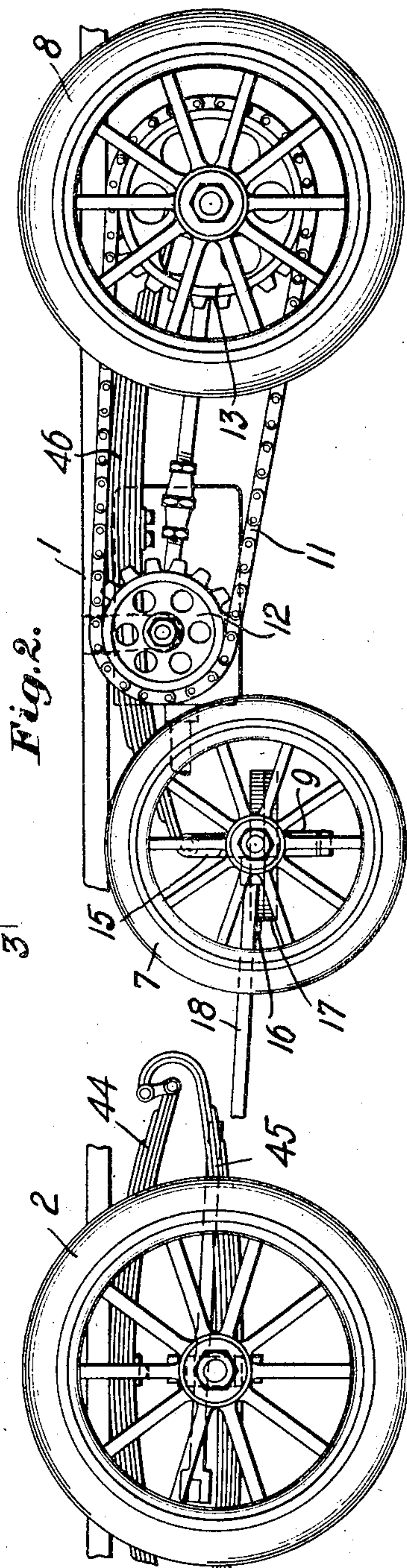
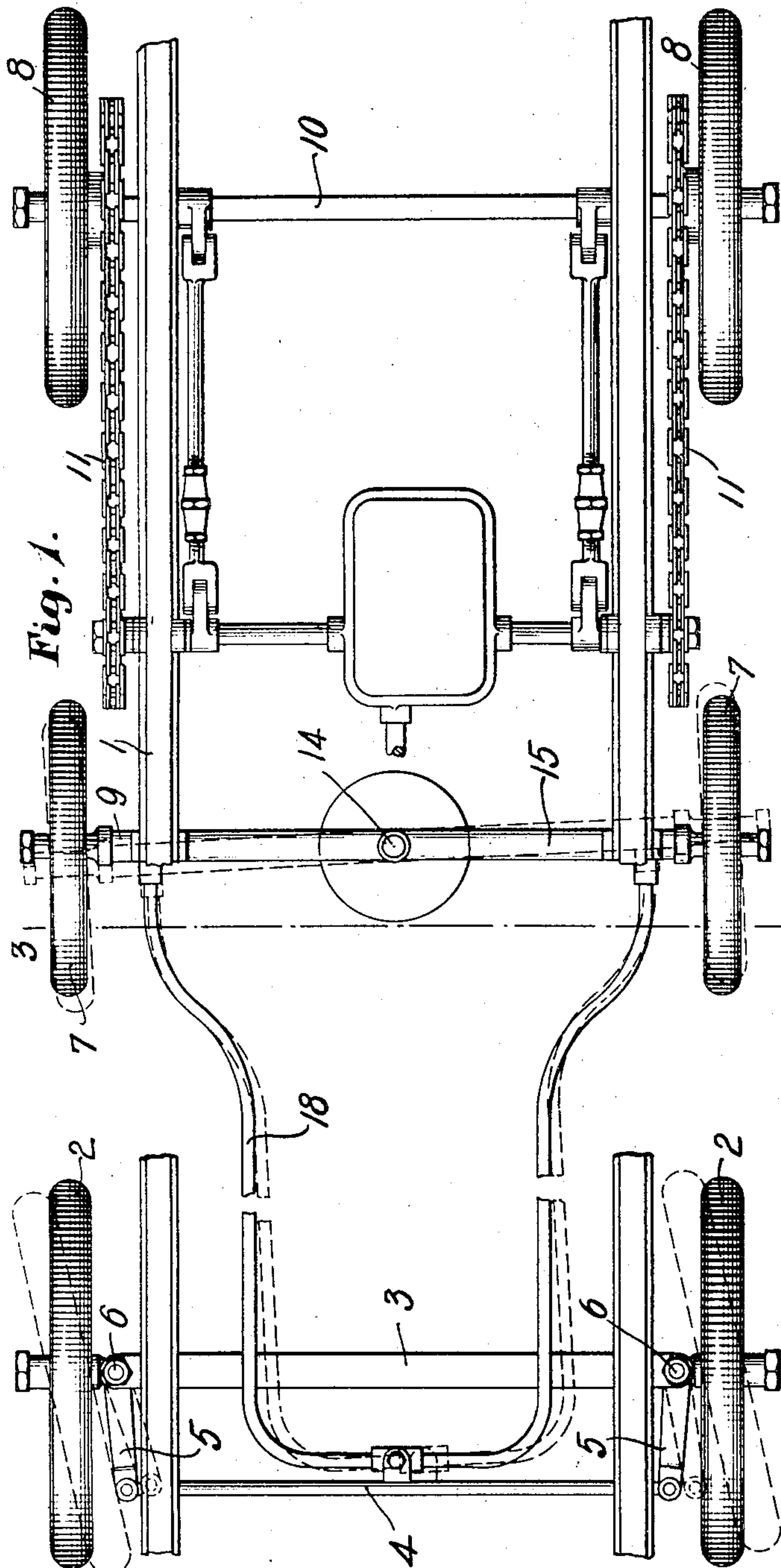


