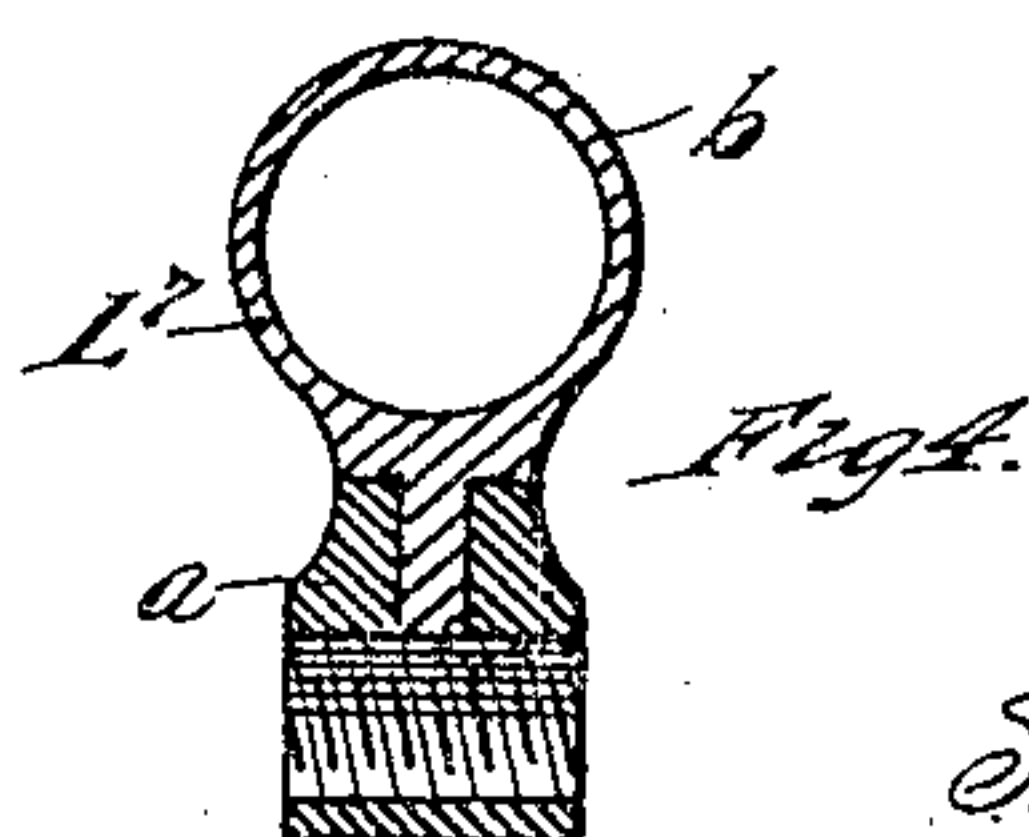
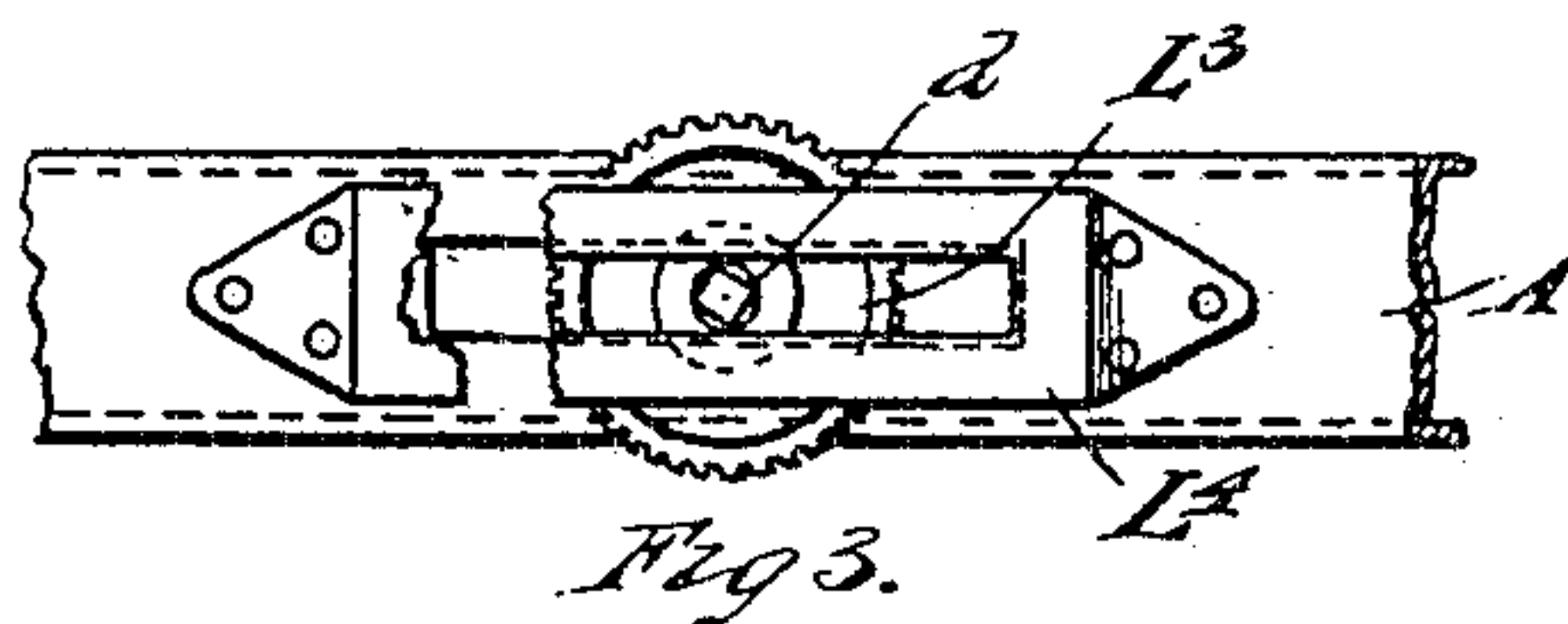
