No. 810,636. PATENTED JAN. 23, 1906.

L. B. GAYLOR.

AUTOMOBILE.

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Fig. 1.

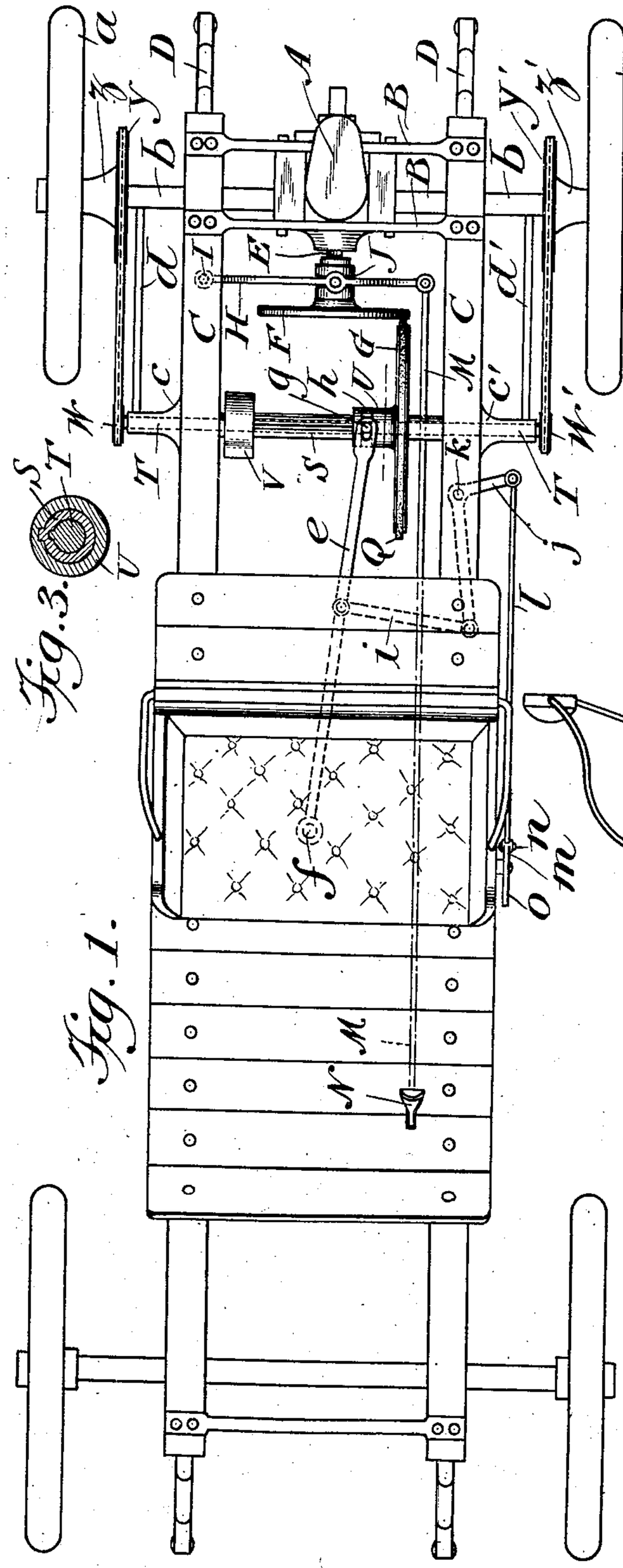

Fig. 2.