I. E. PALMER.  
 TRACKLESS POWER DRIVEN VEHICLE.  
 APPLICATION FILED MAY 6, 1908

938,783.

Patented Nov. 2, 1909.  
 3 SHEETS—SHEET 1.



Witnesses:  
 Walter L. Pence  
 Irving H. Townsend

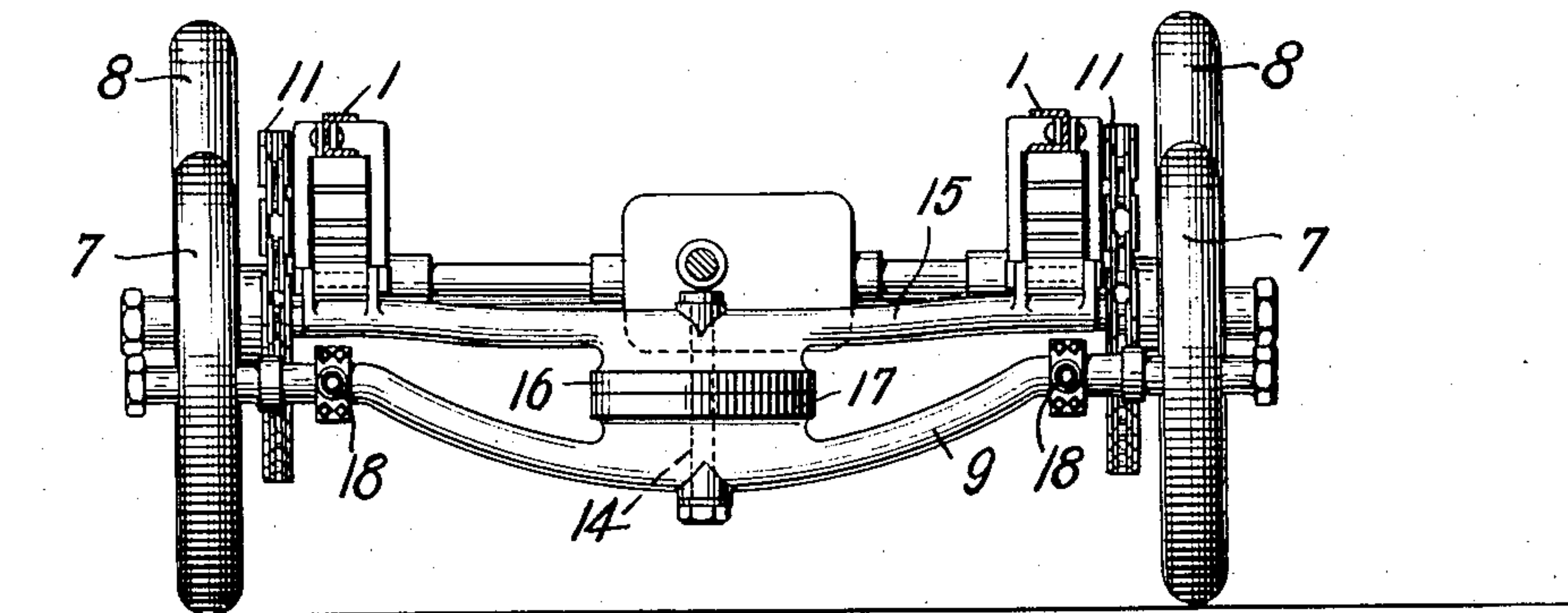
Inventor:  
 Isaac E. Palmer,  
 by Emery and Borch Attys.