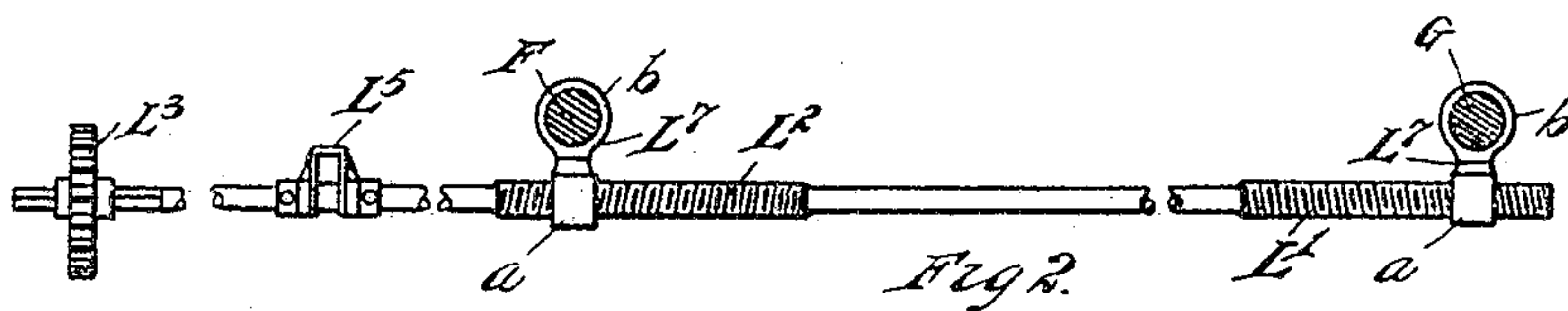
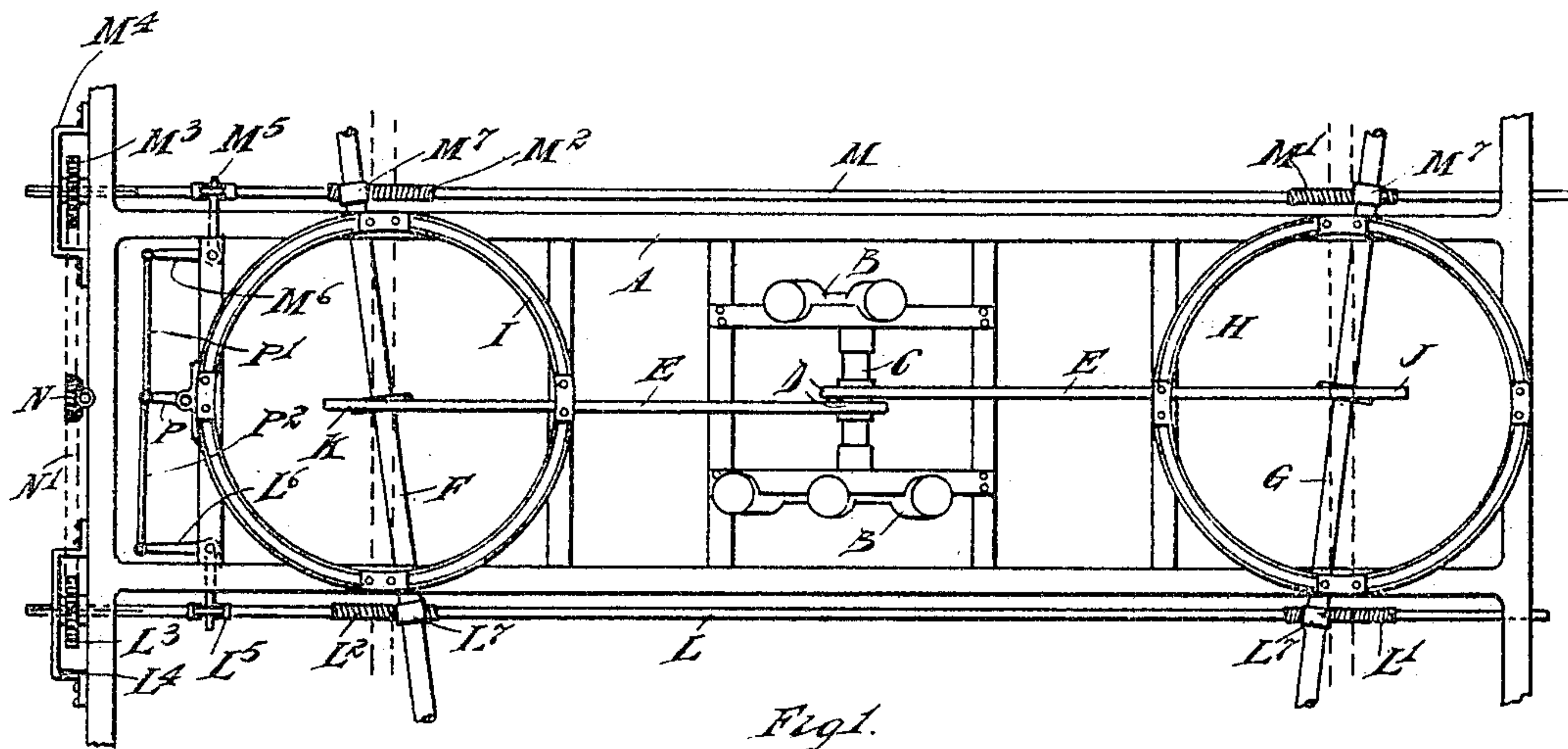


