No. 773,575. PATENTED NOV. 1, 1904.

A. S. KROTZ.

AUTOMOBILE.

APPLICATION FILED FEB. 21, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

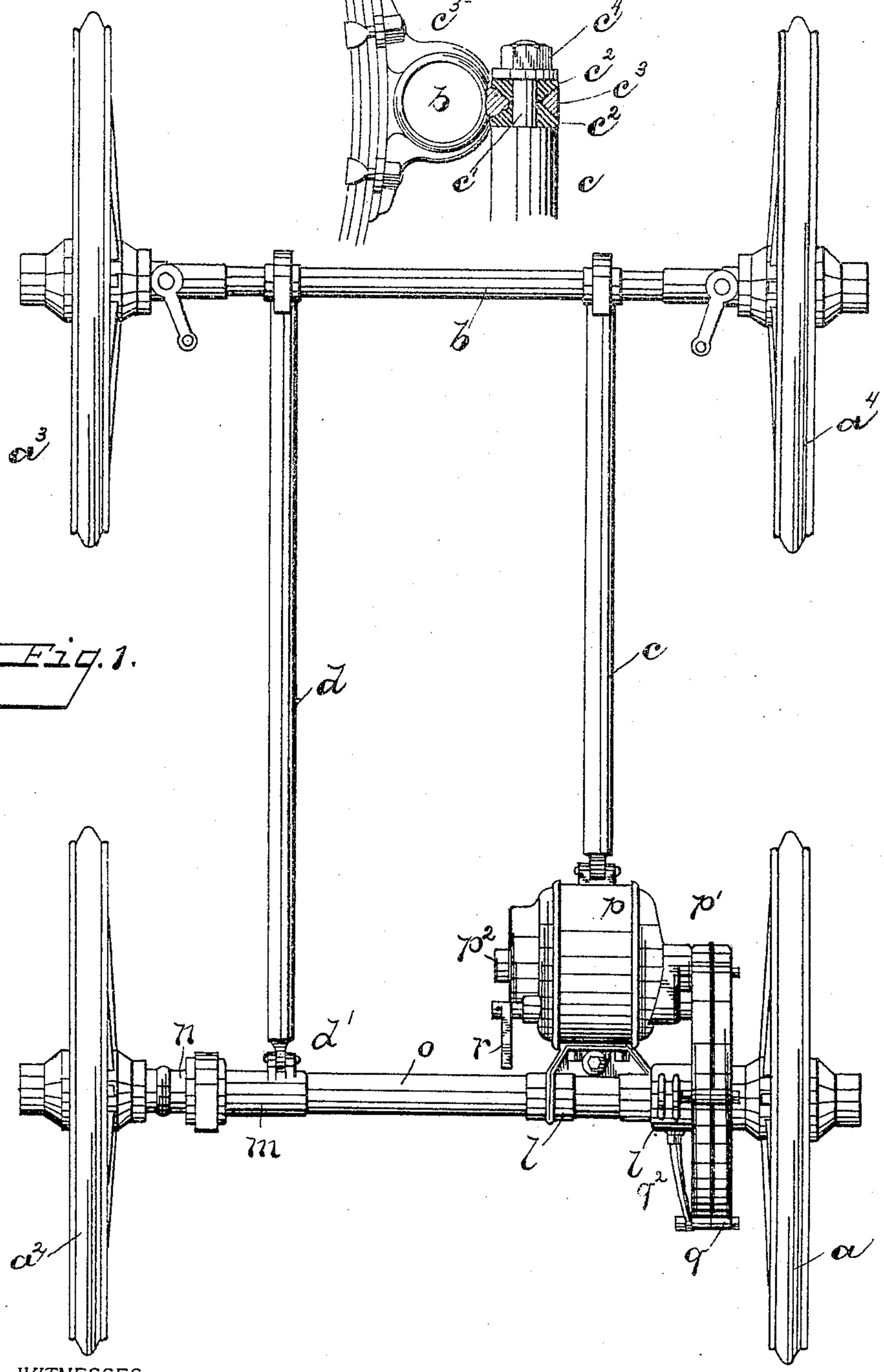

Fig. 5.