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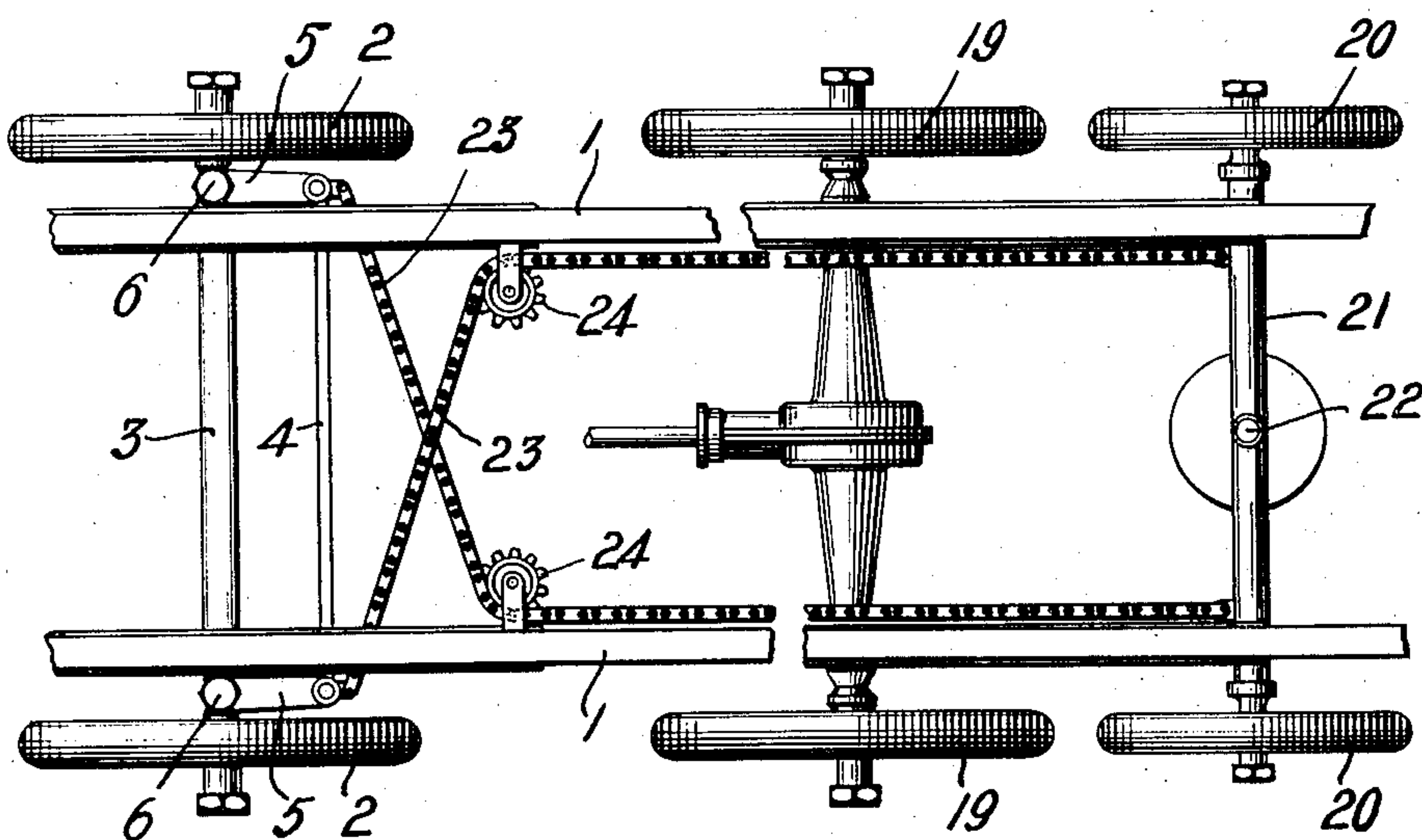
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*Fig. 3*



*Fig. 4.*



*Witnesses:*

*Walter L. Price*  
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*Inventor:*

