No. 794,716. PATENTED JULY 18, 1905.

J. E. KIMBLE.

STEERING GEAR FOR MOTOR VEHICLES.

APPLICATION FILED SEPT. 12, 1904.

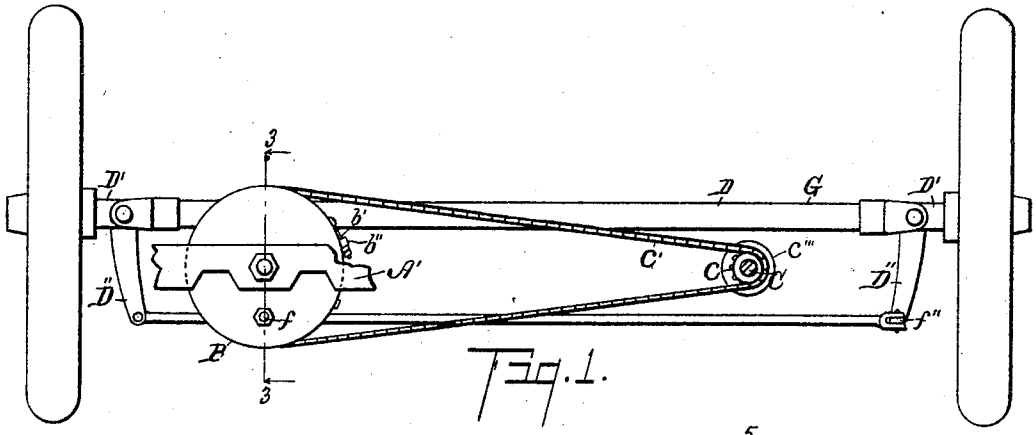


Fig. 1.

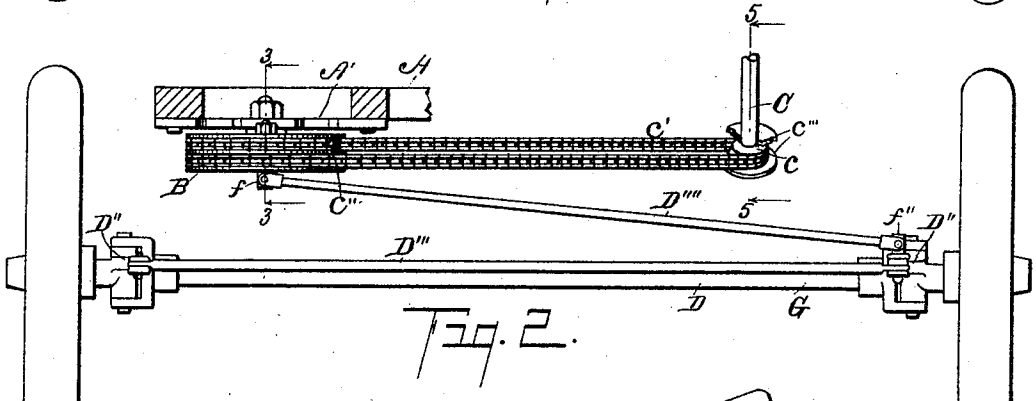


Fig. 2.

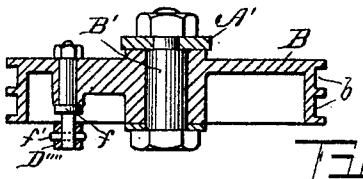


Fig. 3.

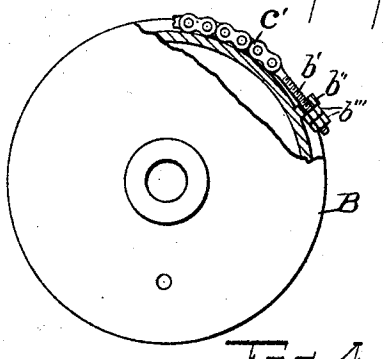


Fig. 4.

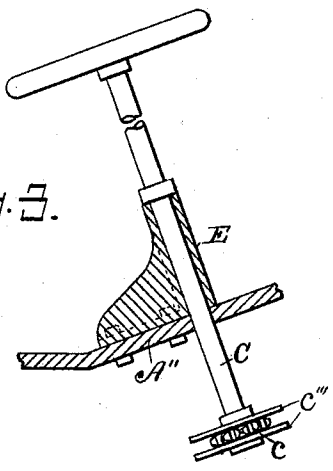


Fig. 5.

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No. 794,716. Patented July 18, 1905.

UNITED STATES PATENT OFFICE.

JAMES E. KIMBLE, OF VICKSBURG, MICHIGAN.

STEERING-GEAR FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 794,716, dated July 18, 1905.

Application filed September 12, 1904. Serial No. 224,202.

To all whom it may concern:

Be it known that I, JAMES E. KIMBLE, a citizen of the United States, residing at the city of Vicksburg, county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Steering-Gear for Motor-Vehicles, of which the following is a specification.

