No. 684,265. Patented Oct. 8, 1901.

H. T. KINGSBURY.

MOTOR CARRIAGE RUNNING GEAR.

(Application filed Apr. 11, 1901.)

(No Model.) 2 Sheets—Sheet 1

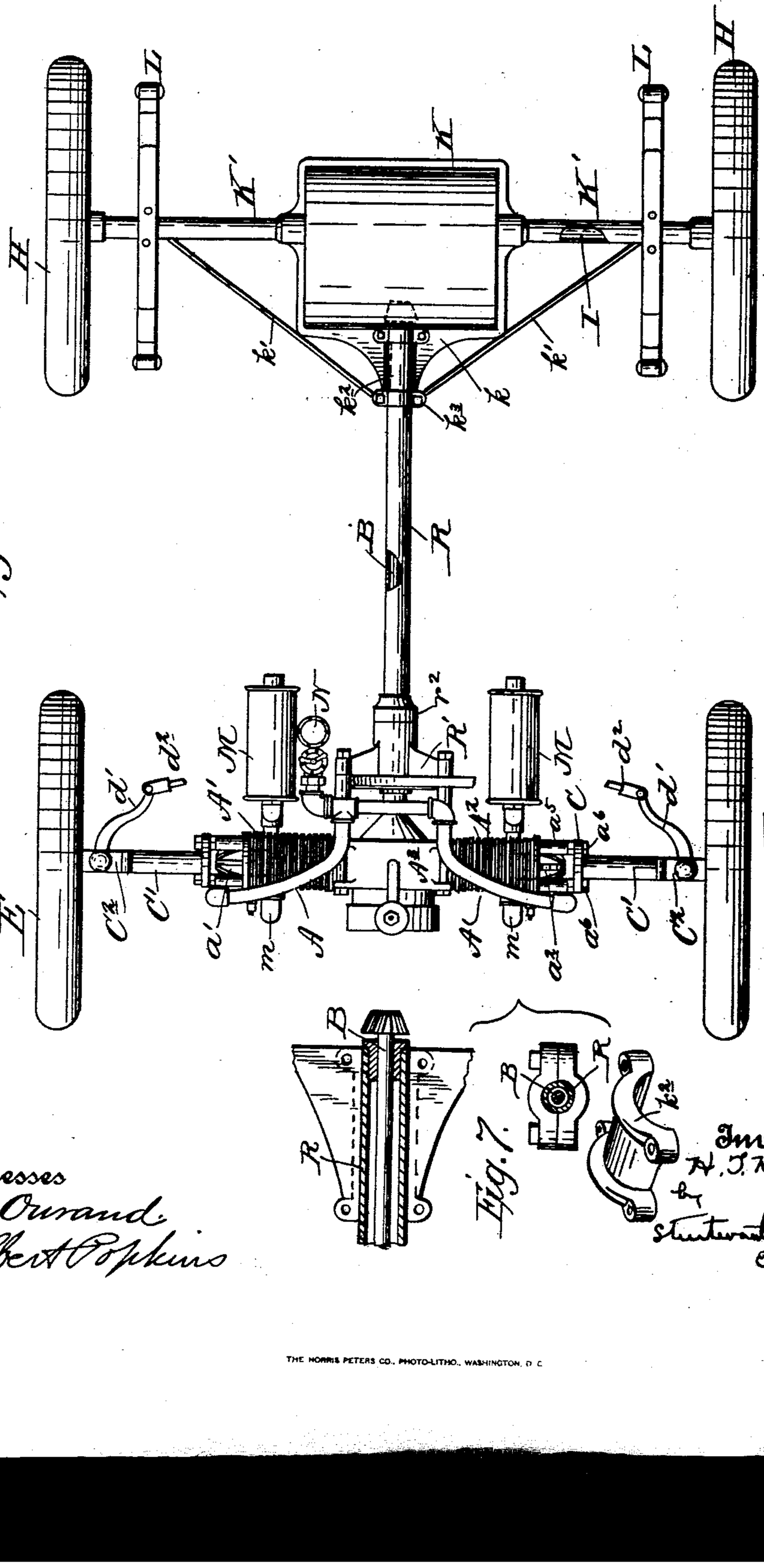

Fig. 1.

Fig. 7.

Witnesses
F. L. Ourand.
Albert Popkins

Inventor
H. T. Kingsbury
by
Stewart & Prueley
Attorneys.

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Fig. 5.

