

No. 672,713.

Patented Apr. 23, 1901.

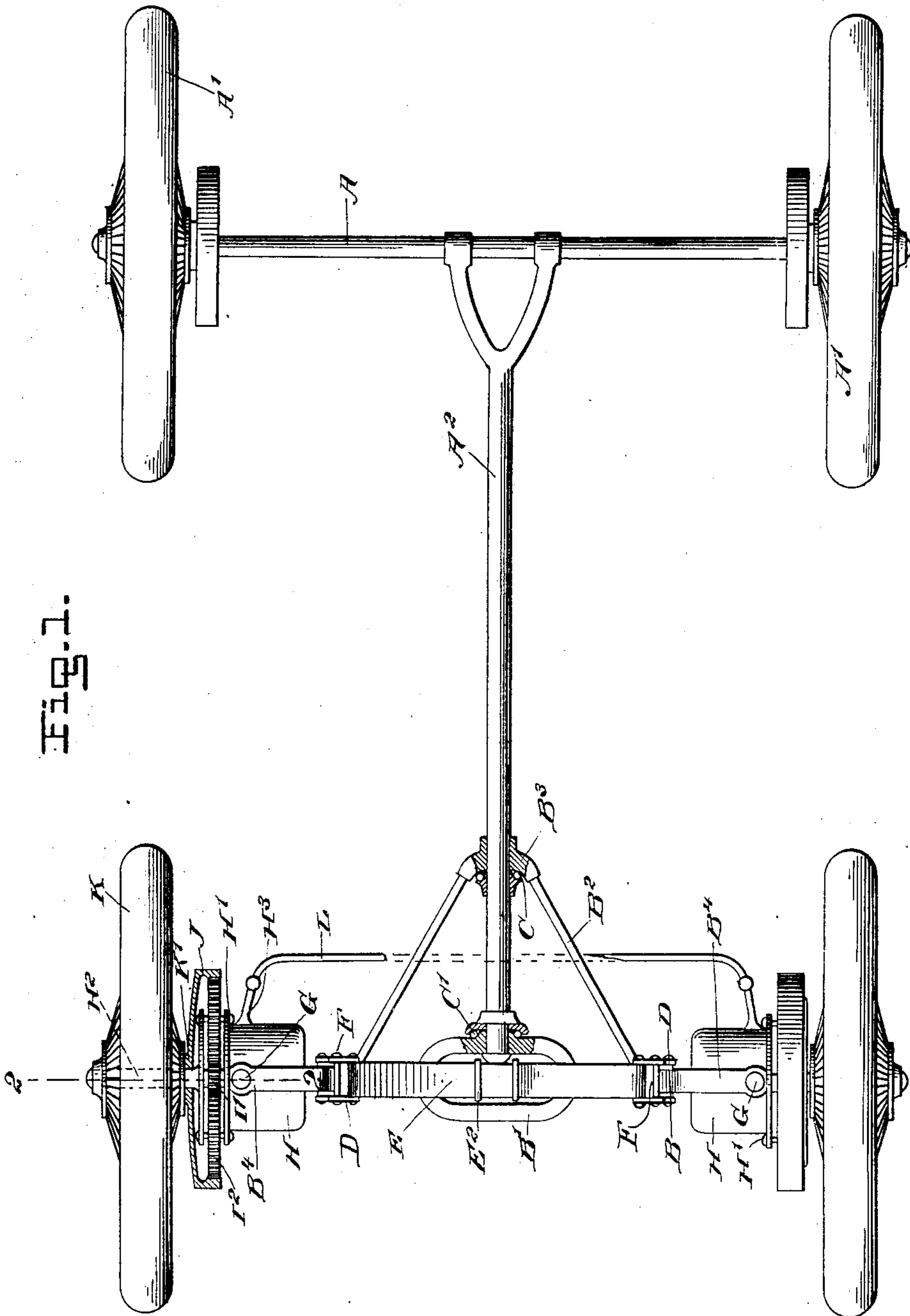
E. SANCHIS.  
HORSELESS CARRIAGE.

(Application filed Dec. 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

Fig. 2.

