

No. 662,207.

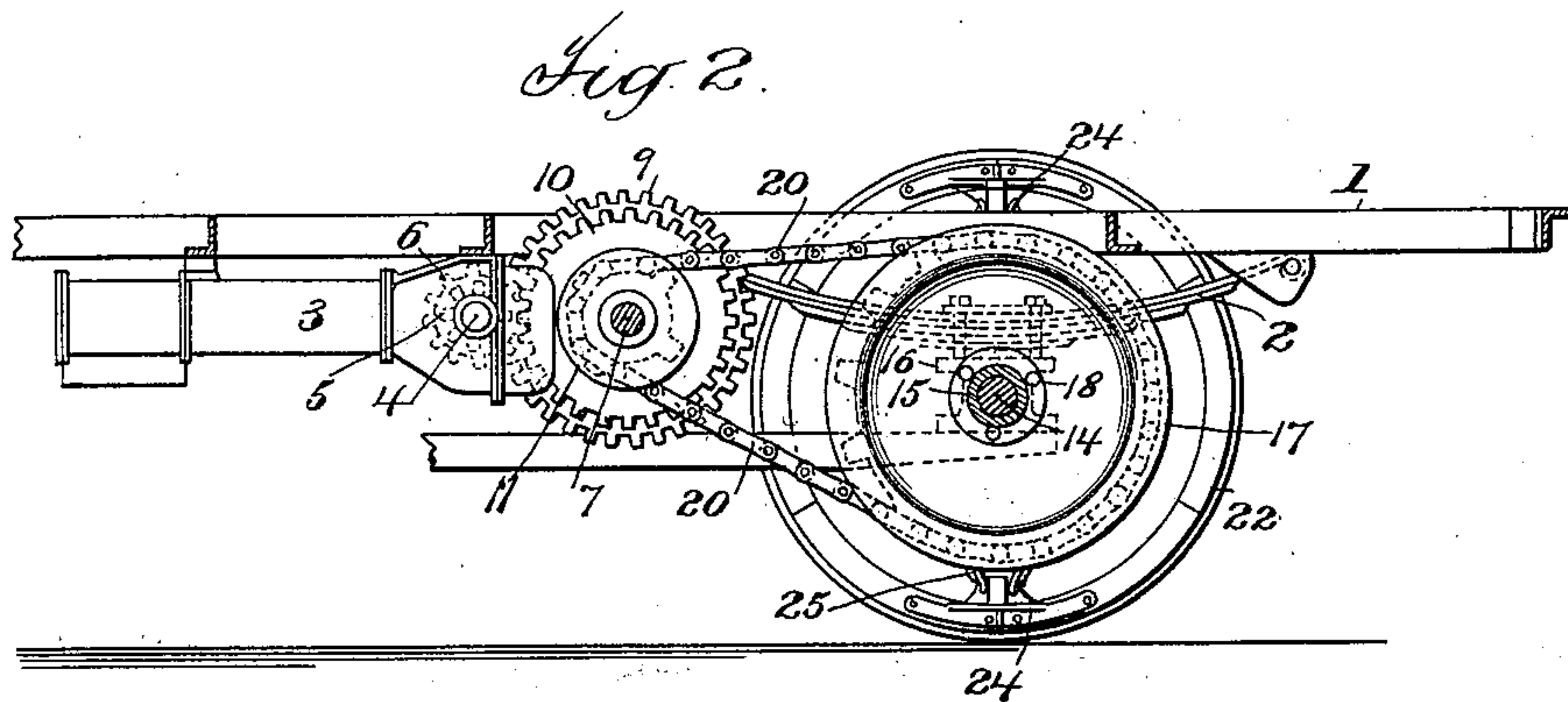