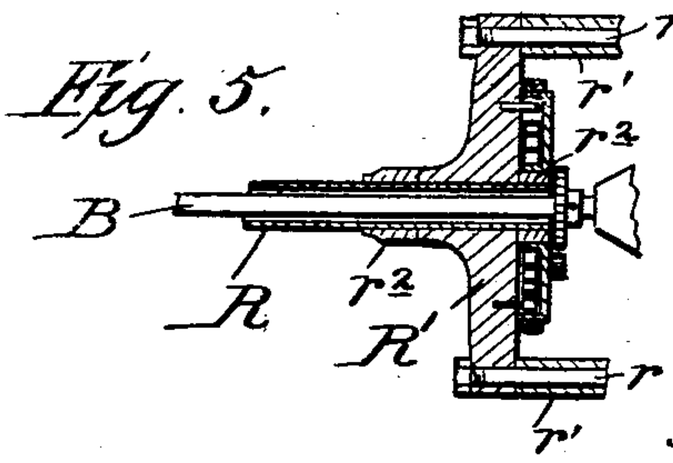


Fig. 4.

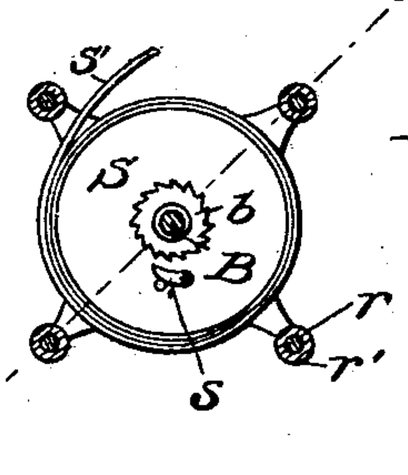


Fig. 2.