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BY Stanley and Bowman

ATTORNEYS

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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2

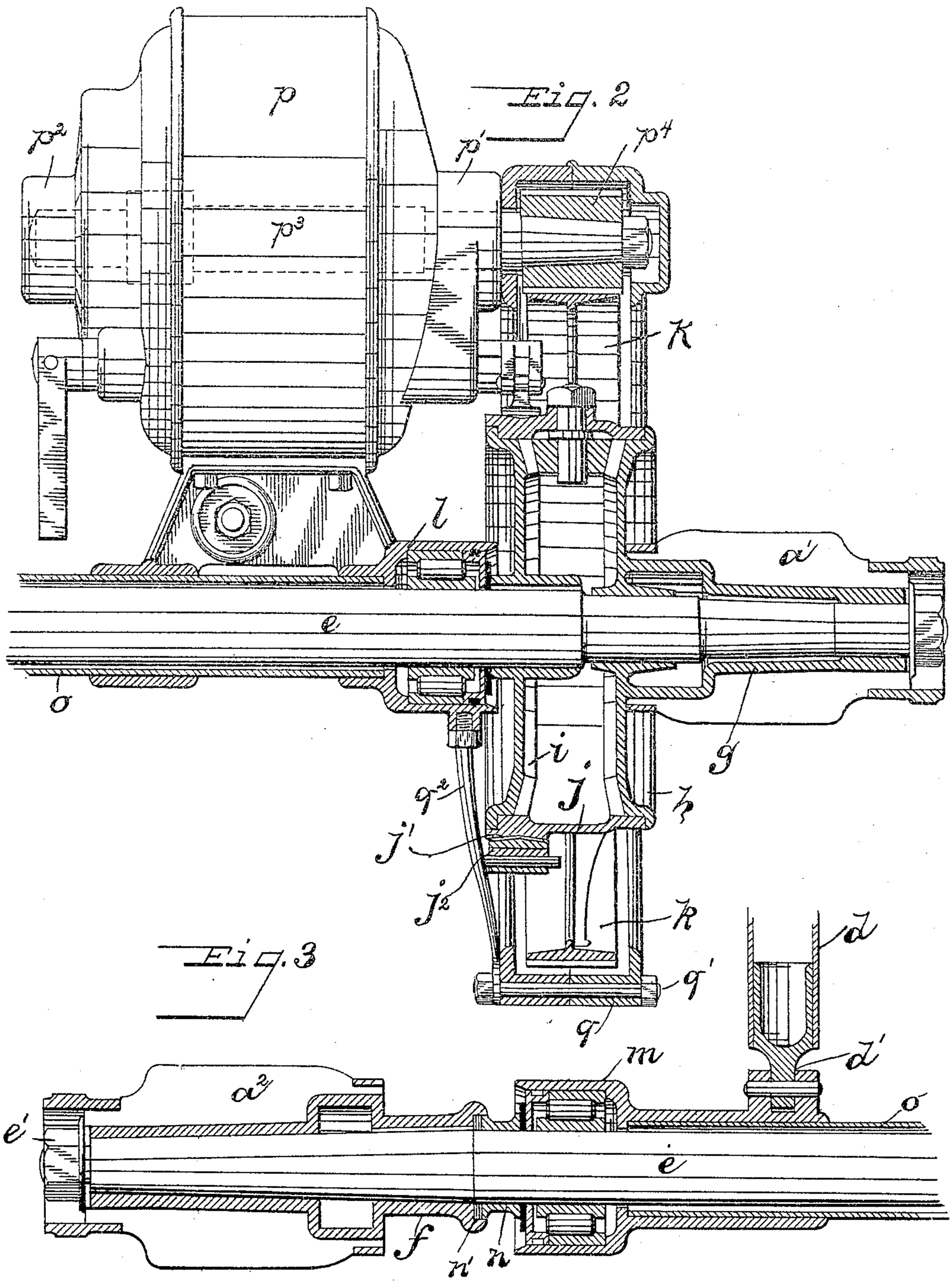

Fig. 3

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NO MODEL. 4 SHEETS—SHEET 3.