*Isaac E. Palmer,*  
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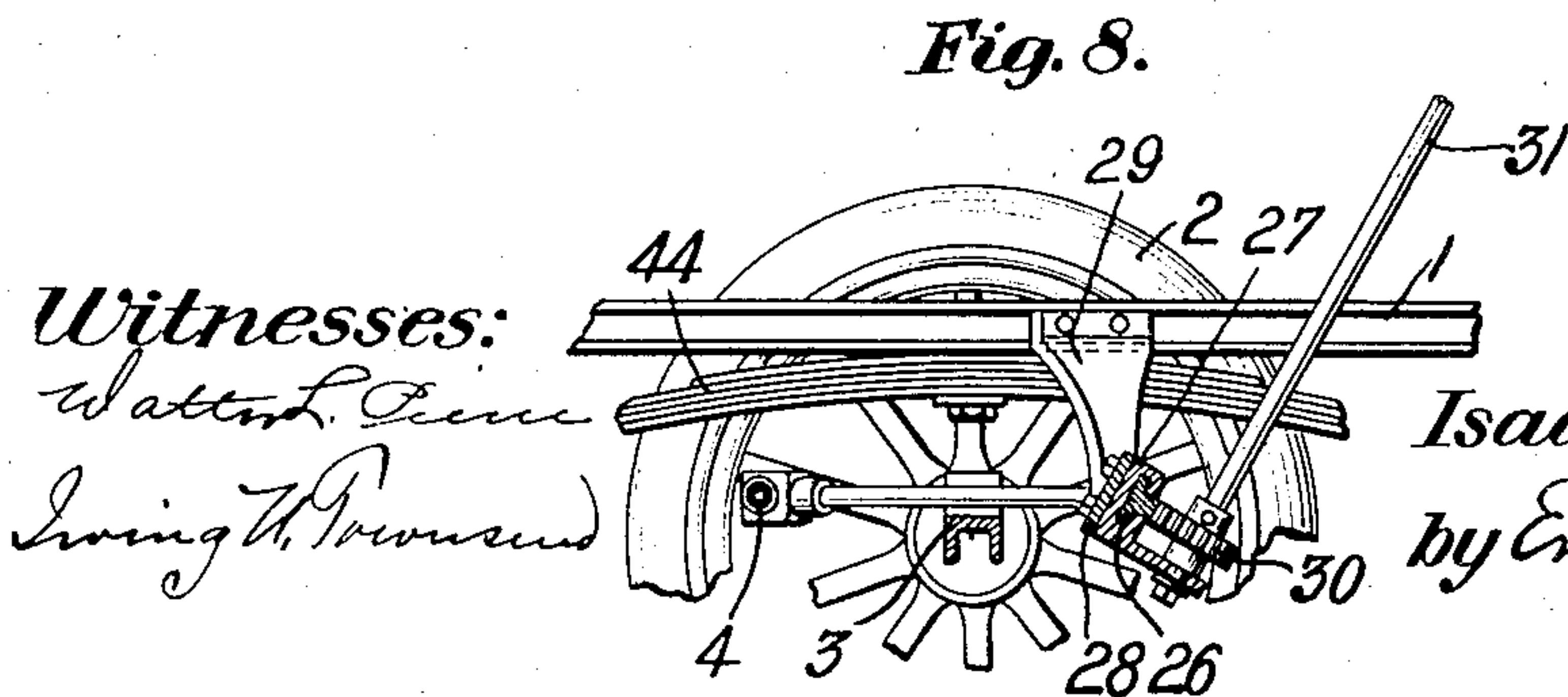