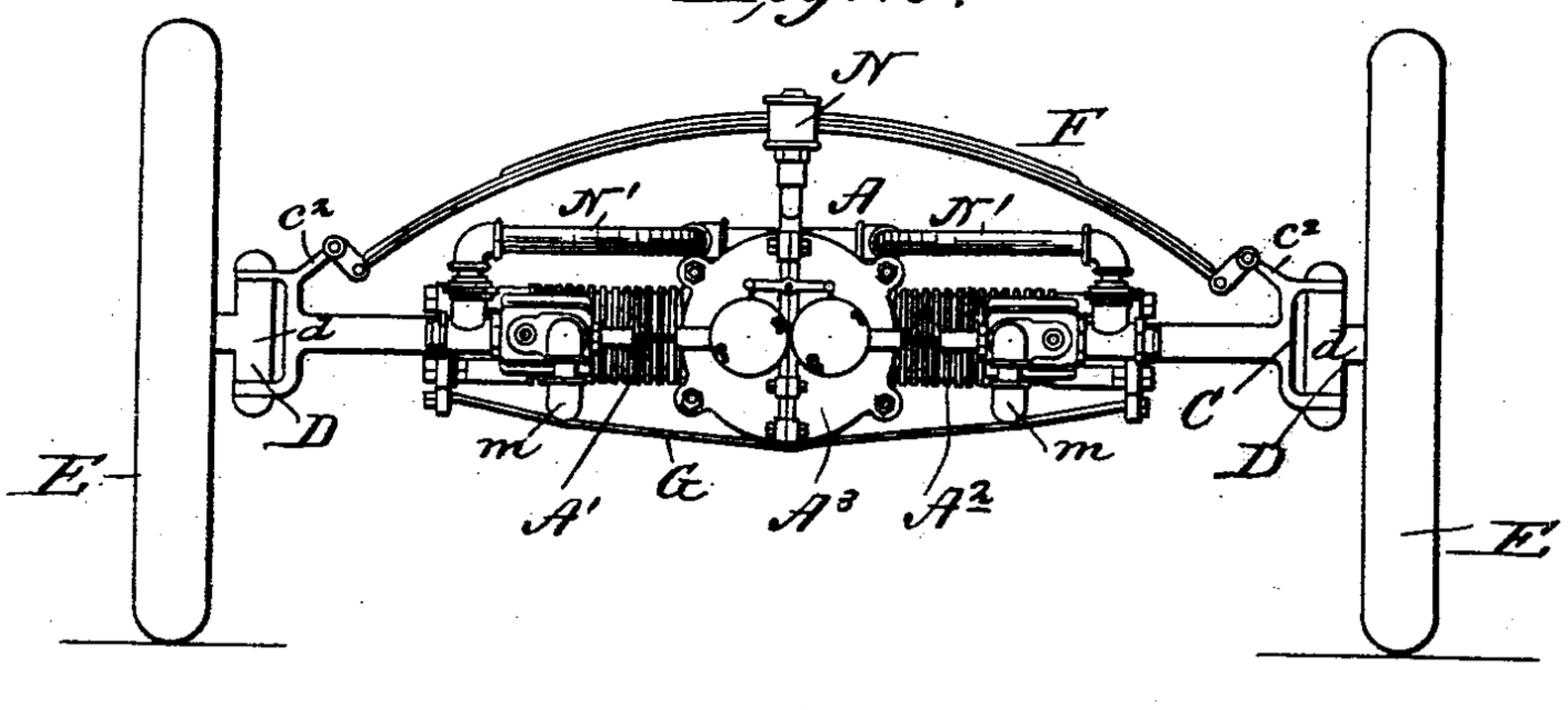


Fig. 3

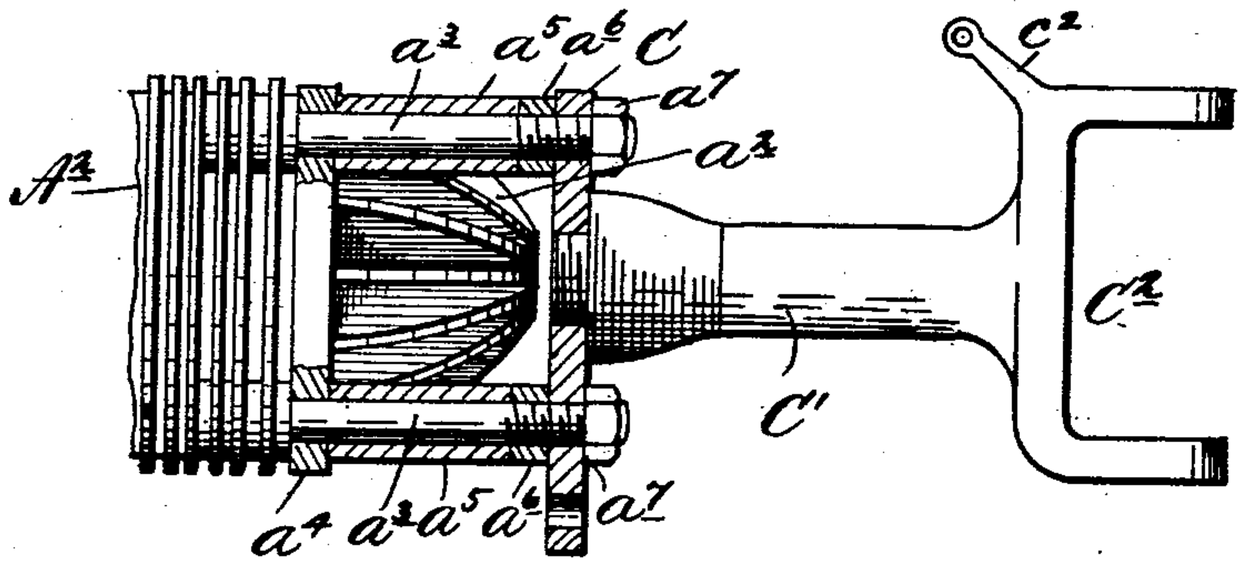
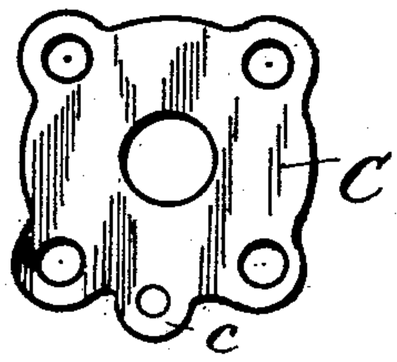


Fig. 6.



Witnesses
F. L. Ourand.
Albert Copeland

Inventor
H. T. Kingsbury
by
Sturtevant & Greeley
Attorneys.

UNITED STATES PATENT OFFICE.

HARRY THAYER KINGSBURY, OF KEENE, NEW HAMPSHIRE.

MOTOR-CARRIAGE RUNNING-GEAR.

SPECIFICATION forming part of Letters Patent No. 684,265, dated October 8, 1901.

Application filed April 11, 1901. Serial No. 55,329. (No model.)

To all whom it may concern:

Be it known that I, HARRY THAYER KINGSBURY, a citizen of the United States, residing at Keene, in the county of Cheshire, State of New Hampshire, have invented certain new and useful Improvements in Motor-Carriage Running-Gear, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to running-gear designed especially for motor-vehicles.

