

No. 720,291.

PATENTED FEB. 10, 1903.

G. E. SMITH.
RAILWAY CAR.

APPLICATION FILED NOV. 25 1901.

NO MODEL.

FIG. 1-

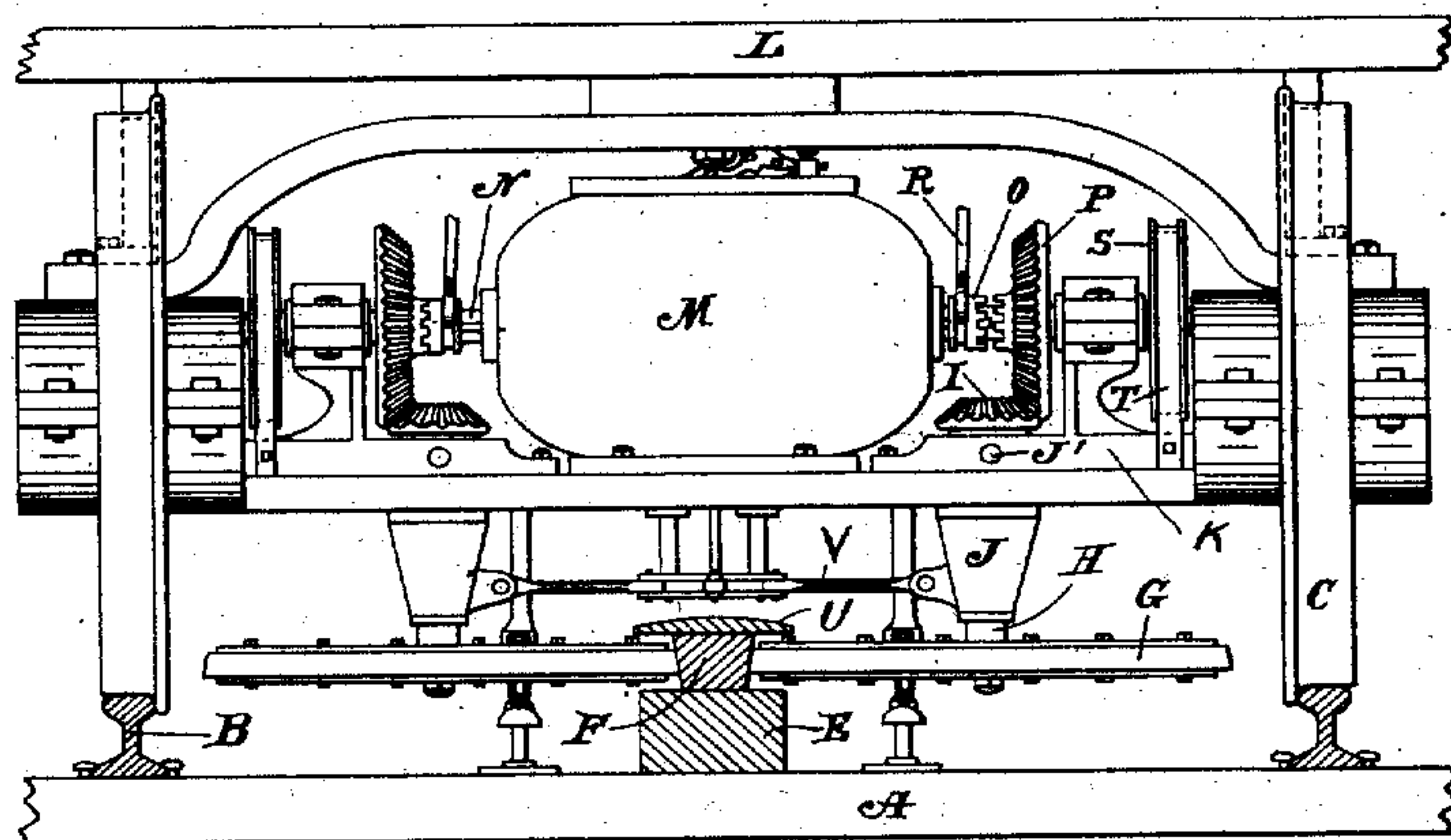
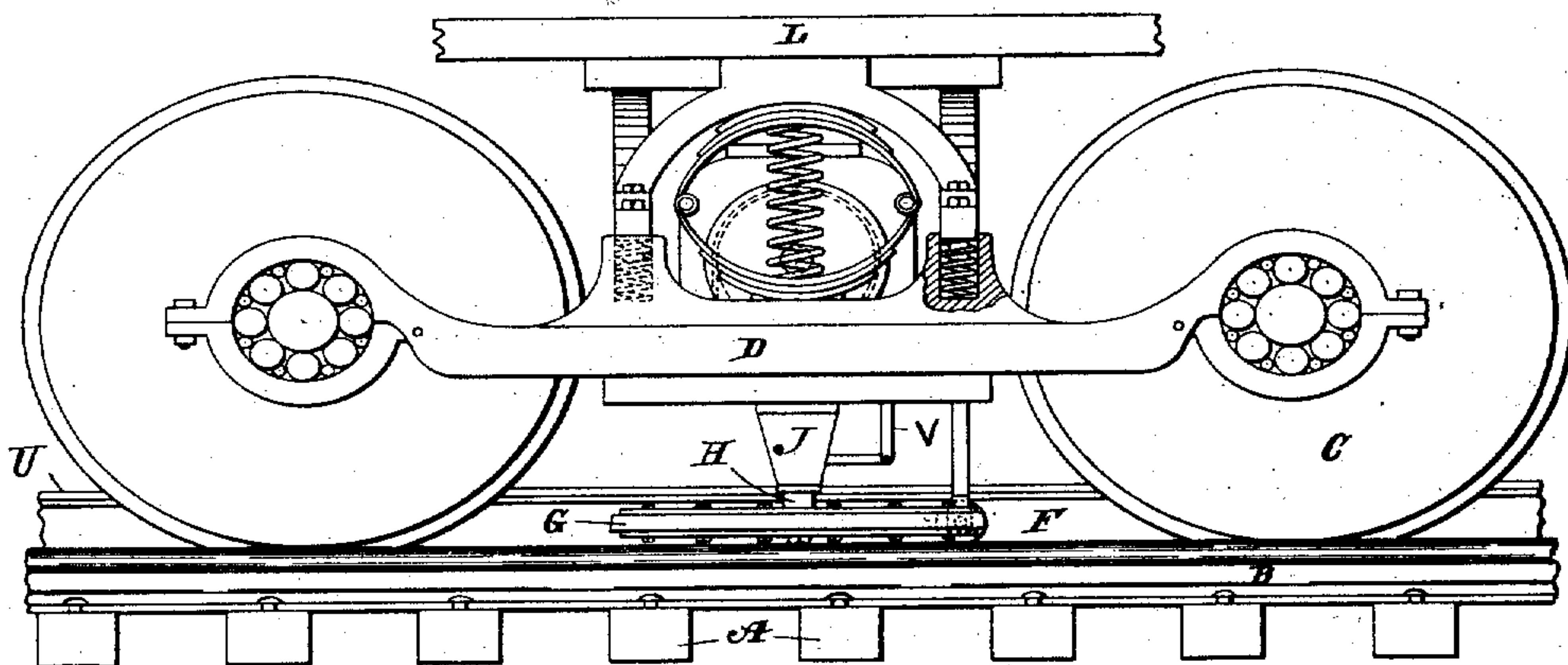


