(No Model.) 2 Sheets—Sheet 1.

C. M. SLOAN.

RUNNING GEAR FOR RAILWAY CARS.

No. 459,796. Patented Sept. 22, 1891.

Fig. I

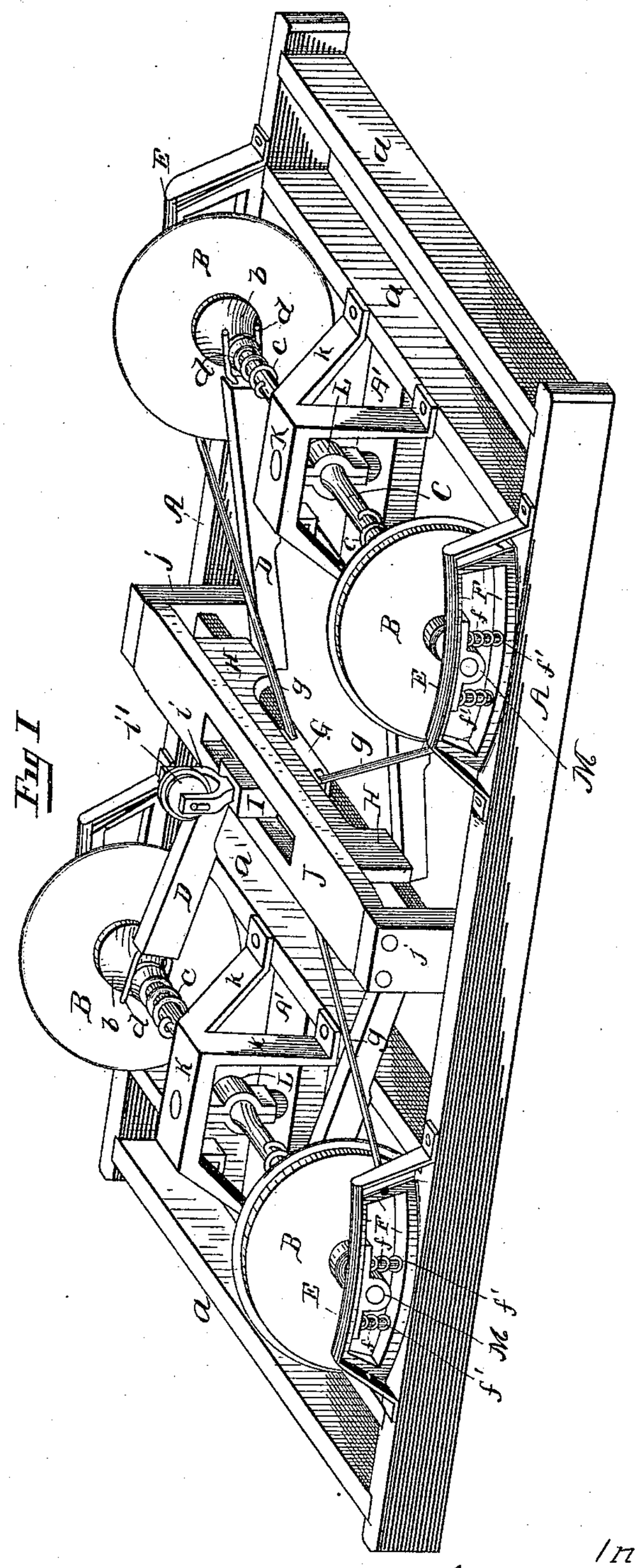
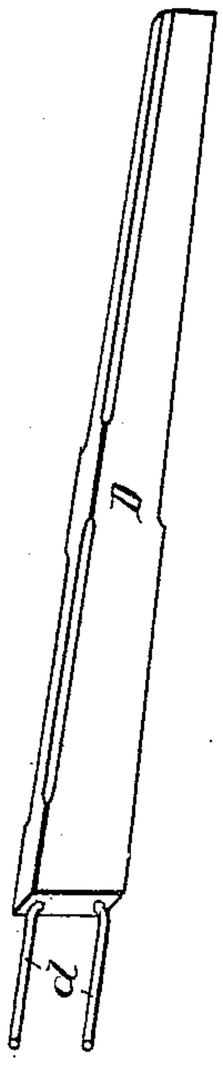


Fig. VI



Witnesses.