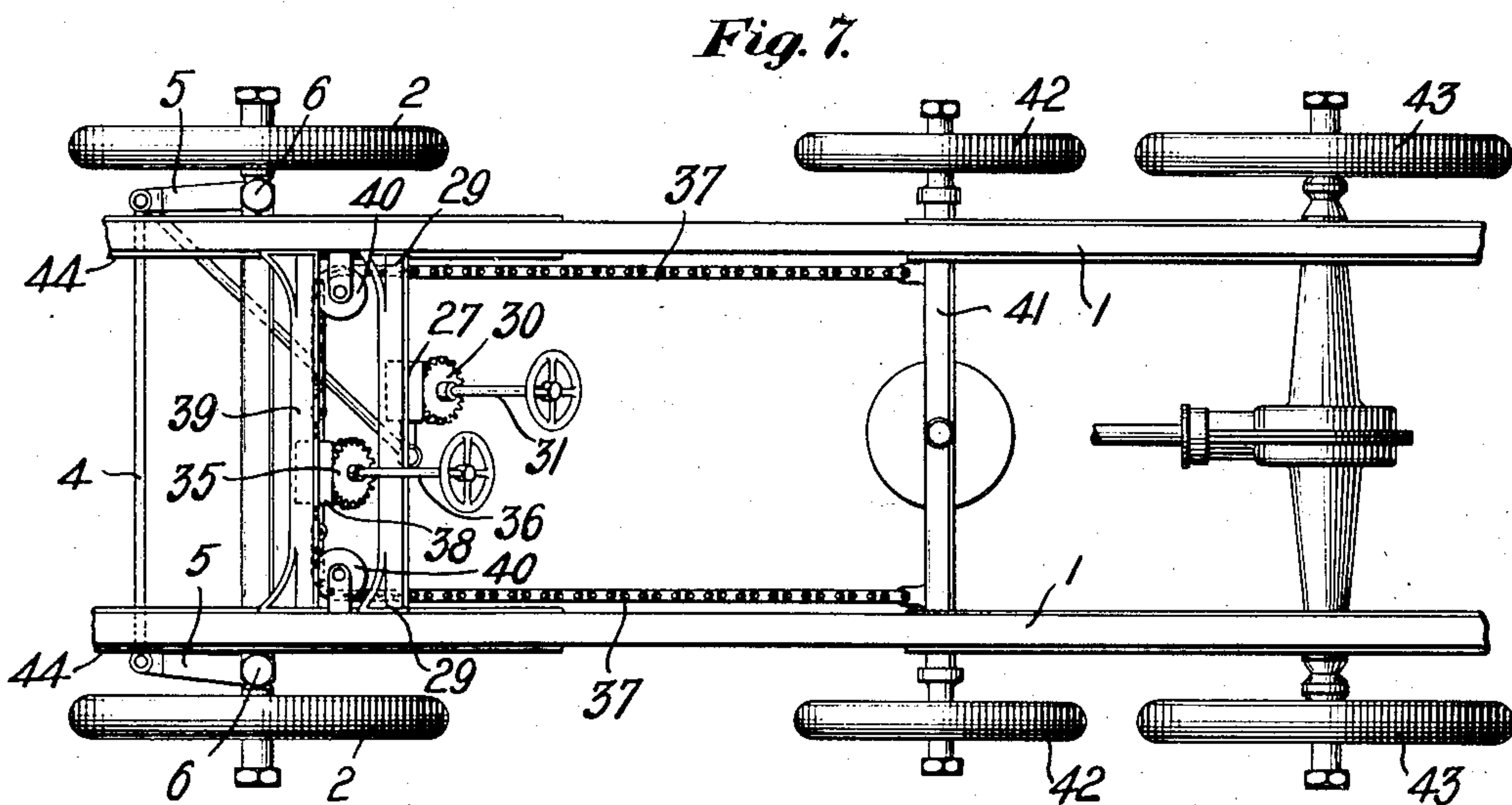
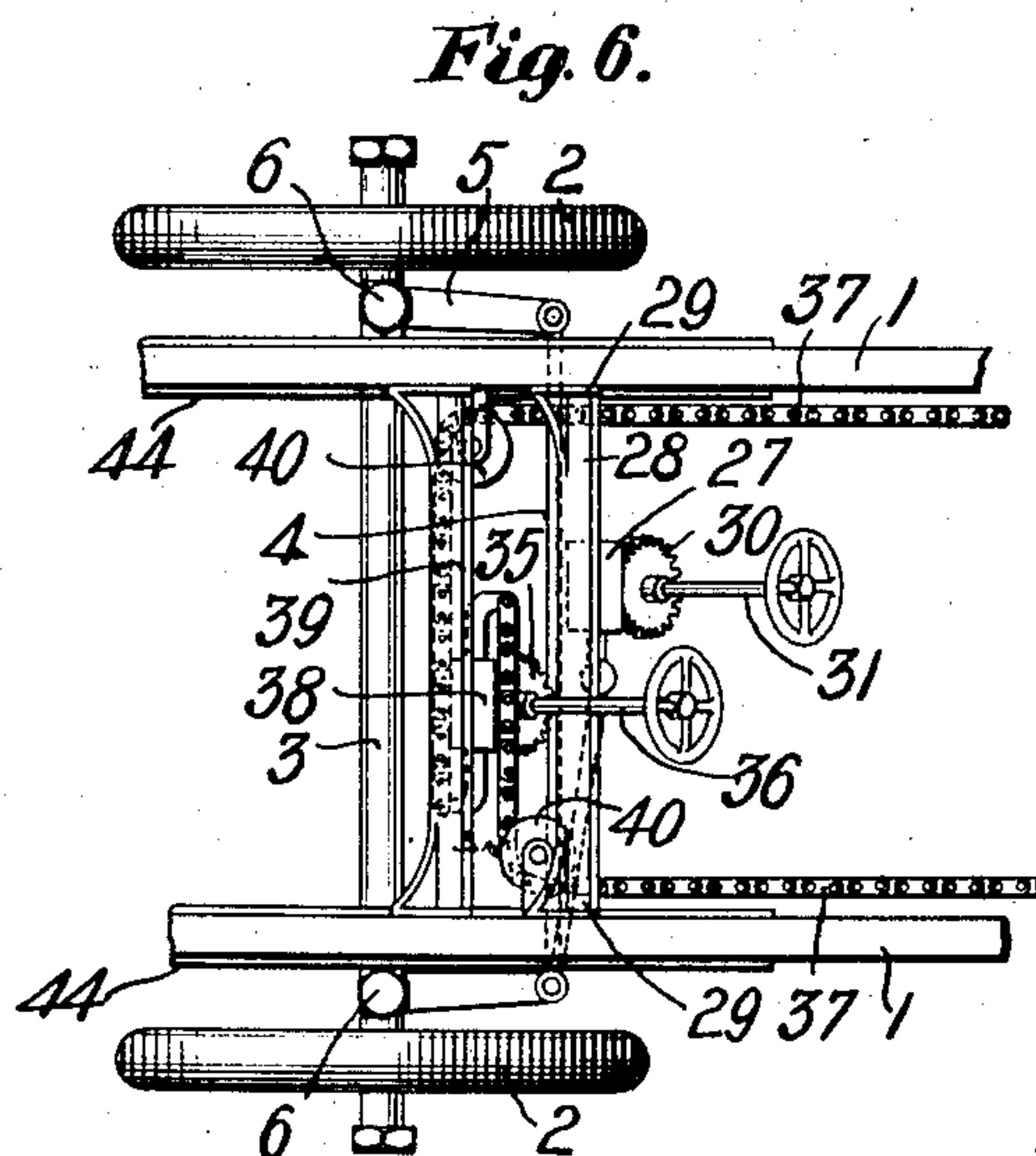
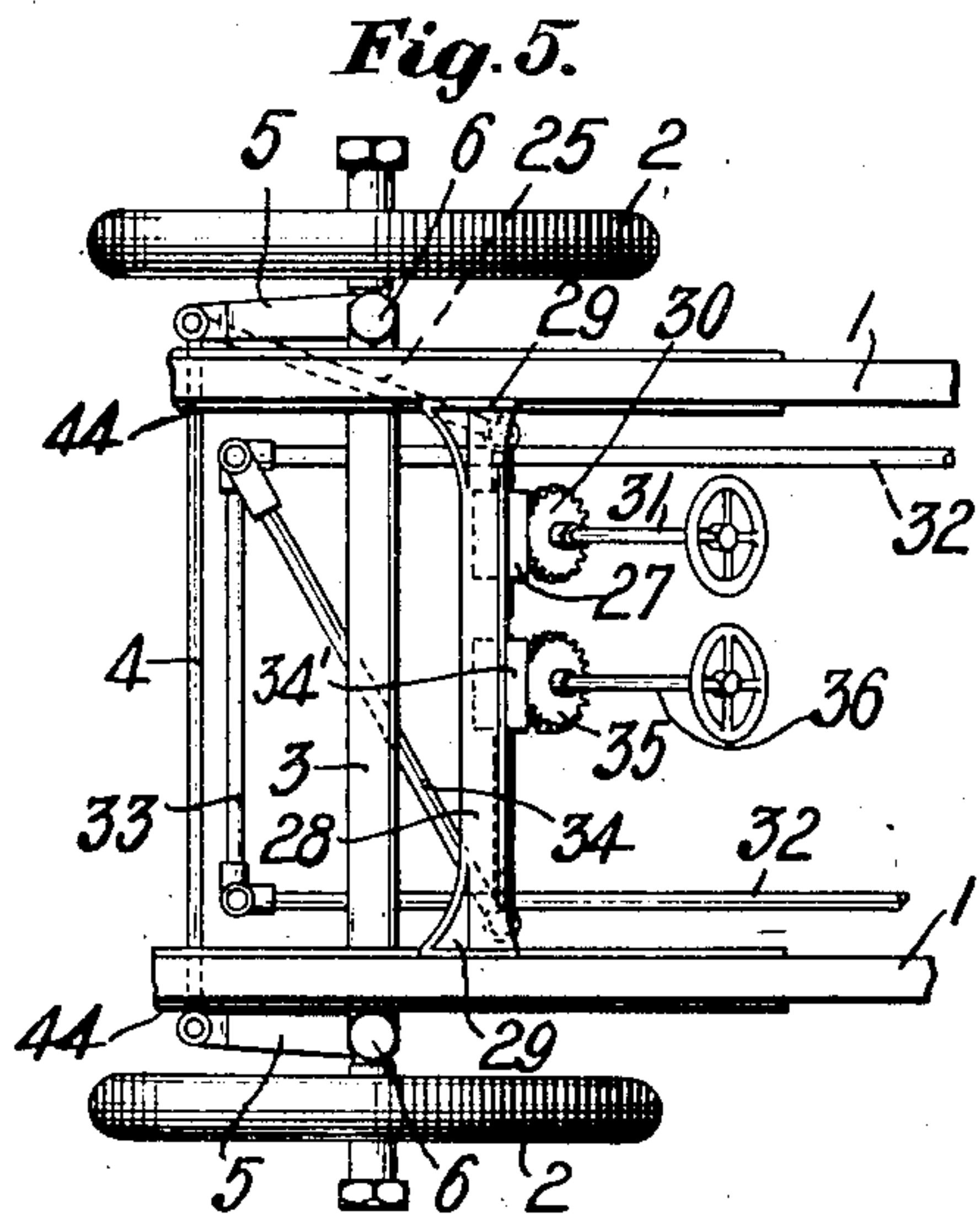