FIG. 2-



WITNESSES

Chas. L. Hyde.

Mattie McGinnis.

INVENTOR

George E. Smith

BY

Hazard & Harpham
ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE E. SMITH, OF PASADENA, CALIFORNIA.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 720,291, dated February 10, 1903.

Application filed November 25, 1901. Serial No. 83,651. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. SMITH, a citizen of the United States, residing at Pasadena, in the county of Los Angeles, State of California, have invented new and useful Improvements in Railway-Cars, of which the following is a specification.

My invention relates to railway-cars primarily designed for elevated railways; and the objects thereof are to provide a car that will easily turn sharp curves, can be propelled at high rates of speed, and can climb heavy grades with perfect safety. I accomplish these objects by the mechanism described herein and illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is an end view of a car-truck and the upper part of the track, the elevated structure being omitted. Fig. 2 is a side view of the same.

In the drawings all of the elevated structure below the cross-ties A has been omitted as not necessary to the illustration of my invention. On the cross-ties are fastened the usual track-rails B, which support the wheels C, that carry the weight of the other parts of the car. The wheels C each have stub-axles and are separately mounted in the truck-frame D and are provided with roller-bearings. They may be arranged in pairs, if desired. I prefer double pairs or four wheels to each truck, as shown. Affixed to the cross-ties, intermediate the supporting-rails, is a central friction-rail-supporting timber E, to which is affixed the friction-rail F, which in cross-section is in shape the frustum of a wedge with the base up. This friction-rail provides a bearing-surface with which the traction-wheels G contact. These traction-wheels are in shape the frustum of a cone, with the pitch to fit the pitch of the friction-rail, preferably in pairs, one each side of the friction-rail, and are rigidly mounted on one end of the shaft H, the other end of which carries driven bevel gear-wheel I. Shaft H is rotative in box J, but has no longitudinal movement therein, such movement being prevented by any well-known devices. Box J is provided with trunnions J', which are pivotally mounted in bearings K, affixed to the truck-frame, thereby permitting a swinging motion of the traction-wheel from and toward