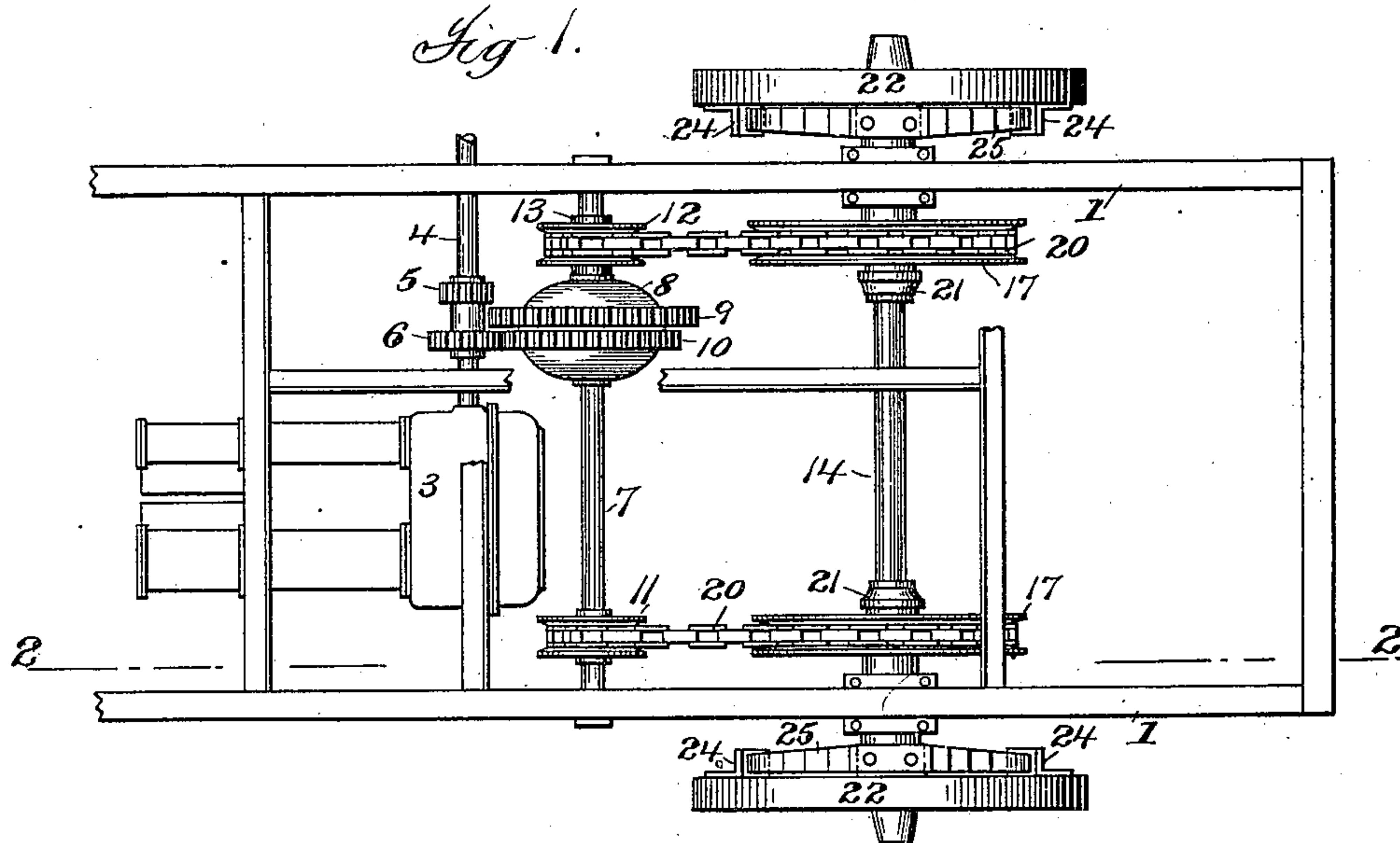
Patented Nov. 20, 1900.