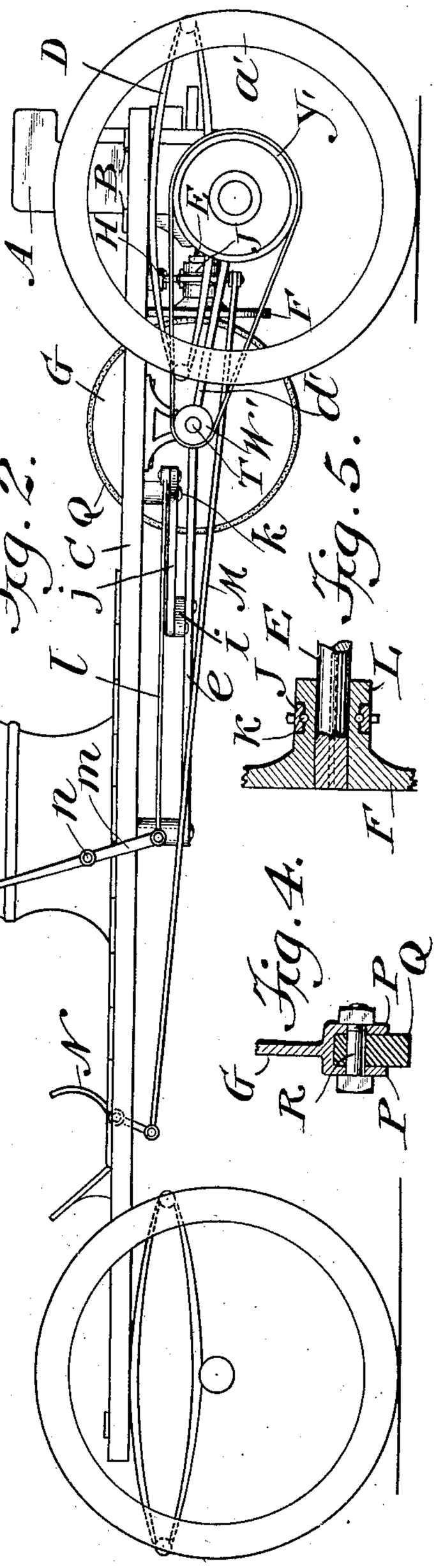

Fig. 3.

Fig. 4.

Fig. 5.

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AUTOMOBILE.

No. 810,636. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed March 21, 1905. Serial No. 251,238.

To all whom it may concern.

Be it known that I, LEONARD B. GAYLOR, a citizen of the United States, and a resident of the city of Newton Center, county of Middlesex, State of Massachusetts, have invented a new and useful Improvement in Automobiles, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 illustrates a plan view of a so-called "buckboard" automobile embodying my invention. Fig. 2 illustrates an elevation of that which is shown in Fig. 1. Fig. 3 illustrates a detail of portions of the driving mechanism. Fig. 4 illustrates a detail of the construction of the edge of the driving-wheel. Fig. 5 illustrates a detail of a portion of the power-transmitting mechanism.

In the drawings hereof I show my invention as embodied in the well-known buckboard form of automobile-runabout as an example only of a light machine to which the invention is well adapted. Obviously it can be used in conjunction with machines of a variety of constructions. In the drawings, also, I do not show many parts usual in such constructions. They are omitted because they have no bearing upon the present invention and that the drawings may be simplified as much as possible.

My invention relates to improved driving mechanism for light automobiles.

It consists in the special construction and arrangement of the parts, as hereinafter described.

A represents any suitable motor. In the case shown it is bolted to cross-braces B B, which are secured to the flexible side bars C C of the frame of the buckboard, which in turn rest on suitable springs D D. Elliptical springs are shown in the present instance. The motor-shaft E has upon its forward end a friction-disk F, which is adapted to a forward-and-backward movement of about one-half an inch on the shaft, it being splined thereto for this purpose. The friction-disk F engages with the friction driving-wheel G when the former is slid forwardly upon the motor-shaft E, thus driving the machine. When, on the other hand, it is retracted or slid backwardly upon the motor-shaft, then the motor runs idle.

The means for moving the disk F forwardly and rearwardly are or may be as follows: A lever H is pivoted at I to some suitable fixed point. It engages with a collar J, (see Fig. 5,) which preferably has a ball-bearing connection K with the hub L of the friction-disk F. M is a rod which projects forwardly under the platform of the buckboard and engages with a pedal-lever N, pivoted at O to the frame of the machine. This pedal-lever N may be provided with a rack and pawl (not shown) to maintain the pressure of the disk against the driving-wheel. The driving-wheel G may advantageously have its edge faced with leather, fiber, or other suitable friction-generating material, which is preferably confined between flanges on the edge of the friction driving-wheel, as shown in Fig. 4—that is to say, the edge of the driving-wheel is flanged or bifurcated at P P and the friction-generating material Q is set between the bifurcations and fastened in place by cross-bolts R or by other suitable means. The friction-surface projects somewhat beyond the outer edges of the flanges, so that they may not come in contact with the friction-disk F. Obviously the friction-generating material may, if preferred, be attached to the face of the disk F, in which case the edge of the driving-wheel will present a metallic surface. The driving-wheel G is mounted upon a tubular shaft S, through which passes a solid shaft T, the two being splined together, as shown in Fig. 3. U is the hub of the driving-wheel. It is splined, as shown in Fig. 3, to the hollow shaft S. V is a casing in which the differential gear, which may be of any suitable construction, is inclosed. W W′ are two sprocket-wheels mounted on the ends of the solid shaft T, which ends are preferably squared for the more secure retention of the sprocket-wheels. Y Y′ are two other sprocket-wheels bolted or otherwise attached to the hubs Z Z′ of the rear or driven wheels *a a′*, which revolve upon the fixed rear shaft *b*. The sprocket-wheels W, W′, Y, and Y′ are connected by the usual sprocket-chains, as shown. *c c′* are two bearings fastened to some suitable part of the frame, as shown, which support the outer ends of the solid shaft T and are braced against the fixed rear shaft *b* by suitable brace-rods *d d′*. In order that the driving-wheel G may be moved toward and from the center of the friction-disk F, thus increasing or decreasing the speed of the machine, and also that it may be carried beyond the center of the friction-disk, thus reversing the machine, it is splined to the hollow shaft S. The mechanism for so moving the driving-wheel on the hollow shaft