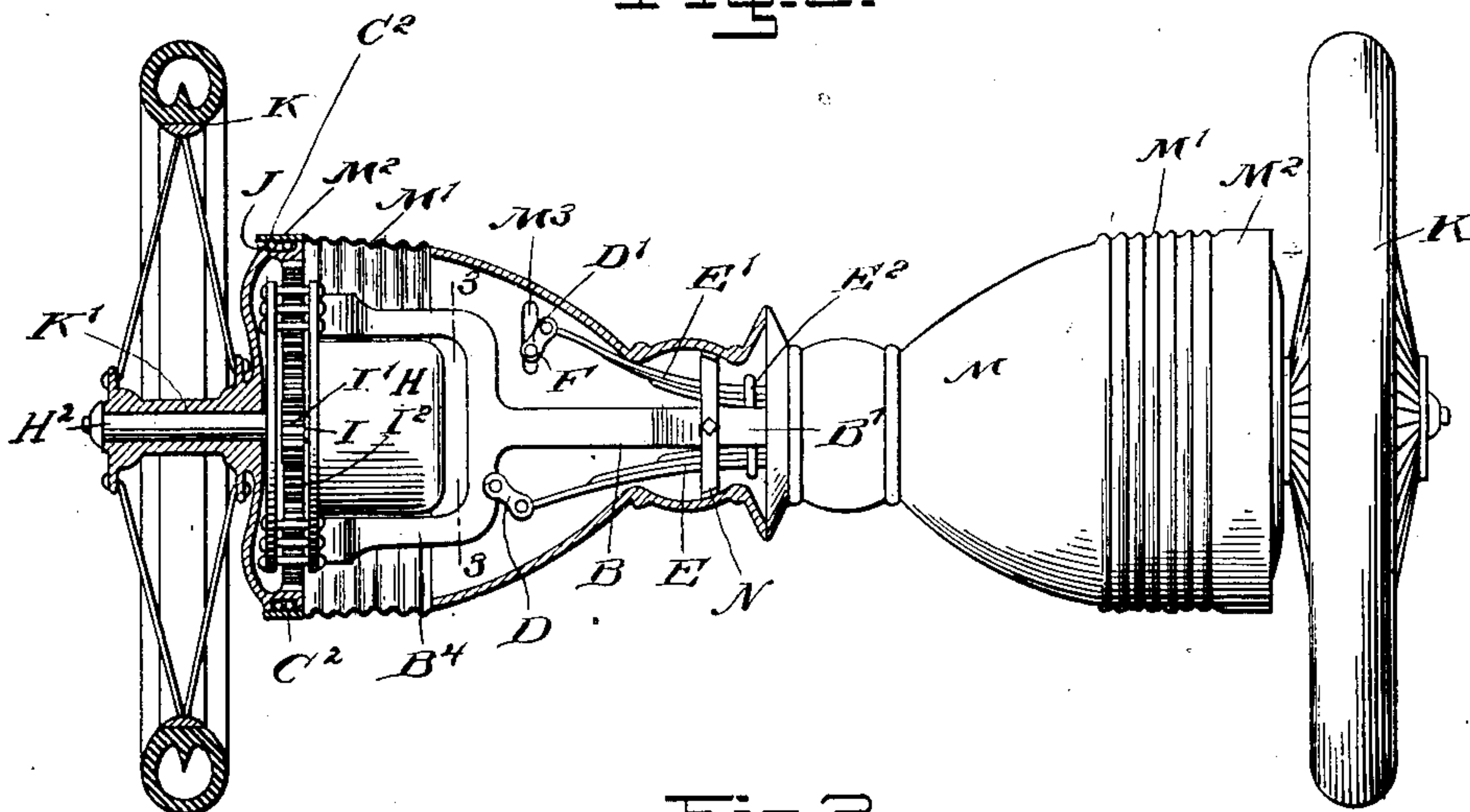


Fig. 3.