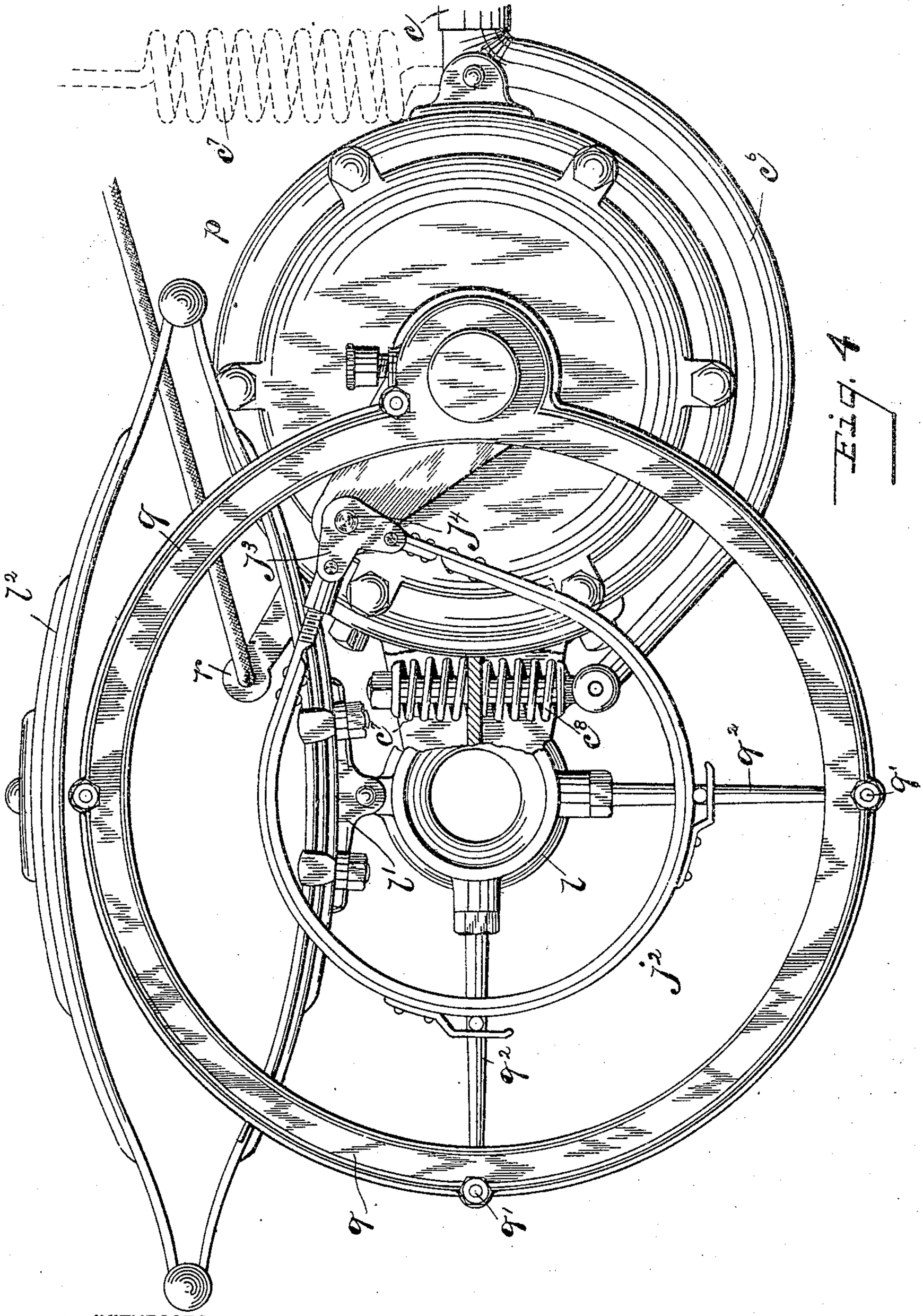

Fig. 4

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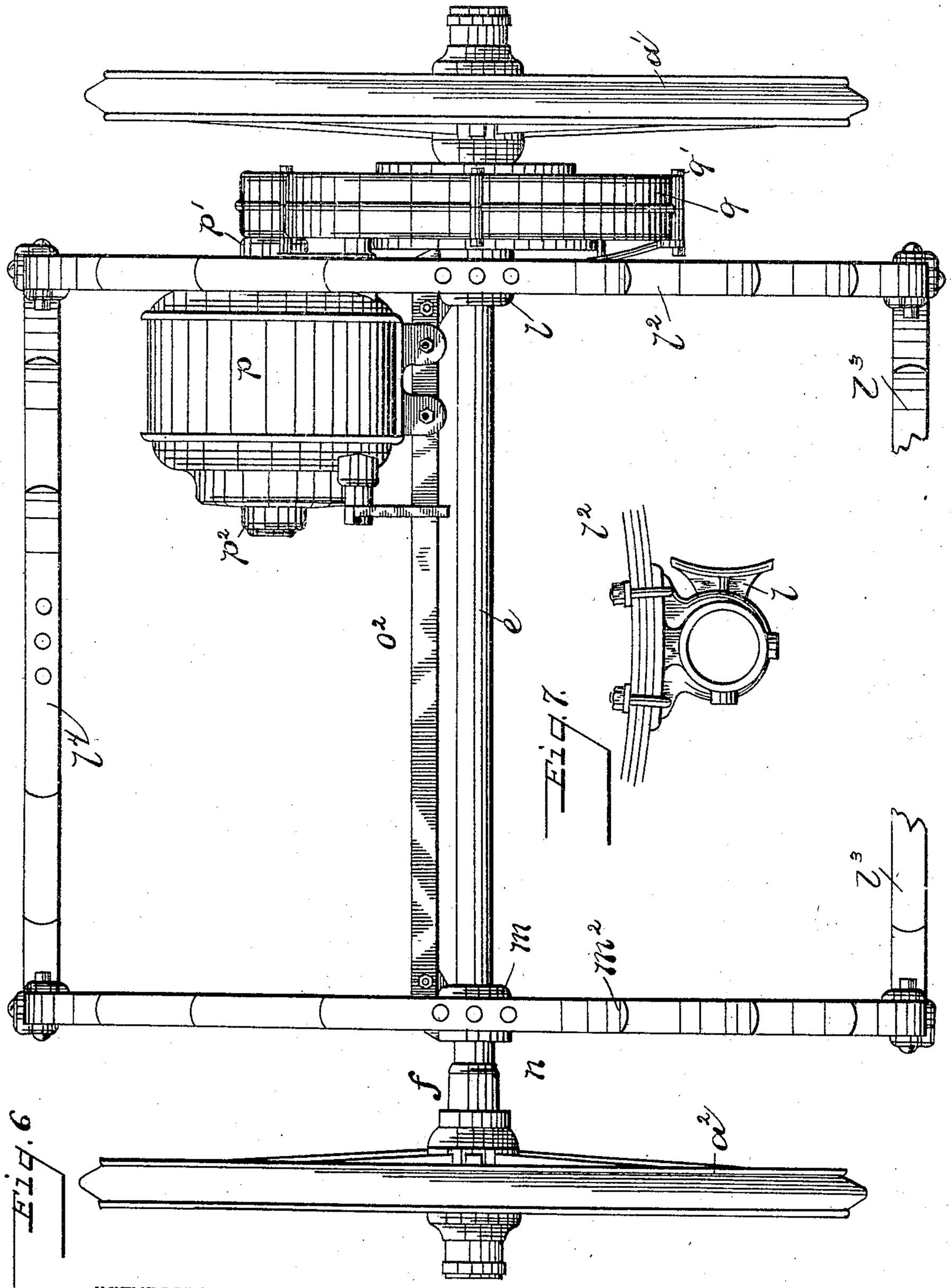
NO MODEL. 4 SHEETS—SHEET 4.



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No. 773,575. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

ALVARO S. KROTZ, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO PAUL A. STALEY, OF SPRINGFIELD, OHIO.

AUTOMOBILE.

SPECIFICATION forming part of Letters Patent No. 773,575, dated November 1, 1904.

Application filed February 21, 1903. Serial No. 144,544. (No model.)

To all whom it may concern:

Be it known that I, ALVARO S. KROTZ, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Automobiles, of which the following is a specification.

My invention relates to automobiles, more particularly to the running-gear and motor or power connections.

The object of my invention is to simplify and improve the construction, reduce the cost, and make more reliable the operation.

It has been the custom to construct running-gears and motors in which several different parts are rigidly connected or integrally formed so that it is difficult to renew any broken part thereof.