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His Attorney.

(No Model.) 2 Sheets—Sheet 2.

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Fig II

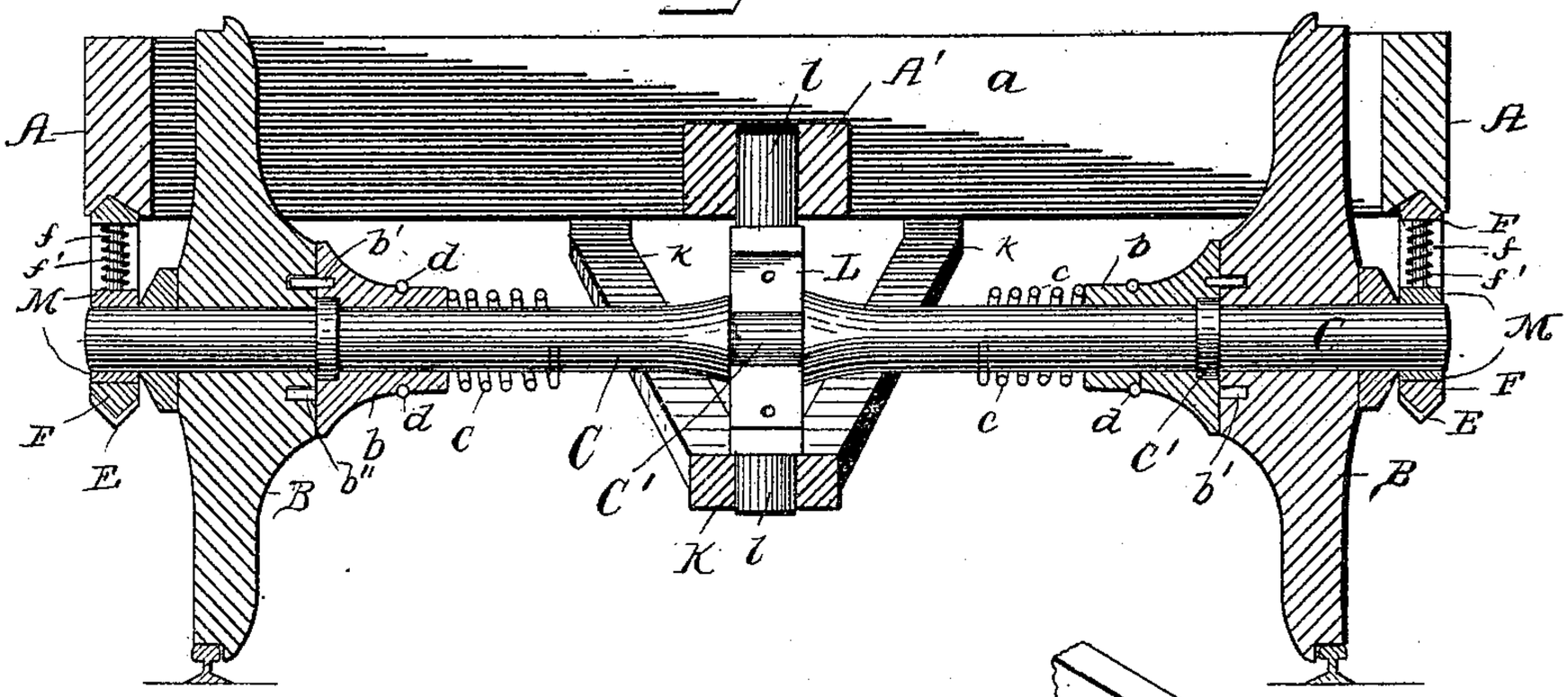


Fig V

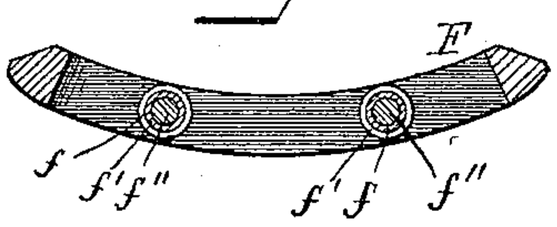