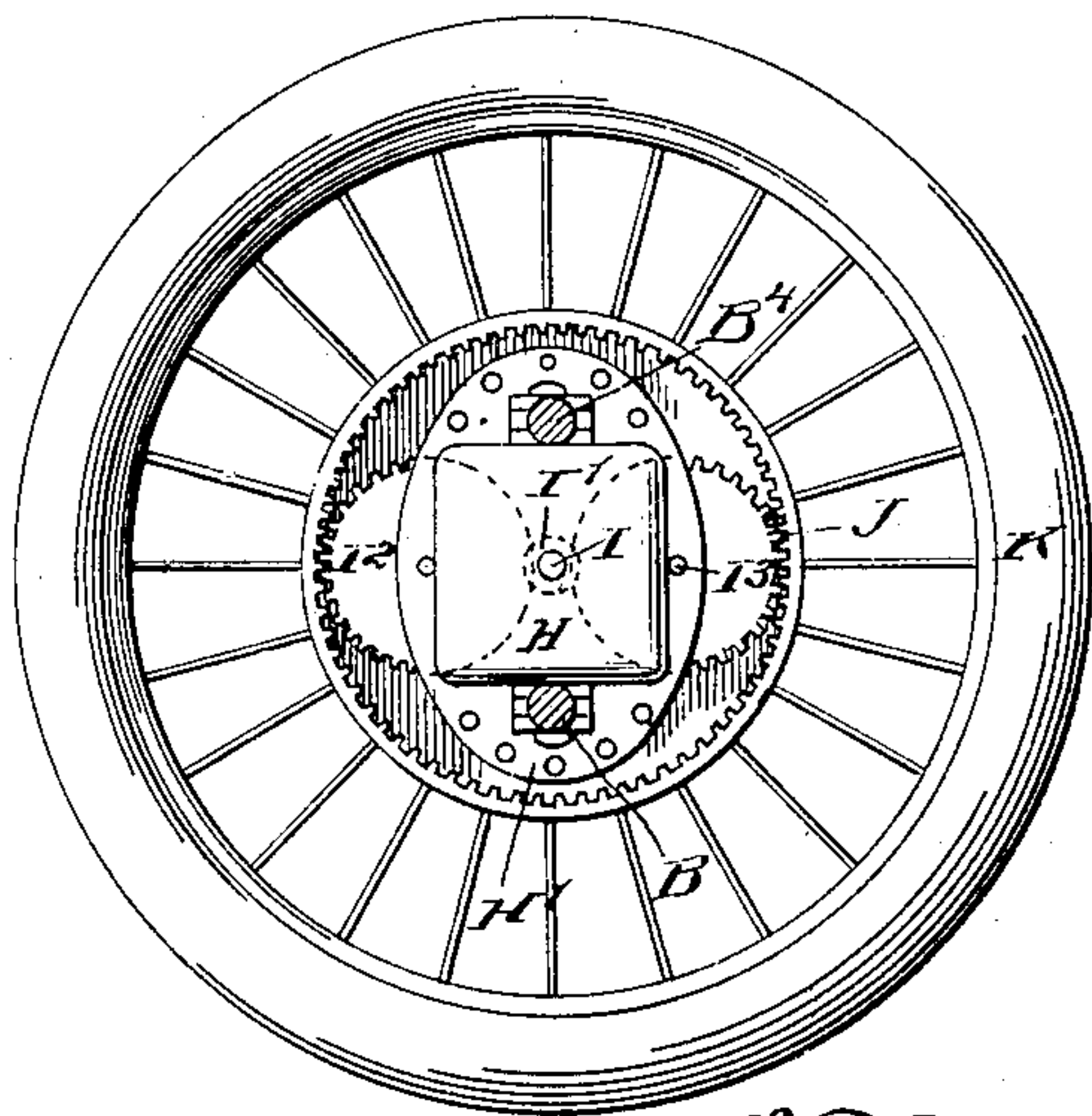
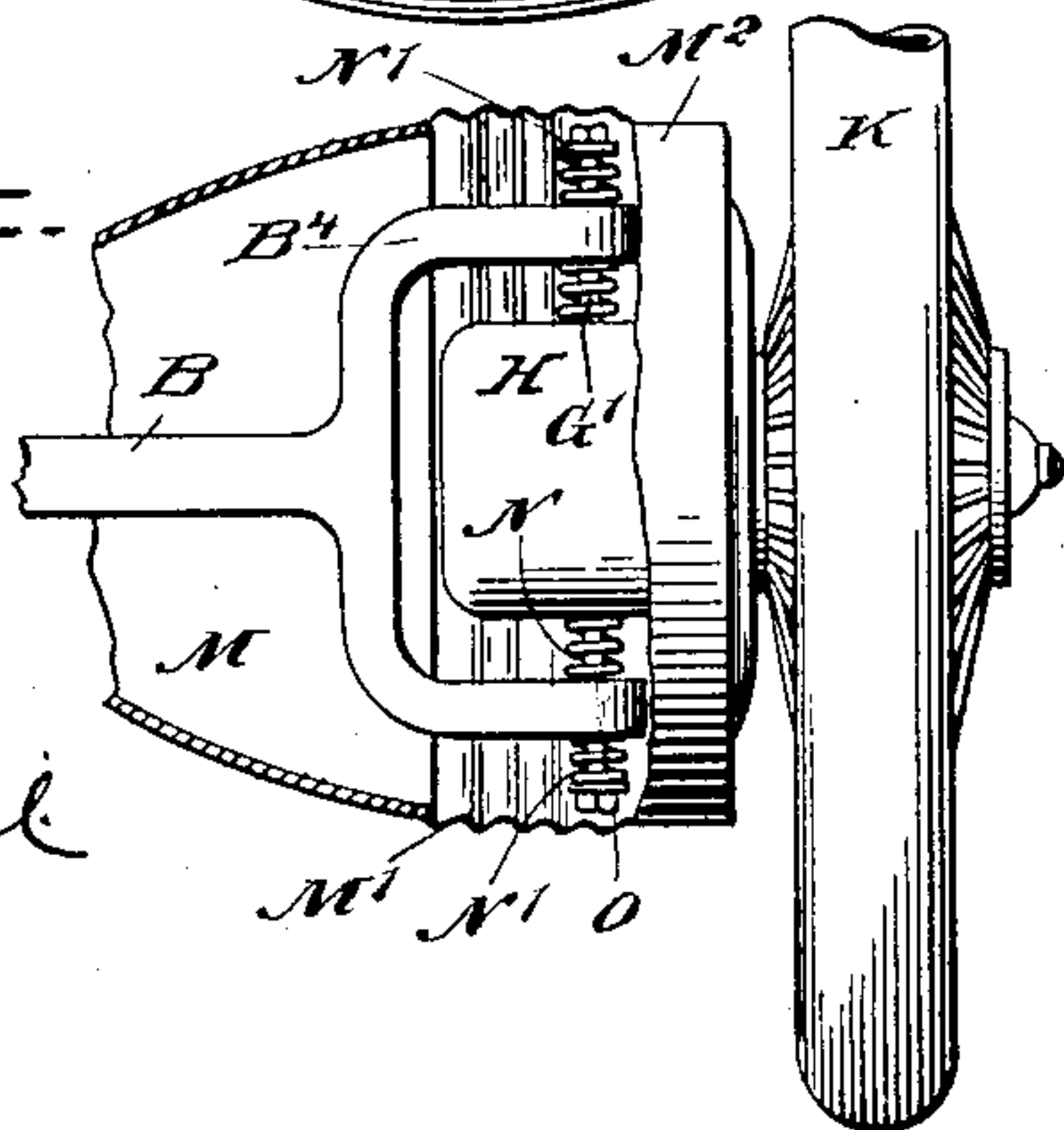