No. 798,813.

PATENTED SEPT. 5, 1905.

S. J. MACFARREN.  
STEERING GEAR FOR AUTOMOBILES.

APPLICATION FILED JUNE 13, 1904.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

SAMUEL JAMES MACFARREN, OF PITTSBURG, PENNSYLVANIA.

## STEERING-GEAR FOR AUTOMOBILES.

No. 738,813.

Specification of Letters Patent.

Patented Sept. 5, 1905.

Application filed June 13, 1904. Serial No. 212,240.

*To all whom it may concern:*

Be it known that I, SAMUEL JAMES MACFARREN, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented a certain new and useful Improvement in Steering-Gear for Automobiles; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to vehicle-gears for self-propelled vehicles.

In the accompanying drawings, Figure 1 is a plan view of the chassis or frame and attached parts of a vehicle embodying my invention. Figs. 2, 3, and 4 are detail views.

A is the frame, having a motor B mounted thereon.

C is the main shaft of the motor.

D indicates the sprocket-wheels upon the shaft C.

E E are chains passing over the sprocket-wheels D and leading to sprocket-wheels J K.

F G are the axles of the vehicle, pivoted by fifth-wheels H I to the frame A. The sprocket-wheels J K are connected by a gimbal-joint to the axles F G, so that said wheels may remain in one plane, though the angle at which the axles are located with reference to said plane may change.

The construction of the sprocket-wheels J K and their connection to the shaft are described in another application for Letters Patent made by me and serially numbered 224,059.

L M are rods extending between the axles F G upon opposite sides of the frame A and secured to said axles by pivoted hangers L' M', consisting of rings *b*, surrounding and adapted to slide along the axle, and a block *a*, pivoted to said ring beneath the same. The block *a* is provided with a screw-threaded aperture, with the screw-threads of which the screw-threads L' L<sup>2</sup> M' M<sup>2</sup> upon the rods L M engage. The screw-threads L' on the end of a rod L at one end of the vehicle are opposite to those at the other end. Thus if one pair is right-handed the other is left-handed. Thus while the rods L M are free to move longitudinally with reference to the frame they are secured to the axles by their screw-threads engaging with the screw-threads in the blocks *a*, secured to the axles by the rings *b*.