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3 SHEETS—SHEET 3.



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 Walter L. ...  
 Irving H. ...

Inventor:  
 Isaac E. Palmer,  
 by Emory and Borch.  
 Attys



# UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

TRACKLESS POWER-DRIVEN VEHICLE.

938,783.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed May 6, 1908. Serial No. 431,156.

*To all whom it may concern:*

Be it known that I, ISAAC E. PALMER, a citizen of the United States, and a resident of Middletown, in the county of Middlesex and State of Connecticut, have invented an Improvement in Trackless Power-Driven Vehicles, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to trackless power driven vehicles and has more particularly for its objects to provide a construction whereby if desired the use of pneumatic tires may be avoided, to provide increased traction, to provide more extensive wheel support so as to reduce the weight upon individual wheels, to reduce the liability of skidding, and to provide if desired compensating devices for the laterally deflectable wheels.

In order that the principles of the invention may be clearly understood, I have disclosed certain types or embodiments of my invention in the accompanying drawings, wherein—

Figure 1 is a plan view of a form of trackless power driven vehicle embodying my invention, parts being broken away; Fig. 2 is a side elevation thereof; Fig. 3 is a section upon the line 3—3 of Fig. 1 looking toward the rear, the intermediate wheels being in elevation; Fig. 4 is a plan view of a slightly modified form of my invention; Fig. 5 is a plan view of the forward portion of a trackless power driven vehicle having separate steering means for the front and rear wheels; Fig. 6 is a modified form of such construction; Fig. 7 is a further modified form thereof; and Fig. 8 is a detail representing in vertical longitudinal section the preferred manner of mounting the steering devices shown in Figs. 5, 6 and 7.

