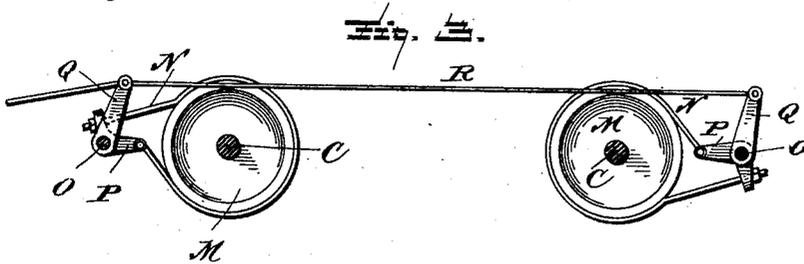
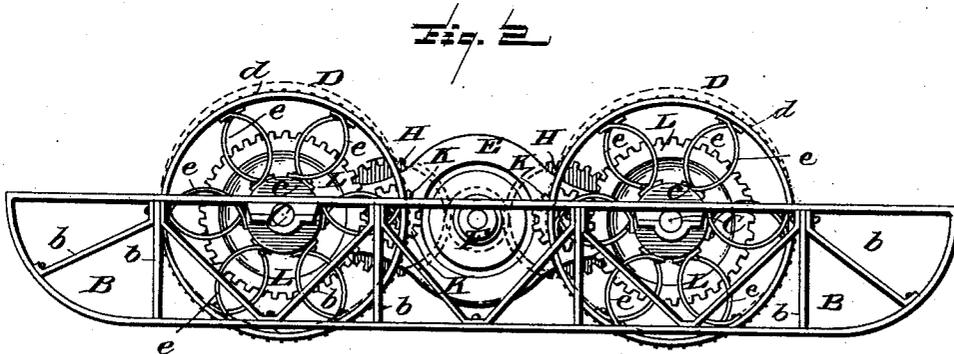
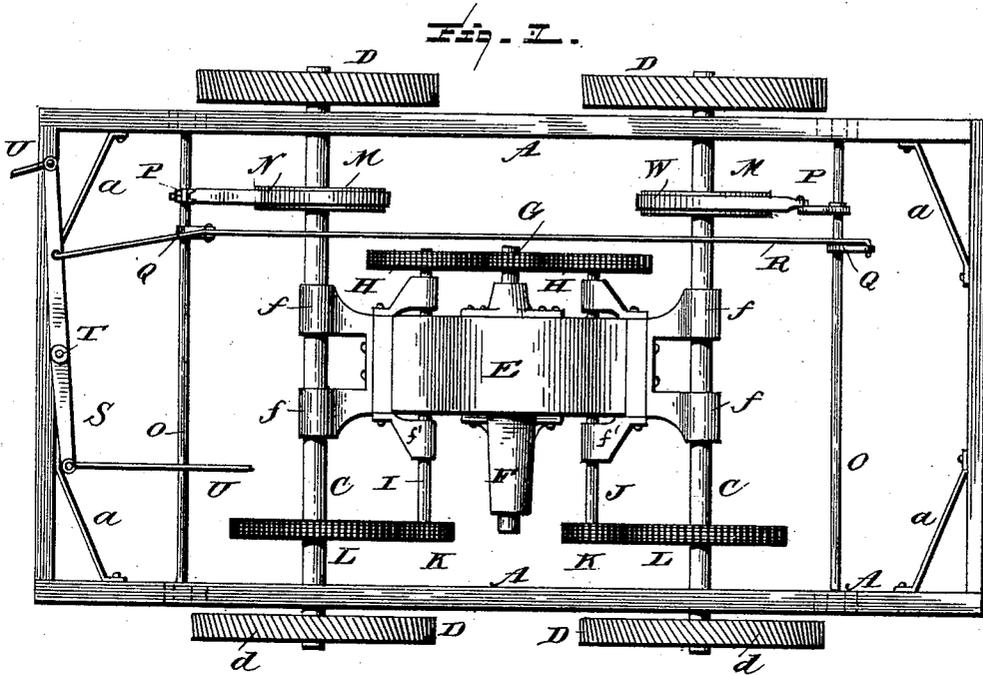


(No Model.)

P. WARDMAN & W. HOLLISTER.
STREET CAR SLEIGH.

No. 437,269.

Patented Sept. 30, 1890.



Witnesses
L. C. Hills.
E. H. Bond

Inventors
Palmer Wardman,
William Hollister
By their Attorneys
Chas. H. Fowler.

UNITED STATES PATENT OFFICE.

PALMER WARDMAN AND WILLIAM HOLLISTER, OF SAULT STE. MARIE,
MICHIGAN.

STREET-CAR SLEIGH.

SPECIFICATION forming part of Letters Patent No. 437,269, dated September 30, 1890.

Application filed February 4, 1890. Serial No. 339,179. (No model.)