L<sup>3</sup> M<sup>3</sup> are sprocket-wheels pivoted upon the frame A and provided with squared apertures *d* at their centers. The rods L M are squared at their ends and pass through said apertures so as to slide longitudinally, but to be restrained from angular motion relative to said sprocket-wheel.

N is a sprocket-wheel secured to the frame A at the center and front thereof.

N' is a sprocket-chain passing over the sprocket-wheel N and the sprocket-wheels L<sup>3</sup> M<sup>3</sup>. Said sprocket-wheels are restrained from lateral motion by yokes L<sup>4</sup> M<sup>4</sup>, secured to the frame A and passing said wheels.

P is a lever-arm adapted to be moved by a steering-wheel or equivalent device. (Not shown.)

L<sup>6</sup> M<sup>6</sup> are bell-crank levers pivoted upon the frame A and having one arm of each engaging a yoke L<sup>5</sup> M<sup>5</sup> upon the rods L and M.

P' P<sup>2</sup> are connecting-rods connecting the arm P with the arms of the bell-crank levers L<sup>6</sup> M<sup>6</sup>.

The yokes L<sup>5</sup> M<sup>5</sup> are secured to the rods L M, so that said rods may turn independently of the yoke, but cannot move longitudinally independent thereof.

The operation of the above-described apparatus is as follows: The sprocket-wheels J K are driven by the motor B through the chains E in the usual manner, turning both of the axles F G to propel the carriage. When it is desired to turn the vehicle about a center with the vehicle at right angles to a radius of said center, the sprocket-wheel N is rotated, turning the wheels L<sup>3</sup> M<sup>3</sup>, which carries with them the rods L M. This turns the axles F G by the action of the screw-threads L' and L<sup>2</sup>, M' and M<sup>2</sup> upon the screw-threads of the hangers L' M', as indicated in Fig. 1, turning both axles so that a less angular turn of an axle will be required than when only one axle is turned to steer the vehicle.

When it is desired to move the vehicle obliquely without turning it, the axles F G are put into parallel positions and are turned about their centers by moving the lever P and drawing forward upon one of the rods L and M and pushing back upon the other, thus turning the axles and keeping them parallel.

It will be observed that the axles F G are always firmly connected by the rods L M and that the same apparatus is used either in turning about a center while moving forward at right angles to a radius to said center or when moving obliquely. It will also be ob-



served that all the wheels may be used both for steering and traction purposes.

What I claim is—

1. In a self-propelled vehicle, the combination of a frame, two axles pivoted to said frame, and apparatus connecting said axles between points at distances from said pivots, said apparatus being adapted to turn said axles in opposite directions and to move with said axles when the same are turned in the same direction.

2. In a self-propelled vehicle, the combination of a frame, two axles pivoted to said frame, and a rod extending between said axles, said rod being provided with a right-handed screw-thread toward one end and a left-handed screw-thread toward the other end, said screw-threads engaging screw-threads respectively upon said shafts, said rod being adapted to be rotated and to be moved longitudinally.

3. In a self-propelled vehicle, the combination of a frame, two axles pivoted to said frame, and a rod upon each side of said pivot, each of said rods being provided with a right-handed screw-thread at one end and a left-handed screw-thread at the other end, said screw-threads engaging screw-threads upon said axles, said rod being adapted to be rotated and to be moved longitudinally.

4. In a self-propelled vehicle, the combination of a frame, two axles pivoted to said frame, and a rod upon each side of said pivot, each of said rods being provided with a right-handed

screw-thread at one end and a left-handed screw-thread at the other end, said screw-threads engaging screw-threads upon said axles, said rod being adapted to be rotated and to be moved longitudinally.

5. In a self-propelled vehicle, the combination of a frame, two axles pivoted to said frame, and a rod upon each side of said pivot, each of said rods being provided with a right-handed screw-thread at one end and a left-handed screw-thread at the other end, said screw-threads engaging screw-threads upon said axles, and means for rotating said rods simultaneously.

6. In a wheeled vehicle, the combination of the frame connected with the axle by duplicate fifth-wheels or turn-tables, and means connecting said axles and independent of the frame adapted to constrain said axles to turn at equal angles in the same or in opposite directions.

7. In a wheeled vehicle, the combination of a pivoted front axle, and a pivoted rear axle, means for connecting said axles together at eccentric points, said connecting means being capable of adjustment to bring together or separate the connected points, and means for rotating one of said axles.

In testimony whereof I sign this specification in the presence of two witnesses.

SAMUEL JAMES MACFARREN.

Witnesses:

JOHN W. MOORE,  
IRENE PATTERSON.