Referring first to the form of the invention represented in Figs. 1 to 4 inclusive, the body frame of the automobile is represented at 1, it being of any suitable type and construction. The body frame is composed as shown of opposite, preferably unitary side members of substantially the length of the automobile and transverse connections, thus affording the substantially rigid unitary structure. Thereto I have connected the leading wheel or wheels, herein represented as a pair of wheels 2 mounted for lateral or guiding deflection relative to the longi-

tudinal axis of the vehicle upon the axle 3. The said wheels and the other wheels of the vehicle may be mounted in transverse alignment or out of transverse alignment as found desirable. Steering movement may be imparted to said wheels 2—2 in any suitable manner, as by means of a transverse rod 4 pivotally connected to the levers 5—5, which are pivotally mounted at 6 upon the axle 3, it being apparent that when axial movement is imparted to the rod 4, the wheels 2—2 are laterally deflected in the desired direction. Such steering movement may be imparted by any suitable steering mechanism (not herein shown) operatively connected to the said rod 4.

In the present form of the invention, I have represented two pairs of rear wheels 7—7 and 8—8 mounted respectively upon axles 9 and 10. While either pair of rear wheels may be driven, I have herein represented the rear wheels 8—8 as driven by sprocket chains 11—11 mounted upon sprocket gears 12 and 13, to the former of which power may be applied in any suitable manner. It is evident that any suitable driving means may be employed.

In certain forms of my invention, I may employ other arrangements of rear wheels, as, for example, but a single pair thereof. I contemplate the mounting of a pair of rear wheels, and in the present invention one of the two pairs of rear wheels, upon an axle which itself is mounted for pivotal movement in a horizontal plane, so that steering movement may be imparted thereto. In Figs. 1, 2 and 3, I have represented the axle 9 as so mounted, and for this purpose I have in said figures represented the axle 9 as pivotally mounted upon a vertical bolt 14 passing through said axle and the transverse web 15 of the frame, said axle and frame being herein represented as provided with enlarged contacting or bearing surfaces 16 and 17. Steering movement may be imparted to the wheels upon the axle 9 in any suitable manner. In the form of the invention illustrated in Figs. 1, 2 and 3, I have connected the said axle 9 to the rod 4 by a yoke 18. It is, of course, apparent that any suitable connection may be employed. When steering movement is imparted to the rod 4 and thence to the wheels 2—2, it will be apparent that turning movement is likewise imparted to the wheels 7—7, but to a less extent, owing to the relation and connection of the sev-



eral parts. Owing to the sufficient looseness of the parts and the resiliency of the said yoke 18, the desired steering movement may be imparted through the rod 4 and yoke 18.

5 In Fig. 4 I have represented a vehicle having front wheels 2—2 and two sets of rear wheels 19—19 and 20—20, the forward set of said rear wheels being driven in any suitable manner, as, for example, by a shaft drive. 10 The wheels 20—20 are mounted upon an axle 21, which is pivotally mounted by means of a vertical bolt 22 in a manner similar to the mounting of the axle 9 in Figs. 1, 2 and 3. In this form of the invention, steering movement may be imparted to the front wheels 15 2—2 in any suitable manner, as, for example, by imparting axial or longitudinal movement to the rod 4, and in any desired manner turning movement may be imparted to the axle 21. Herein, for the purpose, I have represented chains 23—23 connected at their 20 forward ends to the extremities of the levers 5—5 and at their rear ends to the axle 21, they being herein represented as guided intermediate their ends by sprocket wheels 24 suitably mounted in the framing of the vehicle.

In Figs. 5 to 8 inclusive, I have represented certain forms of my invention embodying 30 front wheels and preferably more than a pair of rear wheels with separate steering means for the front wheels and the rear wheels or certain of them. In Fig. 5 I have represented the forward portion of a vehicle 35 having leading wheels 2—2, to which steering movement may be imparted by means of levers 5—5, the transverse rod 4 and a link 25 pivotally connected at one end to one of the levers 5 and at its other end to a rack 26 40 (see Fig. 8) mounted for sliding movement in a suitable guide way 27, herein represented as secured to a transverse member 28 formed with or secured to hangers 29 secured to the body frame of the vehicle. A 45 pinion 30 upon the lower end of the spindle 31 of the steering mechanism meshes with the said rack 26, and thereby imparts steering movement to the wheels 2—2. It is apparent that the forward portion of the vehicle represented in Fig. 5 may be employed 50 with any suitable construction of rear portion thereof; as, for example, the construction shown in said figure may be employed in connection with a vehicle having more 55 than two pairs of rear wheels and wherein, if two pairs of rear wheels be employed, either pair may be driven and the other pair be mounted for lateral deflection. In said figure are represented connecting rods 32—32 60 adapted to be suitably connected to the rear wheels or to any pair of rear wheels, if more than a single pair thereof be employed. In order to impart steering movement to such movable pair of rear wheels, which are preferably 65 mounted upon a turning axle, such as