It is my aim to construct an improved running-gear such that either side bar, hereinafter described, can be readily removed without disarranging the other parts. In addition the construction is such that separate parts can be brazed together and afterward machined, so that in this way I avoid the possibility of the parts getting out of alinement, and the gear shown herein consists of four distinct parts, which are all interchangeable.

I attain these objects by the constructions shown in the accompanying drawings.

Figure 1 is a plan view of my invention. Figs. 2 and 3 are sectional views showing the driving-axle and its connecting parts. Fig. 4 is an end view showing the band-brake mechanism, motor-support, and gear-cover and its connections. Fig. 5 is a detail of the side-bar connection to the guiding-axle. Fig. 6 is a plan view of a modification, and Fig. 7 is a detail of same.

Like parts are represented by similar letters of reference in the several views.

In the construction of my gear I employ the usual vehicle-wheels A', A^2, A^3, and A^4, the guiding-axle B, and reaches or side bars C and D. The reaches are preferably connected to the guiding-axle B, as shown in Fig. 5, in which they are provided with a reduced extension C', which passes through the soft-rubber washers C^2 and metal ring C^3, which by reason of their shape and the drawing-up nut C^4 hold the extension C' centrally and allow the reach the necessary freedom. The smallest part of the opening of C^3 is some larger than the extension C', so that there is no metallic contact and no tendency to rattle. The ring C^3 and its fastening to the axle B is preferably formed at its top with a spring-foot C^5.

The driving-wheel A^2, as shown in Fig. 3, is keyed to the driving-axle E by means of a sleeve F, which is held in the wheel-hub and on the axle E by a nut E'. The driving-wheel A', Fig. 2, is attached to and held in a sleeve G in the same manner. It is obvious that instead of this construction the sleeve could be provided with flanges for receiving the spokes of the wheel, thereby discarding the wooden hub. The sleeve G is journaled freely on the axle E and is formed with or rigidly connected to the outer half H of the differential. The inner half I of the differential is keyed to the axle E, and the differential-ring J is journaled over the parts H and I and between the flanges on their periphery, as shown. This ring J is provided with a gear K and a trued surface J' on its inner side, upon which the brake-band J^2 operates. Between and adjacent to the sleeve F and the differential part I is journaled upon the axle E two body-supporting bearings L and M, which are rigidly or directly connected together by the casing O, which forms a hub extending between said differential and driving wheel A^2. A sleeve N acts as a thrust between M and F, and an adjustment can be had by the thin washers N', which are placed within the recess, as shown. The reach D is pivotally or flexibly connected to M by means of a joint D', or it might be pivoted or journaled over or to the casing O. The body-supporting springs are preferably attached by means of a pivoted piece L', Fig. 4, and either attached to the corner-bearings or their connections.

The motor P is directly or rigidly connected to L and provided with journals P' and P^2, in which a driving-shaft P^3 is journaled, as shown by the dotted lines in Fig. 2, and is

provided with a pinion P^4, which meshes with a gear K. While I have shown an electric motor, yet another power might be utilized, or instead of the motor a framework only could be provided and the shaft P^3 receive its power from another source. The reach C, Fig. 4, is pivoted to the motor P at its forward end and has an extension C^6, which passes under the motor and is connected to L by means of springs C^7 and C^8. This reach could, however, be rigidly connected to the forward end of the motor or on L, or the pivotal connection could be at the rear and the springs in front and accomplish the same results. Thus the motor is preferably spring-supported and permitted to vibrate around the driving-axle by reason of the corner-bearings. The motor pivotal or supporting points act also as body-supporting bearings, which are preferably fitted with antifriction-bearings, as shown. The flexible side-bar connections to the guiding-axle and the pivotal connections at the driving-axle permit the desired flexibility.

In Fig. 4 I have shown by dotted lines the spring C^7, which can be attached to the body-sill, and thereby dispense with the use of the side-bar support for the motor.

In Figs. 6 and 7 the body-supporting springs L^2 and M^2 are rigidly connected to the corner-bearings or motor-pivot, thereby holding the motor in working position without the use of side bars. To assist in supporting and holding down the motor, cross-springs L^3 and L^4 may be provided. The corner-bearings are shown connected together by a bar or brace O^2, the axle B being exposed and the motor bolted directly to the bar.