This invention relates to improvements in steering-gear for motor-vehicles.

The objects of this invention are, first, to provide an improved steering-gear for motor-vehicles in which there is practically no lost motion; second, to provide an improved steering-gear for motor-vehicles which may be quickly and easily adjusted to keep the parts in their proper relation; third, to provide an improved steering-gear for motor-vehicles in which the parts are so arranged that the strain thereon when in use is reduced to a minimum; fourth, to provide an improved steering-gear for motor-vehicles which may be easily applied to various constructions of vehicles without materially modifying the same.

Further objects and objects relating to structural details will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detail plan view of a structure embodying the features of my invention. Fig. 2 is a detail elevation view of the structure appearing in Fig. 1, portions of the frame of the vehicle-body being shown in sections. Fig. 3 is an enlarged sectional view through the drum or wheel B, taken on a line corresponding to line 3 3 of Fig. 1. Fig. 4 is an enlarged detail plan view of the drum or wheel B removed from the frame, portions being broken away to show the manner of connecting one end of the steering-chain c' thereto. Fig. 5 is an enlarged detail sectional view taken on a line corresponding to line 5 5 of Fig. 2, showing the arrangement of the steering-rod and the bearing therefor.

In the drawings the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, A represents the frame of a vehicle-body. Secured to the under side of this frame is a plate A'. This plate A' serves as a support for the drum or wheel B, which is secured thereto by the bolt B', which is provided with an enlarged portion adapted to form a journal for the drum B.

On the lower end of the steering-rod C is a sprocket-wheel c. This sprocket-wheel is connected to the drum or wheel B by the sprocket-chain c'. The drum B is provided with two peripheral grooves b to receive the ends of the chain c'. One end of the chain c' is connected to the drum at c'' in one of the grooves b and the other end is arranged in the other groove b and is adjustably secured by means of the eyebolt b' on the end thereof which is arranged through an outwardly-projecting lug b''. Nuts b''', one of which is a lock-nut, are provided for the bolt b'. By means of this connection the tension of the chain c' can be regulated as desired.

To positively retain the chain c' upon the sprocket-wheel, I provide the same with retaining-flanges c'''. In practice I do not find this necessary; but by using the flanges the chain would be retained even though the parts might spring or otherwise loosen under severe strain.

The wheel-spindles D' are pivoted to the axles D. These pivot connections may be of the usual or any desired style. The wheel-spindles D' are provided with rearwardly-projecting arms D'', which are connected by a link D'''.

The drum or wheel B is connected to one of the arms D'' by the connecting-rod D''''. The rod D'''' is connected to the wheel by means of the pitman-pin f, to which it is pivotally secured by means of a transversely-arranged pin f'. The rod D'''' is pivotally connected to an upwardly-projecting lug f'' on one of the spindle-arms D''. Thus connected the

movement of the vehicle-body frame upon its supporting-springs does not put any strain upon the steering connections, and this is also true of the movement of the running-gear caused by passing over obstructions or the like.

The steering-rod C is supported in a suitable bracket E, having a comparatively long bearing therein. This bracket E is mounted on the floor A″ of the vehicle. The bearing E for the steering-rod C is arranged in an inclined position to bring the hand-wheel of the steering-rod into convenient reach of the driver. As the ends of the chain *c′* are arranged in the peripheral grooves of the drum B one above the other, the steering-chain readily adapts itself to the inclined position of the sprocket-wheel *c* on the steering-rod without any undue strain being placed thereon.

With the parts arranged as I have illustrated and described I am enabled to accurately adjust the tension of the steering-chain so that there is no lost motion, and should the parts become loosened by wear or the stretching of the chain or the like the same may be quickly adjusted.

My improved steering-gear is, owing to the arrangement of the parts, very durable, as they are so arranged that the strain thereon is reduced to a minimum when in use. It also is of advantage in that it may be easily applied to structures not specially constructed therefor.

I have illustrated and described my improved steering-gear for motor-vehicles in the form preferred by me on account of its structural simplicity and economy, although I am aware that it may be considerably modified in structural details without departing from my invention.

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

1. In a steering-gear, the combination with a vehicle-body of a drum or wheel, having a pair of peripheral grooves; an axle having pivoted wheel-spindles, said spindles having laterally-projecting arms; a connecting-link for said arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a sprocket-wheel therefor; a chain for connecting said sprocket-wheel and said drum, having its ends arranged in the grooves of said drum and secured thereto; an eyebolt on one end of said connecting-chain; an outwardly-projecting lug on said wheel or drum through which said eyebolt is arranged; and a nut for said eyebolt, for the purpose specified.