Fig. 4.



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# UNITED STATES PATENT OFFICE.

ENRIQUE SANCHIS, OF MADRID, SPAIN.

## HORSELESS CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 672,713, dated April 23, 1901.

Application filed December 3, 1900. Serial No. 38,511. (No model.)

*To all whom it may concern:*

Be it known that I, ENRIQUE SANCHIS, a subject of the King of Spain, and a resident of Madrid, Spain, have invented new and useful Improvements in Horseless Carriages, of which the following is a full, clear, and exact description.

My invention relates to horseless carriages, and particularly to that class in which the motor is mounted upon a fore-carriage.

The object of my invention is to provide a simple, strong, and easily-steered construction of the above-indicated class.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan of the running-gear of the carriage with parts in section. Fig. 2 is an elevation of the fore-carriage with parts in section on line 2 2 of Fig. 1. Fig. 3 is a cross-section on the line 3 3 of Fig. 2, and Fig. 4 is a side elevation showing a spring-support for the motor.

The running-gear consists of a body provided with wheels, and the rear part of the carriage may be constructed in any approved manner. As shown, it comprises a rear axle A, with rear wheels A' and a central longitudinal or reach member A<sup>2</sup>, connected pivotally with the fore-carriage, so that each part can swing relatively to the other about an axis extending lengthwise of the running-gear.

The fore-carriage comprises an axle B, having an open enlarged central portion B' of oval shape, and rearwardly-converging braces B<sup>2</sup>, which meet at a socket B<sup>3</sup>. Ball-bearings C C' are preferably located at the socket B<sup>3</sup> and at the rear member of the oval portion B' to journal the reach-rod A<sup>2</sup>. The outer ends of the axle B are forked, the fork member B<sup>4</sup> being superposed, as shown best in Fig. 1, and to each lower fork member is attached a link D, (preferably pivotally,) and the lower end of the link is connected with one end of an upwardly-convexed semi-elliptical supporting-spring E. The central portion of this spring fits into the oval portion B' of the axle and has vertical play therein. The central

portion of the spring E is connected, by hoops E<sup>2</sup> or other means which pass through the oval portion B', with the central portion of a downwardly-convexed semi-elliptical spring E', the ends of which are attached to the upper ends of links D', connected at their lower ends with rods F or other parts for supporting the carriage-body. (Not shown.)

