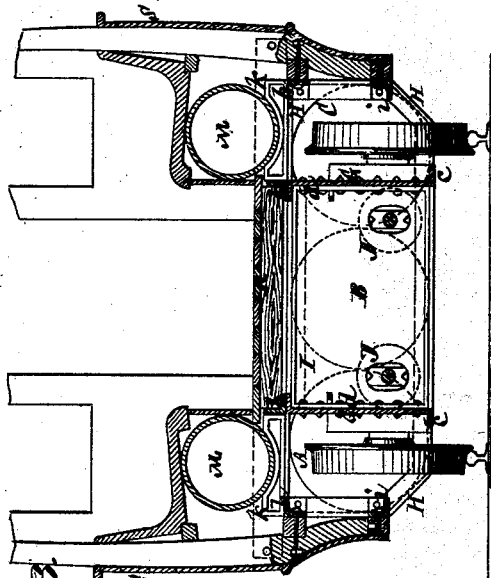
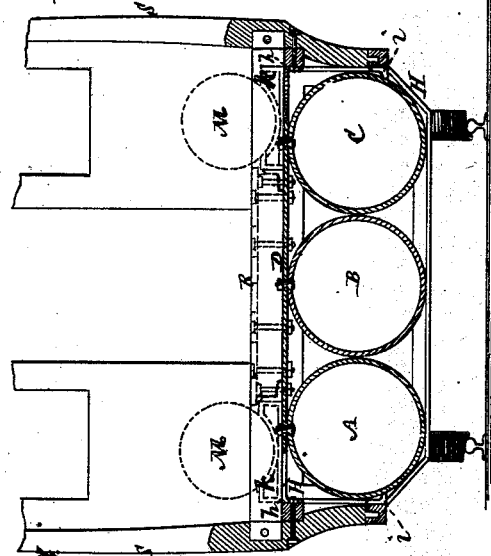


Fig. 4.



Witnesses

John Becker
Fred Wayne

Inventors

Robert Hardie
John James
by their Attorneys
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UNITED STATES PATENT OFFICE.

ROBERT HARDIE AND JOHN JAMES, OF NEW YORK, N. Y., ASSIGNORS TO
THE PNEUMATIC TRAMWAY ENGINE COMPANY, OF SAME PLACE.

IMPROVEMENT IN STREET-CARS.

Specification forming part of Letters Patent No. **215,198**, dated May 6, 1879; application filed
October 3, 1878.

To all whom it may concern:

Be it known that we, ROBERT HARDIE and JOHN JAMES, both of the city and State of New York, have invented certain new and useful Improvements in Cars Propelled by Air or Gas under Pressure, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention more particularly relates to compressed-air cars for street-railroads; and consists in certain combinations of reservoirs with a metallic framing of novel construction, whereby great strength is combined with lightness, and the same framing which supports the reservoirs also supports the engines by which the car is propelled.

In the accompanying drawings, Figure 1 represents a horizontal section on the line *x x* in Fig. 2 of a compressed-air car, showing the larger portion of the flooring removed and having our invention applied. Fig. 2 is a vertical longitudinal section of the same on the irregular line *y y* in Fig. 1. Fig. 3 is a transverse vertical section on the line *w w* in Fig. 2, and Fig. 4 is a further transverse vertical section on the line *z z*. Fig. 5 is a side elevation, mainly of a lower metallic framing and reservoirs, with the wood-work of the car removed.

A, B, and C are compressed-air reservoirs, arranged side by side at opposite ends of the car and beneath the floor R of the body S thereof. These reservoirs extend beyond the ends of the car-body and beneath the opposite end platforms, D, of the car, but are of such restricted dimensions in their length as to leave a sufficient space between both end series for the engine or engines and driving mechanism of the car. Said reservoirs are of cylindrical construction, and one of them, C, on opposite sides of the car, at opposite ends thereof, is shorter than the rest to provide for the arrangement of the side steps, E, to the platform.

When steps are required on both sides of the opposite ends of the car, then the reservoirs A are similarly shortened.

G G are opposite side girders, forming part of a lower metallic framing, and arranged be-

tween the opposite end reservoirs, A C A C. These girders are composed of upper and lower angular or L-shaped members, *b c*, and a connecting web-plate, *d*, and connect with and are secured to opposite end frames, H, at the inner heads of each series of reservoirs A B C, and also by an extension of the upper members, *b*, to the opposite end platforms or platform-bases, D, of the car.

The several reservoirs A B C are riveted, bolted, or otherwise secured to the end frames, H, and platform-bases D, formed of metallic plates, whereby the girders G not only serve to unite both series of opposite end reservoirs, A B C, but to support them and keep them from sagging at their outer ends, and said reservoirs form parts of a supporting-base for the floor of the car, and the girders G other parts thereof. Said girders are tied together intermediately of their length by a plate-brace, I, which combines with the girders and end frames, H, to constitute a lower metallic framing, that not only supports the reservoirs A B C, but also forms the framing for the engine J of the car, the cylinders of which are secured to the side girders. The axle-boxes *f* of the car and springs *g* controlling the same are or may be also carried by the girders.

Outside of the girders G and parallel with them are upper and lower longitudinal ties or braces, *h i*, arranged to connect the opposite end heads or frames, H, and between the longitudinal braces *h* and the girders G are secured diagonal braces K K, which serve to stiffen the girders laterally. These longitudinal and diagonal braces also form part of the lower metallic framing, of which the girders are a prominent element. Said lower metallic framing combines lightness with great strength, and not only serves to carry the reservoirs and to support them against deflection and from lateral disturbance, but also forms a firm base for the car-body, as well as being the framing of the engine. Such framing likewise serves, by means of saddles *k* on the end frames, H, to support or carry additional upper compressed-air reservoirs, M M, arranged to extend throughout the length of the car beneath its seats. These reservoirs and the several

lower reservoirs should all be connected by suitable pipes to collectively supply the engines with the motive agent.

I claim—

The combination, with the reservoirs at opposite ends of the car, of the frames H, secured to the ends of the reservoirs, the opposite side girders, G G, consisting of the upper and lower angular members, *b c*, and connecting web-plate *d*, said girders being attached to the opposite end frames, H, the braces *h i*, arranged outside of and longitudinally to the girders, and connecting the frames H and the diagonal

braces K K, secured between the braces *h* and the girders G, and serving to stiffen the girders laterally, all substantially as shown, and for the purposes described.

ROBT. HARDIE.
JOHN JAMES.

Witnesses to the signature of Robert Hardie:

T. J. KEANE,
HENRY T. BROWN.

Witnesses to the signature of John James:

HENRY T. BROWN,
T. J. KEANE.