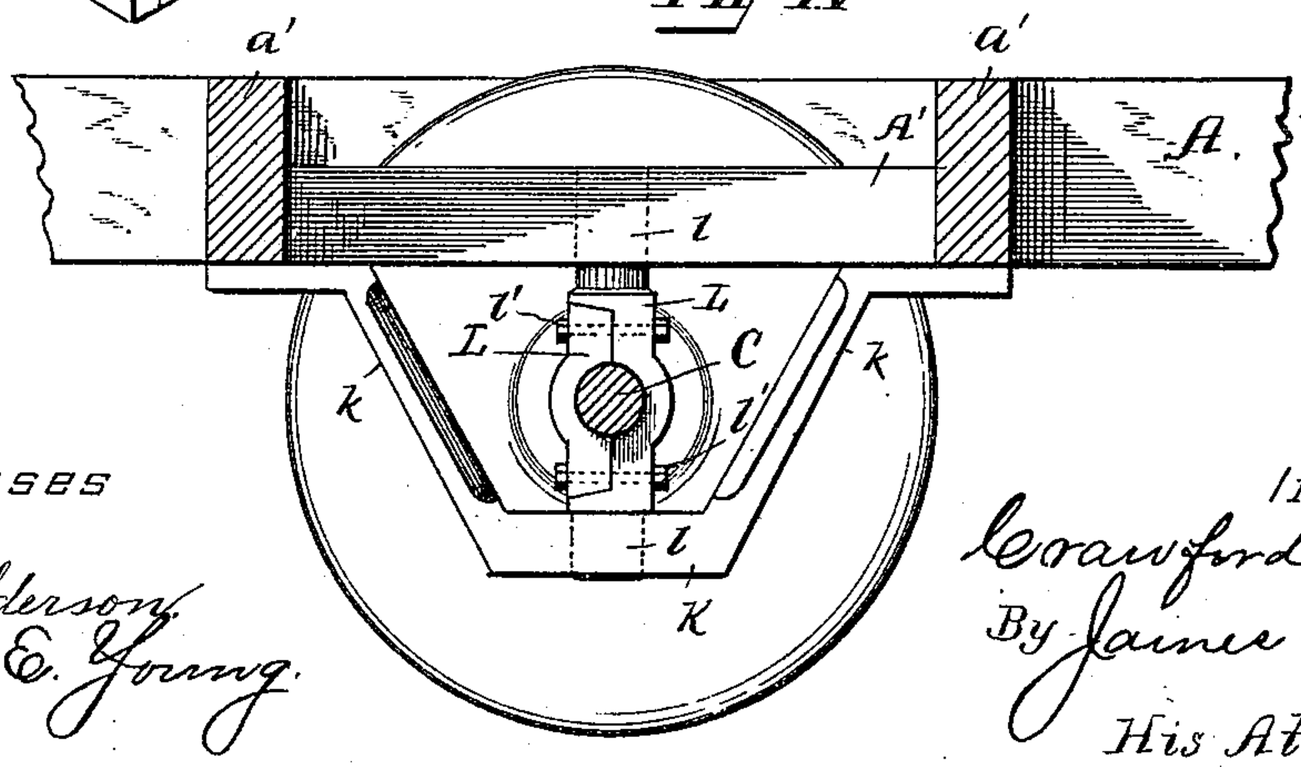


Fig III

Fig IV



Witnesses

R. A. Balderson.
Bessie E. Young.

Inventor:
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By James G. Young
His Attorney

UNITED STATES PATENT OFFICE.