2. In a steering-gear, the combination with a vehicle-body of a drum or wheel, having a pair of peripheral grooves; an axle having pivoted wheel-spindles, said spindles having laterally-projecting arms; a connecting-link for said arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a sprocket-wheel therefor; a chain for connecting said sprocket-wheel and said drum, having its ends arranged in the grooves of said drum; and means for adjustably securing one end of said chain to said drum, for the purpose specified.

3. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle having pivoted wheel-spindles, said spindles having laterally-projecting arms; a connecting-link for said arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a sprocket-wheel therefor; a chain for connecting said sprocket-wheel and said drum, for the purpose specified.

4. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle having pivoted wheel-spindles, said spindles having laterally-projecting arms; a connecting-link for said arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a sprocket-wheel therefor; a chain for connecting said sprocket-wheel and said drum; and means for adjustably securing one end of said chain to said drum, for the purpose specified.

5. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle having pivoted wheel-spindles, said wheel-spindles having laterally-projecting arms; a connecting-link for said wheel-spindle arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms and to said drum; a steering-rod; a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum; and an adjustable connection for one end of said chain to said drum, for the purpose specified.

6. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle having pivoted wheel-spindles, said wheel-spindles having laterally-projecting arms; a connecting-link for said wheel-spindle arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms and to said drum; a steering-rod; a chain for connecting said steering-rod and said drum; and an adjustable connection for

one end of said chain to said drum, for the purpose specified.

7. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle having pivoted wheel-spindles, said wheel-spindles having laterally-projecting arms; a connecting-link for said wheel-spindle arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms and to said drum; a steering-rod; and a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum, for the purpose specified.

8. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle having pivoted wheel-spindles, said wheel-spindles having laterally-projecting arms; a connecting-link for said wheel-spindle arms; a connecting-rod having a pivotal connection to one of said wheel-spindle arms and to said drum; a steering-rod; and a chain for connecting said steering-rod and said drum, for the purpose specified.

9. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle; a connecting-rod having a pivotal connection to said axle; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum; and an adjustable connection for one end of said chain to said drum, for the purpose specified.

10. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a chain for connecting said steering-rod and said drum; and an adjustable connection for one end of said chain to said drum, for the purpose specified.

11. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle; a connecting-rod having a pivotal connection to said axle; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum; and means for adjusting said chain, for the purpose specified.

12. In a steering-gear, the combination with a vehicle-body, of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; a chain for connecting said steering-rod and said drum; and means for adjusting said chain, for the purpose specified.

13. In a steering-gear, the combination with a vehicle-body, of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum; and an adjustable connection for one end of said chain to said drum, for the purpose specified.

14. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; a chain for connecting said steering-rod and said drum; and an adjustable connection for one end of said chain to said drum, for the purpose specified.

15. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum; and means for adjusting said chain, for the purpose specified.

16. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; a chain for connecting said steering-rod and said drum; and means for adjusting said chain, for the purpose specified.

17. In a steering-gear, the combination with a vehicle-body, of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; and a chain for connecting said steering-rod and said drum, having its ends arranged in the grooves of said drum, for the purpose specified.

18. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; and a chain for connecting said steering-rod and said drum, for the purpose specified.

19. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; suitable connections for said

steering-rod and drum; and means for adjusting the same, for the purpose specified.

20. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle; a crank-pin arranged in a suitable bearing in said wheel or drum, to which said connecting-rod is secured by a transversely-arranged pivot; a steering-rod; and suitable connections for said steering-rod and drum, for the purpose specified.

21. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; suitable connections for said steering-rod and drum; and means for adjusting the same, for the purpose specified.

22. In a steering-gear, the combination with a vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; and suitable connections for said steering-rod and drum, for the purpose specified.

23. In a steering-gear, the combination with the vehicle-body of a drum or wheel carried thereby, having a pair of peripheral grooves; an axle; a connecting-rod having a pivoted connection to said axle and to said drum; a steering-rod; a sprocket-wheel thereon; chain-retaining flanges for said sprocket-wheel; a chain for connecting said sprocket to said drum having its ends arranged in the grooves of said drum; and means for adjusting said chain, for the purpose specified.

24. In a steering-gear, the combination with the vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; a sprocket-wheel therefor; chain-retaining flanges for said sprocket-wheel; a chain for connecting said sprocket-wheel to said drum; and means for adjusting said chain, for the purpose specified.

25. In a steering-gear, the combination with the vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum; a steering-rod; a sprocket-wheel therefor; chain-retaining flanges for said sprocket-wheel; and a chain for connecting said sprocket-wheel to said drum, for the purpose specified.

26. In a steering-gear, the combination with the vehicle-body of a drum or wheel carried thereby; an axle; a connecting-rod having a pivotal connection to said axle and to said drum or wheel; a steering-rod; a sprocket-wheel thereon; chain-retaining flanges for said sprocket-wheel; and a connecting-chain to said wheel, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

JAMES E. KIMBLE. [L. S.]

Witnesses:

ADELAIDE T. ADAMS,

OTIS A. EARL.