J. E. THORNYCROFT.
DRIVING MECHANISM FOR MOTOR VEHICLES.

(Application filed Aug. 21, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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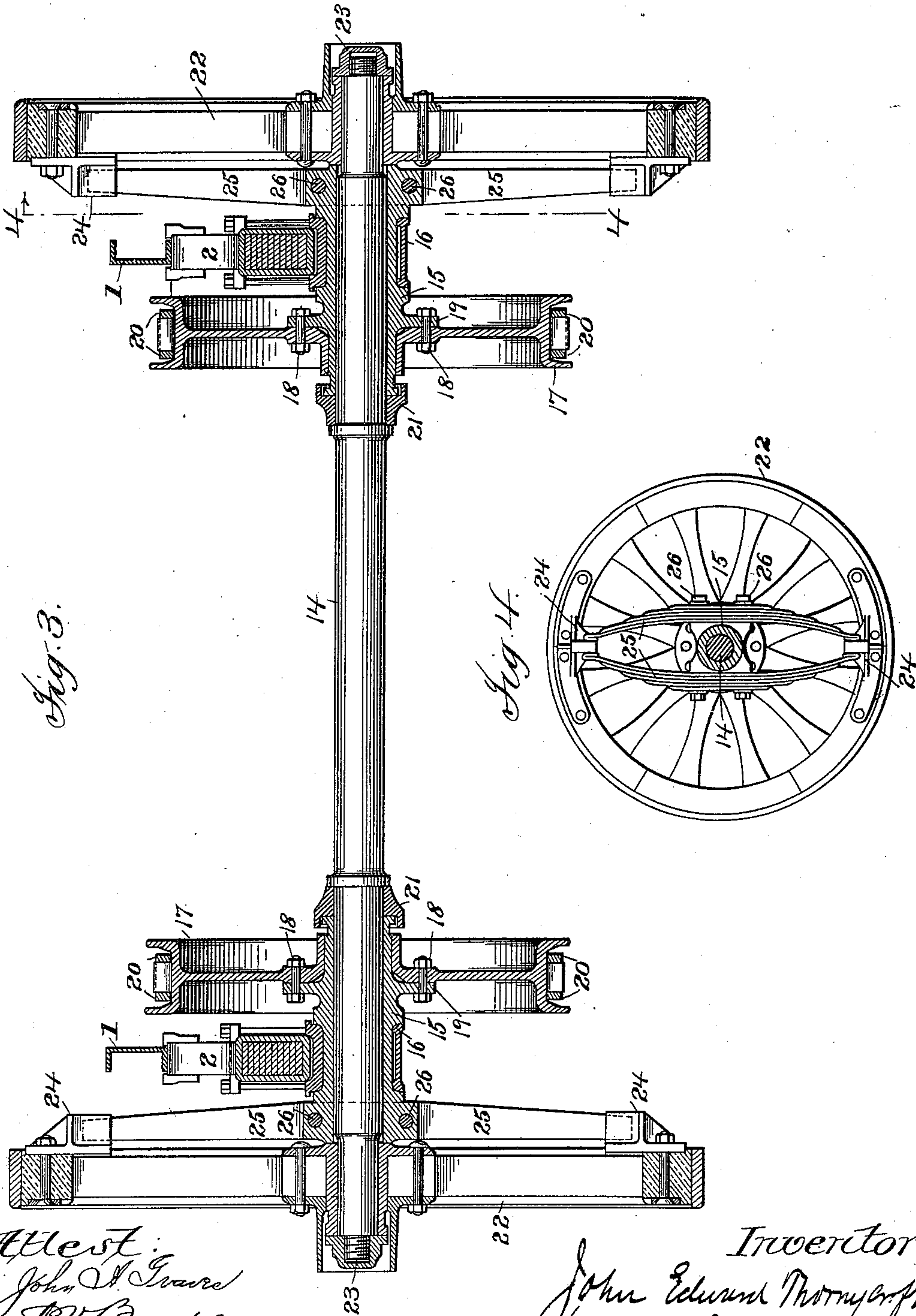


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 662,207, dated November 20, 1900.

Application filed August 21, 1900. Serial No. 27,539. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDWARD THORNYCROFT, a subject of the Queen of Great Britain and Ireland, residing at Homefield, Chiswick, London, county of Middlesex, England, have invented certain new and useful Improvements in Driving Mechanism for Motor-Vehicles, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in the driving mechanism for motor-vehicles.

In certain classes of motor-vehicles it is desirable to transmit power from the engine or motor to the driven or road wheels by means of sprocket-and-chain gearing, for the reason that since the engine or motor is usually carried on a spring-mounted frame and the wheels are rigidly mounted the sprocket-and-chain gearing permits the spring-mounted engine to move with respect to the axle on which the driven or road wheels are mounted, thus doing away with the more or less complicated driving connection between the engine and the wheels, which is used to effect the same result. Sprocket-and-chain gearing as usually constructed, however, is objectionable, because the chain is not adapted to withstand shocks and strains incident to the sudden changes of speed, and since, furthermore, the sprocket-wheels are usually mounted in close proximity to the road or driven wheels, dirt and grit are deposited on them, causing both the chain and the gears to wear. Furthermore, with the sprocket-wheels located as is usual it is difficult to remove and replace the road-wheels.

It is one of the objects of this invention to produce a driving-gearing for motor-vehicles in which a sprocket-and-chain drive may be employed and in which a yielding connection is interposed between the road or driven wheels and the chain, so as to relieve the strains caused by the sudden changes of speed of the vehicle, thereby prolonging the life of the chain.

A further object of the invention is to so locate the sprocket-wheels which drive the driven-wheels that mud and grit will not be deposited upon them from the driven or road wheels and at the same time make it possible

to readily remove and replace the road or driven wheels.

A further object of the invention is to so arrange the sprocket-and-chain gearing as to relieve the rear axle from the twisting strains to which it is ordinarily subjected.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same parts, Figure 1 is a plan view of so much of a motor-vehicle as is necessary to an understanding of the invention. Fig. 2 is a side view of the construction shown in Fig. 1. Fig. 3 is an elevation, on a larger scale, of the rear axle, the road-wheels and the parts immediately connected with the axle being shown in section. Fig. 4 is a section on the line 4 4 of Fig. 3.

Referring to the drawings which illustrate one embodiment of the invention, 1 indicates the underframe, which is or may be supported on the axles by suitable springs. In the construction shown the springs for the under frame, which support it on the rear axle, are marked 2. The front axle and the front portion of the frame are not shown, as they are not necessary to an understanding of the invention. The motor or engine, which may be of any suitable form, is indicated at 3, said motor being supported in any suitable manner on the spring-mounted underframe. The main shaft of the engine is indicated at 4, said shaft being provided with change-gears 5 and 6 for varying the speed of the vehicle.