CRAWFORD M. SLOAN, OF KANSAS CITY, MISSOURI.

RUNNING-GEAR FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 459,796, dated September 22, 1891.

Application filed February 5, 1891. Serial No. 380,346. (No model.)

To all whom it may concern:

Be it known that I, CRAWFORD M. SLOAN, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Automatic Anti-Friction Gearing for Railway-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide a mechanism especially adapted to running-gear for cars in passing around cable and other railway curves, thereby avoiding all danger of leaving the track, the great amount of wear, tear, friction, and general destruction incident to wheels, flanges, axles, and rails heretofore encountered.

A further object of my invention is to provide a running-gear for cars which shall automatically compel all the wheels and axles to assume an angle at all points of the curve, which will obviate all friction, all twitching movement experienced in riding around curves, the danger of delay in travel incident to cars leaving the track at any point on such curves, and generally to simplify and regulate the movement of cars at all times in passing the curves. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure I is a perspective view of the entire mechanism inverted, showing the improvements of the invention. Fig. II is a cross-sectional view of wheels, axles, pivotal bearings, and other parts of the mechanism. Fig. III is a perspective view showing the mechanism and parts by which the device is operated. Fig. IV is a detail sectional view of the axle, showing the pivotal boxing and bearings in which the same are supported. Fig. V is a detail sectional view of the movable bearing F, showing the position of the bolts and springs *f*, *f'*, and *f''*. Fig. VI is a detail view in perspective of the levers D, which operate the axles C.

Similar letters refer to similar parts throughout the several views.

A A represent the side bars of the truck, which are connected by the cross-bars *a a a a*.

B B B B are the car-wheels; *b b*, the shoulders, which operate loosely on the axle C, said shoulders being provided with stationary pins *b'*, that fit in corresponding perforations *b'*. (See Fig. II.)

C' is the center of the main axle C, where it is pivotally secured in the pivotal bearing L, which in turn has its bearings in the supporting-frame K and sleeper A'. Said supporting-frame K is properly braced by means of the struts *k*, which are rigidly secured to the cross-bars *a*. (See Figs. I and IV.)

D D are levers, which are secured pivotally to the sliding bar H. (See Fig. III.) The other end of levers D are provided with arms *d d*, which rest in corresponding grooves in the shoulders *b b*.

F is the rotary bearings for the wheels. Their upper and lower surfaces being convex, they are securely held by the corresponding concave grooves in the frame A and the concave surface of the supporting-frames E, which affords the rotary bearing and movement.

f is a sleeve which fits over a bolt *f''*, said sleeve being encircled by a coil-spring *f'*, which is for the purpose of preventing the jolting which would otherwise result.

G G are the blocks, which are secured in frame J, and to said blocks are secured guiding-rods *g g g g*, which are also secured to the bearings F, so that when said blocks are moved from side to side the wheels are turned to such a degree as to keep them at the proper angle to the track.

H H is the sliding frame heretofore referred to, which is secured in the frame J, and is operated by the carrying-wheel *i'*, which is secured in the bearing *i*, said bearing being properly secured to the sliding bar H, which carries blocks G G G G.

I is the block in which the bearing *i*, carrying wheel *i'*, is secured.

J is the frame for carrying sliding bars and other attachments.

K is the frame for holding bearing for pivotal boxing L. The pivotal bearing L, giving pivotal motion to wheels, is made as illustrated in Fig. IV, the two sides being secured by means of bolts *l'*.

M M are the boxings, which are secured in the bearings F. These boxings are provided

with perforations which are large enough to pass over the sleeve *f*, so that a springy motion is obtained.