The main objects of the invention are to provide a running-gear in which the longitudinally-alined cylinders of a transversely-placed double-cylinder air-cooled gasolene-engine are made to form a part of one of the axles, to provide a running-gear in which the central tubular reach through which passes the main drive-shaft is swiveled to the front and rear axles to allow them to rise in passing obstructions without torsionally straining the reach, and to provide an improved starting device. These objects I accomplish by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a plan of my improved running-gear. Fig. 2 is a front elevation thereof. Fig. 3 is an enlarged detail view of one end of an engine-cylinder and its attached axle-fork. Fig. 4 is an elevation of the starting-drum. Fig. 5 is a central vertical section on line 5 5, Fig. 4. Fig. 6 is a detail of one of the fork-carrying plates. Fig. 7 shows details of the connection between the rear end of the reach and the rear gear-box.

A designates the transversely-arranged double-cylinder air-cooled gasolene-engine, having its longitudinally-alined cylinders A' A^2 separated by the usual crank-chamber A^3, in which work the cranks (not shown) operated by the inner ends of the piston-rods (not shown) and serving to impart rotary motion to the longitudinal drive-shaft B in any suitable manner. I have not shown the internal mechanism of the engine nor its ignition devices, as these form no part of the invention. The heads a' a^2 of the two cylinders are usually secured in place by short cap-screws; but in lieu of these I provide the cylinder ends with long bolts or studs a^3, which pass through apertures in the flanges a^4 of said heads and extend outwardly beyond the outer ends of the heads. On these bolts I place the thimbles or tubes a^5, which are held in place on the bolts by means of the nuts a^6, which also hold the cylinder-heads in place.

C C are the fork-carrying plates, held on the outer ends of the bolts a^3 by the nuts a^7, as shown best in Fig. 3.

From the center of each plate C projects outwardly the axle member or arm C′, which may be integral or otherwise connected therewith, and the outer ends of these axle members or arms C′ are each provided with a fork C^2, the upper and lower members of which project- horizontally and receive between them the vertical members d of the stub-axles D, as shown in Fig. 2. These stub-axles D are provided, as usual, with the rearwardly and inwardly curved arms d', to which the steering-rods d^2 are connected for operation in the usual manner to turn the steering-wheels E E, mounted on the stub-axles. The upper corner of each fork C^2 is provided with an inwardly and upwardly inclined arm c^2, to which the ends of the forward body-supporting spring F are shackled.

G is a truss-rod secured at its ends to apertured ears c on the lower edges of the plate C^2, said truss at its middle passing under the crank-box A^3, which projects down somewhat below the cylinders and so serves as the strut or bolster for the truss.

H H designate the drive-wheels of the vehicle mounted on the two-part rear axle I I, at the inner ends of which is the gear-box K, containing compensating gearing (not shown) for driving the axle I I and the wheels H H from the rear end of the main drive-shaft B.

The gear-box K is provided with two long sleeves K′ K′, in which turns the two-part rear axle I I. The sleeves K′ K′ also support the rear elliptical body-supporting springs L L.

R is the tubular reach through which the drive-shaft B passes, as shown in Figs. 1 and 5. The front end of the reach swivels in a spider-like bearing R′, bolted to the rear side of the crank-box A^3 by means of the four bolts $r r r r$, which are provided with spacing-thimbles r' to properly space the bearing R′ from the said crank-box. The reach R is held in swiveled connection with the bearing R′ by means of two collars r^2 r^2, one at each side

thereof, (see Fig. 5,) which hold said reach from endwise movement.

The rear end of the tubular reach R is clamped in the forwardly-projecting extension *k* of the gear-box K by the cap k^2 and screws k^3 k^3, and this end *k* of said box is braced from the sleeves K′ by means of the rods *k*′. Thus when a rear wheel is raised the reach will turn in the bearing R′, and when a front wheel is raised the bearing R′ will turn on the reach, and so all torsional strain on the reach is obviated.

Referring again to the motor A, the mufflers M M are shown as in rear of the cylinders and connected with the exhausts in front of the cylinders by means of separate pipes *m m*, which extend therefrom downwardly and under the cylinders to the mufflers.

N is a constant-level carbureter in rear of the cylinders and supplied with gasolene from a reservoir, which will be mounted on the vehicle-body. (Not shown.) This carbureter N is connected by the branch pipes N′ N′ with the cylinders in the usual manner to supply the same with the explosive vapor or gas.

In order to start the engine, the main shaft B is provided behind the bearing R′ with a ratchet-wheel *b*, (see Figs. 4 and 5,) and on the collar r^2 rotates a spring-drum S, provided below the ratchet with a gravity-pawl *s*, adapted to drop into engagement with the ratchet when the drum is rotated by its strap *s*′, the latter being in practice extended up within reach of the operator. The drum-spring s^2 will return the drum S to normal position, which is that shown in Fig. 4, whereupon the pawl *s* will drop out of engagement with the ratchet *b*. It will be seen, therefore, that the starting mechanism is normally disconnected from the drive-shaft B, so that there is no bearing thereat requiring lubricating, as is the case where the drum is on the drive-shaft.