the friction-rail. The truck-frame is connected with the car-frame L by a king-bolt in the usual manner. Mounted on the truck-frame is electric motor M, the armature of which has projecting on each side thereof axles N, which are provided with sliding square-toothed clutches O, which engage with their counterpart in the hub of the driving bevel gear-wheel P, loosely mounted on the motor-shaft to impart motion thereto when desired. These sliding clutches are moved by levers R, which are operated by any suitable means. (Not shown.) On the ends of the motor-shaft are brake-wheels S, which are provided with band-brakes T to brake the car when desired. The traction-wheels on either side of the friction-rail can be operated independently of those on the other side, as by means of clutch O either driving bevel gear-wheel on the motor-shaft may be thrown out of engagement therewith, when it runs merely as an idler. This feature renders the turning of very sharp curves feasible, as the supporting-wheels run independently of each other. On the top of the friction-rail is affixed a safety guard-flange U, which projects over the traction-wheels as an extra precaution to prevent the car from jumping the track. Affixed to the boxes J are bell-crank or other levers V, by means of which the traction-wheels may be caused to bear against the friction-rail with greater or less force, or they may be thrown entirely out of contact therewith. These levers work singly or together, so that one or both traction-wheels may be operated, as desired.

In the drawings I have illustrated my car as being propelled by an electric motor; but any other means may be used to propel the same, the power being applied to rotate the shaft which carries the driving bevel-gear P.

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

1. In a railway-car, means to propel said car comprising a central friction-rail; in shape the frustum of a wedge with the base projecting upward a traction-wheel adapted to contact with said friction-rail, mounted on a shaft; said traction-wheel being in shape the frustum of a cone a shaft rotatively mounted in a box, without longitudinal movement

in said box; a box having trunnions pivotally mounted in bearings affixed to the truck-frame; a bevel-gear mounted on the end of the shaft opposite the traction-wheel; and
5 means to drive said bevel-gear.

2. In a railway-car, a truck-frame; independently-mounted supporting-wheels, rotatively mounted in said frame; a driven axle rotatively mounted in said truck-frame;
10 means to operate said driven axle; a bevel-gear loosely mounted on said axle, having a clutch mechanism in the hub thereof; a sliding clutch non-rotative on said driven axle, adapted to engage the clutch of the bevel-
15 gear and lock the same to the axle and cause it to become a driving-gear; means to operate said sliding clutch; a driven bevel-gear rotatively mounted on an axle, adapted to mesh with the driving bevel-gear; a traction-
20 wheel on the end of said axle opposite the driven bevel-gear; a central friction-rail; a box in which said last axle is rotatively mounted without longitudinal movement therein, having trunnions rotatively mount-
25 ed in bearings, affixed to the truck-frame, and means to cause the traction-wheel to contact with the friction-rail.

3. In a railway-car, a truck-frame; inde-

pendently-moving wheels, separately mount-
ed in and supporting said frame; an electric 30
motor mounted on said frame the armature of which carries oppositely-projecting axles; brake-band wheels, rigidly mounted on the ends of said motor-axles; bevel gear-wheels loosely mounted on said motor-axles; and 35
non-rotative sliding clutches also mounted on said axles adapted to engage and lock said gear-wheels to said axle; two boxes having trunnions pivotally mounted in bearings affixed to the truck-frame, one on each side of 40
the motor; axles rotatively mounted in said boxes, without longitudinal movement therein; bevel-gear rigidly affixed, one to each end of said last axles adapted to mesh with the gear on the motor-axles; traction-wheels rig- 45
idly mounted on the other ends of said axles, and adapted to engage with a friction-rail; a friction-rail, and means to cause said traction-wheels to engage said friction-rail.

In witness that I claim the foregoing I 50
have hereunto subscribed my name this 19th day of November, 1901.

GEO. E. SMITH.

Witnesses:

G. E. HARPHAM,
MATTIE MCGINNIS.

Corrections in Letters Patent No. 720,291.

It is hereby certified that in Letters Patent No. 720,291, granted February 10, 1903. upon the application of George E. Smith, of Pasadena, California, for an improvement in "Railway-Cars," errors appear in the printed specification requiring correction; as follows: Page 1, line 98, the semicolon after the word "friction-rail" should be stricken out and inserted after the word "upward" in line 100, in line 102 a comma should be substituted for the semicolon after the word "shaft", and in line 103 a semicolon should be inserted after the word "cone"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of March, A. D., 1903.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

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F. I. ALLEN,
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