

R. STEEL & S. AUSTIN.
HAND-MOTOR FOR STREET-CARS.

No. 170,969.

Patented Dec. 14, 1875.

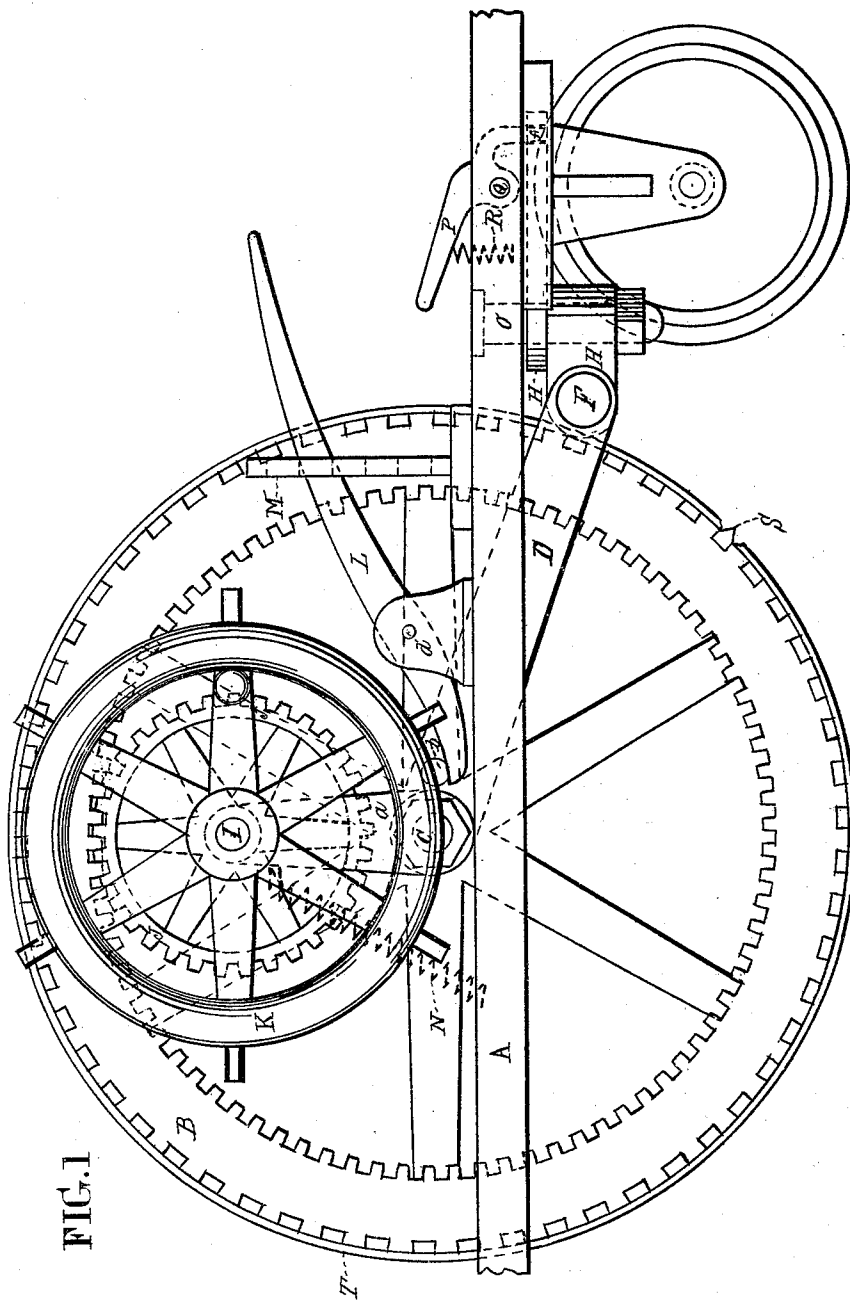


FIG. 1

Witnesses

Thomas J. Dawley

George C. Hebel

Inventors.