If desired, the engine or motor may be built into and form the middle section of the rear axle instead of the front axle, as now shown.

The advantages of my improved running-gear are as follows:

First. It places the motor in the best possible position for the circulation of air to cool the cylinders.

Second. It permits setting the vehicle-body very low, so that there is little danger of overturning.

Third. The vibration of the engine is not imparted to the gears, thus insuring quieter running and longer life, and, moreover, the vibrations are not transmitted to the vehicle-body.

Fifth. The dead-weight is evenly distributed on the wheel-tires, and, lastly, the construction may be lighter, as the engine or motor forms part of the axle and does not require separate supports.

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

1. In a motor-vehicle running-gear, an engine provided at its ends with axle-forming members and constituting the middle section of an axle, and stub-axles pivotally connected to said members and adapted for connection with a steering device; substantially as described.

2. In a motor-vehicle running-gear, a double-cylinder engine or motor having its cylinders in longitudinal alinement and forming the middle axially-coincident member of one of the axles, in combination with a central longitudinal drive-shaft driven from said motor or engine and at its opposite end geared to the other axle; substantially as described.

3. A motor-vehicle running-gear comprising a transversely-arranged double-cylinder engine, axle members projecting from the opposite ends of the two cylinders, of a central tubular reach connected to the rear of the engine at the middle thereof, and at its opposite end connected with the driven axle and a longitudinal drive-shaft extending through the said tubular reach and driving the driven axle from said engine; substantially as described.

4. A motor-vehicle running-gear, comprising a double-cylinder engine having axle members projecting from the cylinder ends, a central bearing secured to the rear side of the engine-crank box, the rear gear-box having axle-supporting sleeves, the central longitudinal tubular reach swiveled at one end in said central bearing and at its other end secured to the gear-box, a two-part axle mounted in said sleeves and a drive-shaft extending from the crank-box through the tubular reach into the gear-box to drive the two-part axle; substantially as described.

5. A motor-vehicle running-gear, comprising a double-cylinder engine having axle members projecting from the cylinder ends, stub-axles pivotally mounted on the outer ends of the said axle members and adapted for connection with the steering devices, a rear gear-box having axle-supporting sleeves, a two-part axle mounted in said sleeves, a central bearing on the rear face of the engine-crank box, a tubular reach swiveled in said bearing and connected at its opposite end with the said gear-box, and a drive-shaft extending from the crank-box, through said tubular reach into the gear-box for driving the two-part axle from the engine; substantially as described.

6. The combination with the front and rear axles, and a longitudinally-extending central swiveled reach connecting said axles, of an engine forming the middle section of one of said axles, and a drive-shaft operated from said engine, extending through the reach and geared to the other axle; substantially as described.

7. In a motor-vehicle running-gear, a double-cylinder engine having a plurality of bolts projecting longitudinally from its ends, the cylinder-heads mounted on said bolts, spac-

ing sleeves and nuts holding the heads in place, plates mounted on the outer ends of the bolts and provided with axle members, and nuts securing the plates on the bolts; substantially as described.

8. In a motor-vehicle running-gear, a double-cylinder engine provided at its ends with axle-forming members forked at their outer ends to receive stub-axles, arms projecting from the upper ends of the forks and a bow-spring shackled at its ends to said arms; substantially as described.

9. In a motor-vehicle running-gear, a double-cylinder engine provided at its ends with plates having axles forming members, and a truss-rod secured at its ends to the lower edges of said plates and extending longitudinally under the engine; substantially as described.

10. In a motor-vehicle running-gear, a double-cylinder gas-engine having axially coincident axle members on its ends, mufflers in rear of the cylinders, pipes leading from the exhausts in front of the cylinders rearwardly under the cylinders to the mufflers, a carbureter also in rear of the cylinders and branch pipes leading therefrom in opposite directions to the cylinders; substantially as described.

11. The combination in a motor-vehicle with the double-cylinder engine, the bearing in rear of its crank-box and the tubular reach swiveled in said bearing, and the drive-shaft extending from the crank-box through said reach, of a ratchet on the said drive-shaft, a spring-drum turning on the reach and provided with a gravity-pawl below and normally out of engagement with said ratchet, and a strap wound on the drum for rotating it to throw the pawl into engagement with the ratchet and rotate the said shaft in starting the engine; substantially as described.

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

HARRY THAYER KINGSBURY.

Witnesses:
L. G. LITCHFIELD,
C. L. STURTEVANT.