S is as follows: A lever *e* beneath the machine is pivoted at *f* to some fixed part of the structure and at *g* engages with an ordinary power-transmitting collar *h* on the hub U of the driving-wheel. A link *i* engages, as shown, with the lever *e* and also with one end of a bell-crank *j*, which is pivoted at *k* to some fixed part of the machine. *l* is a rod pivoted to the other end of the bell-crank *j*, which extends forwardly and is pivotally connected with a lever *m* at *n* to some fixed part of the machine. The upper end *o* of this lever is within easy reach of the hand of the chauffeur.

From the foregoing the operation is obvious. When the motor is in action, its shaft E continually rotates the friction-disk F. When it is desired to propel the machine, the chauffeur or operator, through the instrumentality of the pedal-lever N and its associated parts, moves the friction-disk F forwardly, sliding it upon the motor-shaft E until it engages with the friction edge Q of the driving-wheel G. The position of the edge of this wheel relative to the axis of the friction-disk will determine the speed with which the machine will be driven. If near the outer edge, the motion will be rapid. As it approaches the center the speed will be reduced and as it crosses the center and engages with the opposite side of the friction-disk F the movement of the machine will be reversed.

The means by which the driving-wheel G may be shifted longitudinally on the shaft S through the instrumentality of the hand-lever *o m* has been already explained. The ball-bearings *k*, which I prefer to incorporate as part of the collar *j*, reduce the friction and consequent consumption of power at this part of the apparatus.

I am aware that it is not new to drive mechanisms of this character by means of friction-gearing, nor is it new to regulate the speed of such mechanism by moving a driving-wheel toward and from the center of a friction-disk; but it is new to construct and arrange the parts specified by me in the manner shown, and therefrom flow the following important advantages in a vehicle such as contemplated by me—that is to say, the motor is spring-supported over the axle at which its power is to be exerted, so that the expensive and elaborate construction necessary when the motor is placed at the other end of the machine is avoided; also, for small and necessarily inexpensiveness cars, like the well-known buckboard, my construction embodies various features, whereby the cost, weight, and number of parts is materially reduced; also, the motor is raised well above the ground out of the dust and mud, which is a great desideratum in such small and relatively low automobiles; also; the throwing of the motor out of gear is effected in a most effective, easy, and simple manner, there being no complicated planetary gearing or other involved mechanism necessary; also, the weight and momentum of the friction-disk and driving-wheel act in the nature of fly-wheels to maintain smooth steady running of the machine over obstructions, such as short stretches of mud or sand, which would otherwise tend to slow down the machine, because of its light weight; also; the noise of pinion-gearing, which is particularly noticeable on the buckboard as heretofore constructed, is entirely eliminated, because of the practically silent action of the friction-disk and driving-wheel, the noise made by the transmission-chains being comparatively slight; lastly, the unlimited number of speeds forward and also backward give the machine the smoothest possible action.

This invention is intended especially for application to the well-known buckboard form of automobile heretofore invented, patented, and largely manufactured by me, although I by no means limit myself to such application.

The advantages of the invention, however, when applied to the buckboard-automobile will be more fully appreciated from the following: In the buckboard-automobile as heretofore constructed the motor has been carried by a frame which is rigidly supported upon the driven shaft, with the result that the weight of the motor, shaft, and driving-wheel as a dead weight takes every inequality in the road-surface, whereby violent tremulous or jarring impulses are transmitted to the seat of the rider, and the machine is thus rendered uncomfortable to many persons and objectionable to all. Moreover, heretofore the power has been transmitted from the motor to the driven axle through planetary gearing, the noise of which has been extremely disagreeable. Under this present invention it will be noted that the motor is elastically or yieldingly supported from the main reaches or side bars of the buckboard-platfrom, which in turn are directly over the rear axle, springs, however, being interposed between said reaches and the axle. The power is carried from the motor forward to a counter-shaft, near which the friction-surfaces engage, and from the sprockets upon this counter-shaft the power is returned to the driven wheels which are upon the rear axle, which of course is fixed. It will be noted also that the friction mechanism, although forward of the motor, is close to it, so that it does not partake materially of the springing action of the flexible platform. This is an advantageous feature, because the weight of the counter-shaft and coacting parts being so near the point of support does not materially depress or weigh down the flexible platform.