Robert Steel

Samuel Austin

Stephen Votick Attorney

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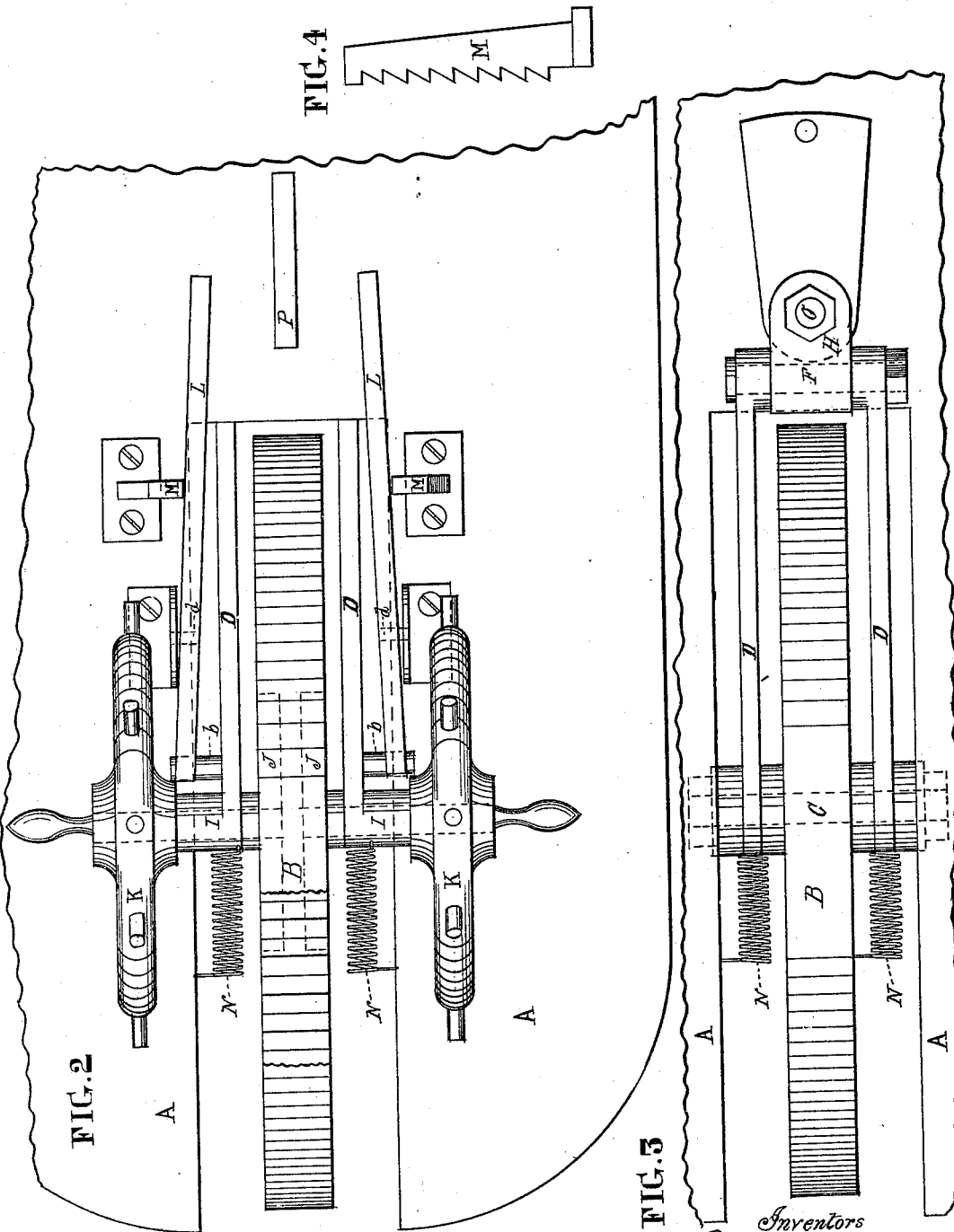


FIG. 2

FIG. 3

Witnesses

Thomas J. Dewley.

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Robert Steel

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UNITED STATES PATENT OFFICE.

ROBERT STEEL AND SAMUEL AUSTIN, OF PHILADELPHIA, PA., ASSIGNORS
OF ONE-THIRD THEIR RIGHT TO CHARLES J. MILLER, OF SAME PLACE.

IMPROVEMENT IN HAND-MOTORS FOR STREET-CARS.

Specification forming part of Letters Patent No. **170,969**, dated December 14, 1875; application filed November 5, 1875.