The fork members B<sup>4</sup> receive the alining vertical pivots G of a motor frame or casing H, which contains a motor, (not shown,) preferably an electric motor, and to the casing are secured two spaced vertical plates H', and between said plates is mounted centrally on the motor-shaft I a pinion I', in mesh with gear-wheels I<sup>2</sup>, journaled at I<sup>3</sup> on the plates H'. The wheels I<sup>2</sup> engage interiorly with a toothed rim J, rigidly connected or integral with the hub K' of the front wheel K, said hub being mounted to turn on an axle H<sup>2</sup>, projected outwardly from the outer plate H'.

To turn the wheels K for the purpose of steering the carriage, I provide lugs H<sup>3</sup> on the frame H, and said lugs may be connected by a rod L and operated by any suitable steering mechanism.

To protect the gearing, I prefer to provide a tubular case M, secured to axle B by supports N and connected by a flexible bellows portion M' (made, for instance, of leather) with a ring M<sup>2</sup>, surrounding the toothed rim J loosely to allow the rim to swing relatively to the central case M. Balls C<sup>2</sup> are placed between the rim J and ring M<sup>2</sup>. The case M has vertical slots M<sup>3</sup> for the passage of the rods F. The protecting-case and its connections are shown in Fig. 2 only.

It will be seen that each wheel has its own motor, thus rendering the use of differential gearing unnecessary; also, since the motor swings with the wheel in the steering motion of the latter the position of the motor with respect to the wheel is always the same and a very simple construction is the result.

In some cases it may be desirable to secure greater elasticity to reduce jars, particularly with powerful and heavy motors. To this end I may provide springs N N' on the pivots G' of the motor-frame H, the springs N being interposed between said frame and the fork members B<sup>4</sup>, while the springs N' are located around the pivots G' exteriorly of the fork



members. Adjusting screws or nuts O permit of varying the tension of the springs N N'. The pivots G' are longer than the pivots G, hereinbefore described, and slide up and down  
 5 in the fork members B<sup>4</sup>, it being understood that the motor-frame H is properly spaced from the fork members for this purpose.

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

1. In a horseless carriage, the combination of a wheel having a toothed ring, a motor having its drive-shaft located centrally relatively to said ring, and driving connections  
 15 from said shaft to a plurality of points of the said ring.

2. In a horseless carriage, a running-gear having on each side driving ground-wheels mounted to rotate about axes capable of  
 20 swinging about vertical pivots, and motors mounted to swing with the wheels in their steering movement, and having their drive-shafts located centrally of the said wheels.

3. In a horseless carriage, a running-gear  
 25 having on each side driving ground-wheels mounted to rotate about axes capable of swinging about vertical pivots, separate motors for the driving-wheels located on opposite sides of the carriage, each motor being  
 30 mounted to swing with the respective wheel, and having its drive-shaft located centrally of the said wheel, and transmission mechanism from said drive-shaft to a plurality of points of the wheel.

35 4. In a horseless carriage, the combination

of the axle having superposed fork members at its ends, a frame pivotally supported between said fork members, a wheel-axle projecting outwardly from said frame, a motor-shaft journaled in said frame, a pinion on said  
 40 shaft, gear-wheels meshing with said pinion and journaled on the said frame, and a ground-wheel journaled on said wheel-axle and provided with a toothed rim meshing with said gear-wheels. 45

5. In a horseless carriage, the combination of the body of the running-gear, frames pivotally connected with the said body on each side to swing about vertical axes, a wheel-axle projected outwardly from each frame, a  
 50 motor-shaft journaled in said frame, a pinion on said shaft, gear-wheels meshing with said pinion and journaled on the said frame, and a ground-wheel journaled on said wheel-axle and provided with a toothed rim meshing 55 with said gear-wheels.

6. In a horseless carriage, a running-gear body, frames provided with axles and mounted to swing on the body about vertical axes, a wheel journaled on each of the axles, and  
 60 a case having a rigid central portion, and flexible side portions arranged to follow the swinging movement of the said frames.

In testimony whereof I have signed my name to this specification in the presence of  
 65 two subscribing witnesses.

ENRIQUE SANCHIS.

Witnesses:

JOHN LOTTA,

EVERARD BOLTON MARSHALL.