From this construction and arrangement a series of very advantageous results follow.

First. All of the weighty metallic parts, in-

cluding the motor, are superposed directly upon or clustered about the axle which supports the driven wheels. Hence the traction is increased, and this is desirable in so light a vehicle as the buckboard.

Second. Inequalities in the road-surface are all neutralized by the interposition of the springs between the motor and the driving-wheels, which encounter them.

Third. All gears of every kind are eliminated, friction mechanism being substituted therefor, and the sprockets are practically noiseless in use.

Heretofore, so far as I am aware, automobile-motors have been supported either directly upon the driven rear shaft, as in the former construction of the buckboard, or upon the forward end of the frame of the vehicle, with suitable power-transmitting devices extending thence rearwardly to the driven wheels, or in some instances upon the main frame or chassis underneath the body. Either of these constructions are impracticable in an automobile of the buckboard type, because if the motor be mounted in front it would be impractical to transmit the power to the rear, owing to the marked flexibility of the buckboard-platform, also the expense involved would so materially increase the cost of the buckboard as to render it unsaleable. Moreover, it is plainly evident that the motor and its coacting parts cannot be hung under the body of the buckboard, because there is no rigid platform to support them in such a vehicle, and if one were provided the expense and weight would again be prohibitive, because of the low price at which the buckboards must be sold, and if this mechanism were attached to the under side of the flexible body it would be impractical, because the platform would be inadequate to properly and safely support it. Hence the advantages above referred to of supporting the motor and coacting parts from the buckboard side bars so that they are substantially balanced over the rear axle with springs intervening become apparent.

It will be obvious to those who are familiar with this art that modifications may be made in the details of construction without departing from the essentials of the invention. I therefore do not limit myself to such details.

I claim—

1. In an automobile the combination of a motor mounted upon a spring-supported frame over a fixed rear axle, a counter-shaft forward of the motor, sprocket-wheels on the counter-shaft, sprocket-chains proceeding from said sprocket-wheels direct to each driven wheel independently and means for transmitting the power of the motor to the counter-shaft at variable speeds.

2. In an automobile the combination of a motor mounted upon a spring-supported frame over a fixed rear axle, a counter-shaft forward of the motor, sprocket-wheels upon the counter-shaft, driven wheels mounted loosely upon a fixed axle, sprocket-wheels on the hub of each driven wheel and sprocket-chains connecting the sprockets upon the counter-shaft with the sprockets upon the hubs of the wheels.

3. In an automobile the combination of a motor mounted upon a spring-supported frame over a fixed rear axle, a sliding friction-disk on the shaft of the motor, a counter-shaft forward of the motor having a driving-wheel thereon presented edgewise to the friction-disk and power-conveying devices such as chains for transmitting motion from the counter-shaft to each of the rear wheels.

4. In an automobile the combination of a motor mounted upon a spring-supported frame over a rear axle, a counter-shaft forward of the motor having fixed bearings, driven wheels mounted upon a rear axle, power-conveying devices, such as chains, connecting the counter-shaft direct with the driven wheels and means for transmitting the power of the motor to the counter-shaft at variable speeds.

5. In an automobile the combination of a motor, a sliding friction-disk on the shaft of the motor, a counter-shaft forward of the motor having a driving-wheel thereon presented edgewise to the friction-disk and means for moving the friction-disk and driving-wheel toward and from each other.

6. In an automobile the combination of a motor, a sliding friction-disk on the shaft of the motor, a counter-shaft forward of the motor having a driving-wheel thereon presented edgewise to the friction-disk, means for moving the friction-disk and driving-wheel toward and from each other and means to shift the driving-wheel across the face of the friction-disk.

7. In an automobile the combination of a motor mounted upon a spring-supported frame, a counter-shaft forward of the motor having fixed bearings, a sliding friction-disk on the shaft of the motor, driven wheels mounted upon a rear axle, power-conveying devices, such as chains, connecting the counter-shaft direct with the driven wheels and means for transmitting the power of the motor to the counter-shaft at variable speeds.

8. In an automobile the combination of a motor, a sliding friction-disk on the shaft of the motor, a counter-shaft forward of the motor having fixed bearings, a driving-wheel on the counter-shaft adapted to transverse movement relative to the friction-disk and means for transmitting the motion of the counter-shaft to the driven wheels.

9. In an automobile the combination of a motor, a sliding friction-disk on the shaft of the motor, a counter-shaft forward of the mo-

tor having fixed bearings, a driving-wheel on the counter-shaft adapted to transverse movement relative to the friction-disk and means for transmitting the motion of the counter-shaft to the driven wheels independently.

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

LEONARD B. GAYLOR.

Witnesses:
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HARRIET L. PARKER.