Mounted in any suitable manner in the underframe is a counter-shaft 7, which is provided with any suitable form of differential gearing, an ordinary form being indicated at 8, the driving-gears 9 and 10 of said gearing being arranged to mesh with the gears 5 and 6, mounted on the shaft 4. Any suitable means may be employed for controlling the position of the change-gears, that shown in my application Serial No. 733,735, filed October 16, 1899, being preferred. The counter-shaft 7 has rigidly secured to it a sprocket-

wheel 11, and a similar sprocket-wheel 12 is secured to a sleeve 13, which is connected in turn to the differential gear, as is usual in such constructions.

5 The rear axle 14, upon which the driven or road wheels are mounted, in the form of the machine shown is a rigid axle extending from side to side of the vehicle and is supported in boxes 15, which turn in bearings 16, 10 said bearings being carried by the rear springs 2. The boxes 15 have rigidly connected to them sprocket-wheels 17. These sprocket-wheels may be of any suitable form, but are preferably flanged, as shown, to keep the 15 chain from slipping off them sidewise, and may be connected to the boxes in any suitable manner. In the construction shown, bolts 18 pass through the body portion of the wheels and through flanges 19, cast on the 20 boxes. These sprocket-wheels 17 are driven from the gears 11 and 12 by means of sprocket-chains 20. The boxes 15 are shown as abutting against suitable collars 21, mounted on the axle, and turn freely in their bearings 16. 25 Mounted on the ends of the axle 14 are the road-wheels 22, said wheels being held in position on the axle by means of cap-nuts 23, or in any other suitable manner. Blocks 24 are secured to the felloes of the road-wheels, and 30 these blocks are engaged by pairs of springs 25, which are secured to the boxes 15 in any suitable manner, as by bolts 26, which engage tapped holes in castings which are integral with the boxes. The wheels and 35 springs are constructed substantially as described and claimed in my application Serial No. 733,735, above referred to.

40 With the construction before described it will be seen that by elongating the boxes somewhat the sprocket-wheels instead of being located close to the road-wheels and in position to receive mud and grit therefrom can be carried well in toward the center of the vehicle. Furthermore, the strains due to sud- 45 den changes in speed of the vehicle are largely taken up by the springs 25 instead of being borne by the chains alone, as is the case when the chains drive sprocket-wheels which are rigidly connected with the road-wheels. It 50 will be also noticed that each road-wheel is driven independently, and since each wheel is independently driven and turns freely on the axle there is no twisting or winding strains on the axle when the wheels are driven 55 at unequal speeds, as is the case, for instance, when the vehicle is turned.

While the construction which has been described embodies the preferred form of the

invention, it is to be understood that changes and modifications may be made without departing from the invention. The invention is not therefore to be limited to the specific details of construction which have been described. 60

What is claimed is— 65

1. In a motor-vehicle, the combination with a spring-mounted frame, of a motor carried thereby, a shaft driven by the motor, sprocket-wheels mounted on the shaft, a rigid axle, boxes mounted on the axle, sprocket-wheels 70 rigidly connected to the boxes, sprocket-chains connecting said sprocket-wheels with the sprocket-wheels on the driven shaft, road-wheels mounted on the axle, and springs between the boxes and the road-wheels, substantially as described. 75

2. In a motor-vehicle, the combination with a shaft, of a sprocket-wheel rigidly fixed thereto, a sleeve on the shaft, a sprocket-wheel rigidly fixed to the sleeve, a differential gear for 80 driving the shaft and sleeve, a rigid axle, a pair of boxes mounted on the axle, a sprocket-wheel mounted on each box, sprocket-chains connecting these wheels with the sprocket-wheels driven by the differential gear, a pair 85 of road-wheels, and springs between the boxes and the road-wheels, substantially as described.

3. In a motor-vehicle, the combination with a frame, of a pair of springs by which it is 90 supported at one end, a bearing carried by each of the springs, a box mounted to rotate in each of the bearings, a rigid axle extending through the boxes, a pair of road-wheels loosely mounted on the axle, springs between 95 each box and the road-wheels, a sprocket-wheel connected to each of the boxes, a counter-shaft mounted in the frame, a sprocket-wheel rigidly connected to the counter-shaft, a sleeve loosely mounted on the counter- 100 shaft, a sprocket-wheel rigidly connected to the sleeve, a differential gear for driving the shaft and sleeve, sprocket-chains connecting the sprocket-wheels on the counter-shaft and sleeve, sprocket-chains connecting the 105 sprocket-wheels on the boxes with the sprocket-wheels on the sleeve and shaft, and a suitable motor for driving the differential gear, substantially as described.

In testimony whereof I have hereunto set 110 my hand in the presence of two subscribing witnesses.

JOHN EDWARD THORNYCROFT.

Witnesses:

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H. MAYKELS.