To all whom it may concern:

Be it known that we, ROBERT STEEL and SAMUEL AUSTIN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Hand-Motors for Street-Cars, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

Our invention mainly consists of a traction-wheel in combination with a swinging frame at the front end of a car. The frame is arranged to oscillate laterally for giving the wheel an oblique direction in turning curves, in addition to a vertical oscillation for the purpose of freeing the wheel from the road-bed when the car is on a descending grade, so that its traction shall not impede the descent of the car, and the weight of the wheel and parts in connection may be brought to bear in accelerating the movement of the car. The pressure of the wheel upon the road-bed is increased by means of tension-springs combined with the bottom of the car and the swinging frame.

The invention further consists in rough-shoeing the traction-wheel by means of steel bars, which are confined in dovetail slots in its periphery.

In the accompanying drawings, Figure 1 is a side elevation of our improved motor connected with the front end of a car. Fig. 2, Sheet No. 2, is a plan view of the same. Fig. 3 is a bottom view. Fig. 4 is a face view of one of the racks M.

Like letters of reference in all the figures indicate the same parts.

A represents the front end of the bottom of the car, to which our improvements are attached. B is a traction-wheel, which turns on the shaft C of the swinging frame D. The frame, at its rear end, is hung on the horizontal rod F, in the front end of the swivel H, on which the frame is permitted to oscillate vertically for raising or lowering the wheel B, as hereinafter described. The frame has upright arms *a a*, which are provided with the shafts I I, on the inner ends of which are pinions J—one on each side of the wheel B. The rim of the wheel projects outward from the spokes, and is provided with teeth, into which the

teeth of the pinions gear. On the outer ends of the shafts I I are hand-wheels K K, which are turned by men to propel the car. At each side of the wheel there is a lever, L, hung on the pin *d*. The front ends of the levers catch under the pins *b*, which project from the sides of the swinging frame D, and when the car is on a descending grade the free end of one or both of the levers is borne down, so as to elevate the wheel from the road-bed. There are vertical toothed racks M M, into which the levers are engaged to hold the wheel in its elevated position, free from the road-bed, whereby the weight of the wheel and frame assists in giving momentum to the car while running down the grade, thus dispensing with the power of the men, for the purpose of their resting during that period. When it is necessary to again apply the man-power the levers are disengaged from the racks M M, and the wheel B descends upon the road-bed. The pressure of the wheel upon the road-bed is increased by means of the wire springs N N, connected at their lower ends to the bottom A of the car, and at their upper ends to the arms *a a* of the swinging frame D. The swivel H is connected to the bottom of the car by means of the vertical pin O. P is a foot-lever, which is hung on the horizontal rod Q. It has on its lower end a pin, *f*, which enters a corresponding hole in the rear end of the swivel H, to hold the swinging frame D in its parallel position with the car when the latter is passing over a straight track. When the car reaches a curve the lever P is borne down, and its pin thereby disengaged from the swivel H, and the wheel B obliquely inclined toward the center of the curve by pressing or pulling the hand-wheels in that direction, to facilitate the running of the car over the curve. When the car has passed over the curve onto a straight track the traction-wheel is brought into its former parallel position with the car, as shown in the drawings, and the pressure taken off the lever P, allowing it to re-engage with the swivel H to hold the swinging frame securely in position. The spiral spring R, under the free end of the lever, gives certainty to its movement.

The wheel is provided with steel cross-bars S, at equal distances apart, around its pe-

riphery, connected by means of the dovetail grooves *g*, to be used when the road-bed is icy or frozen to prevent the wheel slipping. In other weather the steel bars are dispensed with, and the gum tire *T* is used to prevent the wheel slipping.

We claim as our invention—

1. The combination of traction-wheel *B* and pinions *J J* with the swinging frame *D*, substantially in the manner and for the purpose set forth.

2. The combination of the levers *L L* with the swinging frame *D* and racks *M M*, for raising the wheel *B* above the road-bed and

holding it in its elevated position, substantially as set forth.

3. The combination of the swinging frame *D*, swivel *H*, lever *P*, and spring *R*, whereby to give an oblique position to the traction-wheel *B*, substantially as set forth.

4. The combination of the steel bars *S* with the traction-wheel *B*, to prevent its slipping on icy road-beds, substantially as set forth.

ROBERT STEEL.

SAMUEL AUSTIN.

Witnesses:

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