Referring again to Figs. 2 and 4, the gear K and pinion P^4 are protected by the gear-case Q, which is preferably formed in halves, as indicated in Fig. 2, and is held together and in position by bolts Q′, by means of arms Q^2, and the journal P′. This gear-cover is preferably made to cover only the periphery of the gear, as shown in Figs. 2 and 4.

The brake-lever R acts upon the brake-band J^2, through a bell-crank J^3 and shaft J^4. The motor acts as a support for the shaft J^4, which passes through the motor and between its field-pieces. Thus no additional fixtures are necessary for the brake mechanism, and all the working parts are formed in such a manner as to prevent displacement.

The motor-supporting reach might be located near the center of the gear and the other dispensed with or numerous other minor changes made without departing from the scope of the invention.

Having thus described my invention, I claim—

1. The combination of a driving-axle and driving-wheels, one of said wheels being rigidly connected and the other journaled to said driving-axle, a differential adjacent to said journaled driving-wheel, a part of which is directly connected thereto, and body-supporting corner-bearings rigidly connected together, a motor adjacent to said differential and rigidly connected to said corner-bearings, body-supporting springs rigidly connected to said corner-bearings, and a cross-spring, whereby the motor is held in a normal working position, substantially as and for the purpose specified.

2. The combination of a driving-axle and driving-wheels, one of which is rigidly connected, and the other journaled to said driving-axle, a differential adjacent to and a part of which is directly connected to said journaled driving-wheel, corner-bearings rigidly connected together forming a hub between said differential and rigidly-connected driving-wheel, and a motor rigidly connected to said hub adjacent to said differential to pivot the motor to said driving-axle and to hold it in perfect alinement, and a gear-cover, projecting arms from said corner-bearings to support said cover, and means to rigidly attach said cover to said motor, whereby the gear-cover is a part of and vibrates with said motor and its support, substantially as and for the purpose specified.

3. The combination of a driving-axle and driving-wheels, one of which is rigidly connected and the other journaled to said driving-axle, and a differential adjacent to and a part of which is directly connected to said journaled driving-wheel, corner-bearings rigidly connected together forming a hub between said differential and rigidly-connected driving-wheel, and a motor rigidly connected to said hub adjacent to said differential, to pivot the motor to said driving-axle to hold it in perfect alinement, a brake-shaft supported by said motor and having a friction-band adapted to act upon said differential, and a gear-cover rigidly held to the corner-bearing and motor whereby the gear-cover is a part of and vibrates with said motor and its support, substantially as and for the purpose specified.

4. The combination of a driving-axle and driving-wheels, one of which is rigidly connected and the other journaled to said driving-axle, and a differential with a gear directly connected with said journaled driving-wheel and driving-shaft, directly-connected corner-bearings between said differential and rigidly-connected driving-wheel, a driving-shaft-carrying frame attached to said corner-bearings and adjacent to said differential, said driving-shaft having a pinion meshing with said differential-gear and a brake-shaft and band acting upon said differential, said brake-shaft being carried by said driving-shaft-carrying frame, for the purpose specified.

5. The combination of a driving-axle and driving-wheels, one of which is rigidly connected and the other journaled to said driving-axle, and a differential with a gear directly

connected with said journaled driving-wheel and driving-axle, directly-connected corner-bearings between said differential and rigidly-connected driving-wheel, a driving-shaft-carrying frame attached to said corner-bearings adjacent to said differential, said driving-shaft having a pinion meshing with said differential-gear and a brake-shaft and band acting upon said differential, said brake-shaft being carried upon said driving-shaft-carrying frame, and a gear-cover rigidly held to said carrying-frame and its corner-bearings, for the purpose specified.

6. The combination of the guiding-axle, a plurality of reaches connected thereto, a driving-axle and driving-wheels, and a differential adjacent to one of said driving-wheels, body-supporting bearings directly connected together and located between said differential and one of said driving-wheels forming a hub, a motor rigidly connected to said hub and adjacent to said differential whereby said motor is pivoted to said driving-axle and held in working position with said differential, and connecting devices for pivoting each reach to said hub, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 13th day of February, A. D. 1903.

ALVARO S. KROTZ

Witnesses:
CHAS. I. WELCH,
CLIFTON P. GRANT.