indicated in Figs. 1, 2 and 3 or in Fig. 4, any suitable means may be employed. Herein said connecting rods 32 are connected at their forward end by a transverse rod 33 and by an inclined transverse rod 34, the rear end 70 whereof is connected to a separate rack mounted in a guide way 34' also connected to the transverse member 28. Meshing with said rack is a pinion 35 secured upon the lower end of the spindle 36 of a separate 75 steering mechanism. By the described construction, when it is desired to impart turning movement to the vehicle, steering movement may first be imparted to a pair of rear wheels through the pinion 35 and spindle 36, 80 the said steering gear being then preferably set in any desired manner. Thereupon steering or turning movement may be imparted to the front wheels 2—2 through the gear 30 and spindle 31, the steering gear for the rear 85 wheel being released at the proper time.

In Fig. 6, I have represented a slightly modified construction. Therein, the leading wheels 2—2 are mounted as indicated in Fig. 5, and steering movement is imparted thereto 90 in substantially the same manner. The rear wheels or, if more than one pair thereof be employed, one of said pairs of rear wheels is connected by sprocket chains 37—37 with a rack mounted in a guide way 38 secured 95 to a transverse member 39. Herein said sprocket chains 37 are represented as passed about guiding pulleys or sprocket wheels 40—40. It will, of course, be apparent that the separate steering gears represented in 100 this figure are intended to be employed in the manner indicated with respect to Fig. 5.

In Fig. 7, I have represented the sprocket chains 37—37 as connected to the forward axle 41 of the rear wheels which herein are 105 represented at 42—42, 43—43, the said axle being mounted for turning movement in the manner more fully represented in Figs. 2 and 3. The sprocket chains 37—37 are represented as passed about guiding pulleys or 110 sprocket wheels 40—40 and as connected with the adjacent ends of a rack mounted in a guide way 38, with which rack the gear 35 meshes in the manner more fully described in connection with Figs. 5 and 6. 115 In such form of the invention the wheels 43—43 may be driven in any suitable manner.

If desired and preferably I connect, as shown most clearly in Fig. 2, the front wheels with the body frame 1 by longitudinally disposed side springs 44 and 45 120 of any suitable construction. The two pairs of rear wheels may also be connected with the body frame in any suitable manner, as, for example, by longitudinally disposed side 125 springs 46.

Having thus described one type or embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and 130



descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims.

5 1. An automobile comprising in combination a body frame composed of opposite, unitary side members of substantially the length of the automobile and transverse connections therefor, a fixed front axle mounted in said frame, a pair of non-driven but  
10 dirigible wheels mounted upon said axle, two axles to the rear of said front axle one of said two rear axles being mounted in both side members of said frame, a pair of driven  
15 wheels mounted upon said axle and a pair of non-driven wheels mounted upon the other of said two rear axles, said other rear axle being mounted in said body frame for movement in a substantially horizontal  
20 plane, a motor supported by the frame, connections therefrom to the first mentioned of said two rear axles, steering means connecting said front wheels and connections between said steering means and said movable  
25 rear axle whereby when steering movement is imparted to the dirigible wheels of the front fixed axle steering movement is imparted to said rear movable axle.

30 2. An automobile comprising in combination a body frame composed of opposite, unitary side members of substantially the length of the automobile and transverse connections therefor, a fixed front axle mounted in said frame, a pair of non-driven wheels  
35 pivoted upon said fixed axle, levers connected to said wheels, steering means connected to said levers, two axles to the rear of said front axle, one of said two rear axles being mounted in both side members of said  
40 frame, a pair of driven wheels mounted upon said axle and a pair of non-driven wheels mounted upon the other of said two rear

axles, said other rear axle being pivoted intermediate its ends in said body frame for swinging movement in a horizontal plane, a  
45 motor supported by the frame, connections therefrom to the first mentioned of said two rear axles and connections between said steering means and said pivoted axle, whereby when steering movement is im-  
50 parted to the front wheels, steering movement is also imparted to said pivoted axle.

3. An automobile comprising in combination a body frame composed of opposite unitary side members of substantially the length  
55 of the automobile, and transverse connections therefrom, a fixed front axle mounted in said frame, a pair of non-driven but dirigible wheels mounted upon said axle, two axles to the rear of said front axle, the  
60 rearmost of said two rear axles being mounted in both side members of said frame, a pair of wheels mounted upon said rearmost axle, a motor and motor shaft, chain connections from said motor shaft to said rear-  
65 most axle, said other rear axle being mounted in said body frame for movement in a substantially horizontal plane, a pair of non-driven wheels mounted upon said last mentioned axle, steering means connecting said  
70 front wheels, and connections between said steering means and said movable rear axle, whereby when steering movement is imparted to the dirigible wheels of the front fixed axle steering movement is imparted to  
75 said rear movable axle.

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

ISAAC E. PALMER.

Witnesses:

FRED. E. FOWLER,  
GEO. C. HAINS.