While my invention and the drawings for its illustration are prepared with a view to its adaptation to four or eight wheeled cars for cable railways, to be controlled by a central pivotal carrying-wheel *i'* operating in the conduit-slot, yet I do not intend to be confined to a rod or carrying-wheel operated in a slot as the controlling medium for guiding the car-wheels. Nor do I intend to confine my invention to running-gears for cable-railway carriages, as it is equally adapted to any railway-carriage having four or more wheels. In case of six-wheel carriages the same lateral or controlling movement may be obtained from the central part of the middle axle by connecting the guiding-rods *g g g g* to the center of the middle axle by any ordinary joint connection which will produce the same result.

To understand the operation of my running-gear, it will be observed that there is no difference in the construction of the wheels, as the movement of the entire wheels to any desired angle on any point or curve is, in the case of cable railways, derived from the carrying wheel or rod operated in the slot, while the power to guide the wheels is radiated from this central mechanism to all the wheels at the same instant and with the same power. This is accomplished in the case of cable railways where only four wheels are used by the central connecting-blocks G G. To these blocks are connected guiding-rods *g g*, running diagonally to and connected with the bearings to each wheel, so that the least movement of the blocks G G controls each wheel and keeps them at all times while passing the curve at the proper angle corresponding to the movement of the carrying wheel or rod in the slot.

It will be observed that an essential feature of my invention is the rotary movement of the bearings to each wheel and the pivotal connection in the center of each axle. These rotary bearings are provided with the supporting frame-work E E E, which, being rigidly bolted to the general frame-work of the car, supports the axle-bearing F, while permitting the rotary motion of the axle-bearing. This is an essential feature of the invention, without which nothing satisfactory could be accomplished. Each axle, regardless of the number of wheels, is provided with a frame-work and pivotal bearing in the center. This frame-work K supports the pivotal bearing L, while affording general support to the axle. It also prevents any lateral movement of the axle C, which is necessary, as all lateral movement required by the wheels to avoid friction is provided for by the movable shoulders *b*, playing on the axles on the inside of each wheel and held in any desired position by the coil-spring *c*, the levers D, and the arms *d*, supported in the grooves.

For ordinary purposes the wheels B and the shoulders *b* are locked together by ratchets or bolts *b'*, and in turn are locked to the axle C to secure movement of the wheels corresponding to the axle. At this point it should be noticed that in case of ordinary railway-cars the lateral movement is obtained by means of the levers D and the arms *d*, whereby the shoulder *b* is thrown into or out of locking position with the wheels B and the axles C. This is necessary at times to give the wheels liberty for increased motion from the axle to overcome the difference in length of the rails in passing curves.

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

1. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement in a corresponding concave frame-work and circular groove in the side bar supporting the car, as set forth.

2. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement in corresponding concave frame-work and circular groove in the side bar supporting the car, and a supporting-frame E, rigidly bolted to frame-work A, having a concave surface in which the bearing F obtains its rotary movement, as set forth.

3. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement in corresponding concave frame-work and circular groove in the side bar supporting the car, a supporting-frame E, rigidly bolted to frame-work A, having a concave surface in which the bearing F obtains its rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by the coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting frame-work G G, and guiding-rod or carrying-wheel *i'*, operating in the slot, substantially as set forth.

4. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement in corresponding concave frame-work and circular groove in the side bar supporting the car, a supporting-frame E, rigidly bolted to frame-work A, having a concave surface in which the bearing F obtains its rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting

frame-work G G, and guiding-rod or carrying-wheel *i'*, operating in the slot, the frame-work K, the sleeper A', the pivotal bearing L, all supporting the axle C, preventing any lateral motion of the axle, but allowing of a rotary movement of the axle-bearings, as set forth.

5. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement in corresponding concave frame-work and circular groove in the side bar supporting the car, a supporting-frame E, rigidly bolted to frame-work A, having a concave surface in which the bearing F obtains its rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by the coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting frame-work G G, and guiding-rod or carrying-wheel *i'*, operating in the slot, the frame-work K, the sleeper A', the pivotal bearing L, all supporting the axle C, preventing any lateral motion of the axle, but allowing of a rotary movement of the axle-bearing, and the guiding-rods *g g g g*, rigidly connected with the bearings F of each wheel and extending to and meeting at a common central joint connection to a guiding-rod or carrying-wheel *i'*, operating in the slot of the cable-conduit for the purpose of controlling the wheels at the desired angle in passing curves and for self-adjustment when resuming a straight direction, as set forth.

6. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement in corresponding concave frame-work and circular groove in the side bar supporting the car, a supporting-frame E, rigidly bolted to frame-work A, having a concave surface in which the bearing F obtains a rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by the coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting frame-work G G, and guiding-rod or carrying-wheel *i'*, operating in the slot, the frame-work K, the sleeper A', the pivotal bearing L, all supporting the axle C, preventing any lateral motion of the axle, but allowing of a rotary movement of the bearings in which the bearing F obtains its rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by the coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting frame-work G G, and guiding-rod or carrying-wheel *i'*, operating in the slot, the frame-work K, the sleeper A', the pivotal bearing L, all supporting the axle C, preventing any lateral motion of the axle, but allowing of a rotary movement of the axle-bearing, the guiding-rods *g g g g*, rigidly connected with the bearings F of each wheel and extending to and meeting at a common central joint connection to a guiding-rod or carrying-wheel *i'*, operating in the slot of the cable-conduit for the purpose of controlling the wheels at the desired angle in passing curves and for self-adjustment when resuming a straight direction, a central frame-work, either separate, in the case of only four wheels, or connected with the middle axle, in case of six-wheel gearing, consisting of any desired center piece, to which is connected by joints having elbow-play the guiding-rods *g g g g* for controlling the rotary movement of the wheels in passing curves and self-adjustment when attaining a straight course, as set forth.

7. In combination with any ordinary frame-work for supporting railway-cars, the rotary bearing F, of convex bearing-surface, having a circular movement on corresponding concave frame-work and circular groove in the side bar supporting the car, a supporting-frame E, rigidly bolted to frame-work A, having a concave surface in which the bearing F obtains a rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by the coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting frame-work G G, guiding-rod or carrying-wheel *i'*, operating in the slot, the frame-work K, the sleeper A', the pivotal bearing L, all supporting axle C, preventing any lateral motion of the axle, but allowing of a rotary movement of the bearing in which the bearing F obtains its rotary movement, the shoulder *b*, connecting the wheel B and the axle C by means of locking bolts or ratchets which may be thrown out of or into gear by the coil-spring *c*, the lever D and the arms *d*, answering the movement of the central and connecting frame-work G G, the guiding-rod or carrying-wheel *i'*, operating in the slot, the frame-work K, the sleeper A', the pivotal bearing L, all supporting the axle C, preventing any lateral motion of the axle, but allowing of a rotary movement of the axle-bearing, the guiding-rods *g g g g*, rigidly connected with the bearings F of each wheel and extending to and meeting at a common central joint connection to a guiding-rod or carrying-wheel *i'*, operating in the slot of the cable-conduit for the purpose of controlling the wheels at the desired angle in passing curves and for self-adjustment when resuming a straight direction, a central frame-work, either separate, in case of only four wheels, or connected with the middle axle, in case of six-wheel gearing, consisting of any desired center piece, to which is connected by joints having elbow-play the guiding-rods *g g g g* for controlling the rotary movement of the wheels in passing curves and self-adjustment when resuming a straight

course, the shoulders *b b*, stationary pins *b'*, perforations *b''*, center of main axle C', coil-spring *c*, pivotal bearing L, supporting-frame K, sleeper A', struts *k*, levers D, sliding bar H, arms *d d*, rotary bearing F, supporting-frame E E E E, sleeve of coil *f*, coil-spring *f'*, bolt *f''*, blocks G G, frame J, guiding-rods *g g' g g*, block I, carrying or slot wheel *i'*, bearing *i*, bolts *l'*, and boxing M, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CRAWFORD M. SLOAN.

Witnesses:

BESSIE E. YOUNG,

DAISY B. SMALLEY.