To all whom it may concern:

Be it known that we, PALMER WARDMAN and WILLIAM HOLLISTER, citizens of the United States, residing at Sault Ste. Marie, in the county of Chippewa and State of Michigan, have invented certain new and useful Improvements in Electric Street-Car Sleighs; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

This invention relates to certain new and useful improvements in conveyances which shall be known as "street-car sleighs;" and it has for its object, among others, to provide an improved means of conveyance which shall be easy riding and easily propelled, being designed to be propelled by electric energy.

The invention consists in the peculiar combinations and the novel constructions, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the drawings, and then particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a top plan illustrating our invention. Fig. 2 is a side elevation of the same, and Fig. 3 is a side elevation of the brake mechanism.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the frame, composed of suitable longitudinal and cross pieces suitably braced by means of the braces *a*. The runners B are suitably braced by the vertical and angular or inclined braces *b*, as seen best in Fig. 2.

C are the axles in suitable bearings or boxes on the under side of the raves and carrying at their outer ends the traction-wheels D. These wheels may be arranged within the framing of the device, as shown in Fig. 2, or outside the same, as in Fig. 1, but preferably inside, as shown in the former figure. Each of these traction-wheels is constructed as fol-

lows: *c* are hubs on the axles, and *d* are rims, which are connected to the hubs by means of the spring-spokes *e*, which are made of flat spring-steel of sufficient strength to carry the car forward against any ordinary resistance. These spokes are bolted to the hub and to the rim in any suitable manner, and the spokes are arranged in pairs, the two springs of each pair alternately arranged, as shown in Fig. 2. The peripheries of the wheels are provided with suitable projections or other like provisions, as shown in Fig. 2, to prevent them from slipping. The lower peripheries of the wheels extend a slight distance below the runners, as shown in Fig. 2, but through the medium of their flexible spokes are allowed to rise even with the bottoms of the runners.

E is an electric motor of any suitable construction, supported in the framing of the device with its armature-shaft F parallel with the axles of the car and at right angles to the runners, as shown best in Fig. 1. It is supported by bearings *f'*, carried by suitable bearings *f* on the axles, as shown in Fig. 1. The end of this armature-shaft is provided with a pinion G, which meshes with counter-gears H, secured to the counter-shafts I and J, as shown best in Fig. 1, said shafts being mounted in bearings secured to the pole-pieces, the said counter-shafts carrying at their opposite ends pinions K, each of which meshes with a larger pinion L—one on each axle—as seen best in Fig. 1.

Through the medium of the above-described gearing the motion of the armature-shaft is conveyed to both axles of the car, thereby propelling the sleigh in either direction.

On each axle there is secured a friction-wheel M, around each of which passes a band-brake N.

O are shafts secured at their ends in the longitudinal pieces of the framing—one to the rear of the rear axle and one to the front of the front axle, as shown best in Fig. 1. On each of these shafts there is a lever P, to the outer end of one arm of which there is secured one end of the brake-band, the other end being adjustably connected to the end of the other arm of the lever in any suitable manner, as shown in Fig. 3. The levers on

the two shafts are inversely arranged, as shown in said Fig. 3, so that they may be operated simultaneously to apply the brakes.

On the shafts O are the arms Q, which are connected at their outer ends by means of the longitudinal rod or chain R, said rod or chain extending to or connecting with a horizontal lever S, pivoted at T to the front cross-bar of the frame, as shown in Fig. 1, the said connection of the rod with the lever being between its pivot and the end of the lever. Each end of the lever has connected thereto a rod or chain U, one of which extends toward the rear of the car and the other to the front, where they are each connected with suitable means (not shown) by which they may be operated from the platform or other desired place to apply the brakes when necessary.

The pulling upon either rod or chain U tightens both of the straps on their wheels and applies the brakes in a manner which will be readily understood.

What we claim as new is—

1. The combination, with the frame and axles, of the traction-wheels on the axles, with their rims normally extending below the runners and provided with flexible spokes arranged in pairs reversely curved in different planes, substantially as shown and described.

2. The combination, with the frame, the runners, and the axles, of the traction-wheels having their rims normally extending below the runners, the motor supported from the

frame and axles, the armature-shaft of the motor carrying a pinion, pinions on the axles, and gearing between said pinions, substantially as shown and described.

3. The combination, with the frame, traction-wheels, and axles, of the transverse shafts, the levers thereon, the straps connected with the levers and passed around wheels on the axles, the lever pivoted on the forward end of the frame, the arms on the transverse shafts, the rod connecting the said arms and the forward lever, and rods connecting with the ends of said lever and arranged to be actuated, substantially as and for the purpose specified.

4. The combination, with the frame, the axles, and wheels, of the bearings *f* on the axles and extending toward each other, the bearings *f'*, carried by the bearings *f*, the electric motor supported in the bearings *f'*, the counter-shafts I J, supported in the said bearings *f'*, the armature-shaft, and the gearing between the shafts I J and the armature-shaft, substantially as specified.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

PALMER WARDMAN.
WILLIAM HOLLISTER.

Witnesses:

C. W. DUNTON,
JAY W. SUTTON.