

I. E. PALMER.
 TRACKLESS POWER DRIVEN VEHICLE.
 APPLICATION FILED NOV. 13, 1908.

939,077.

Patented Nov. 2, 1909.

5 SHEETS—SHEET 1.

Fig. 3.

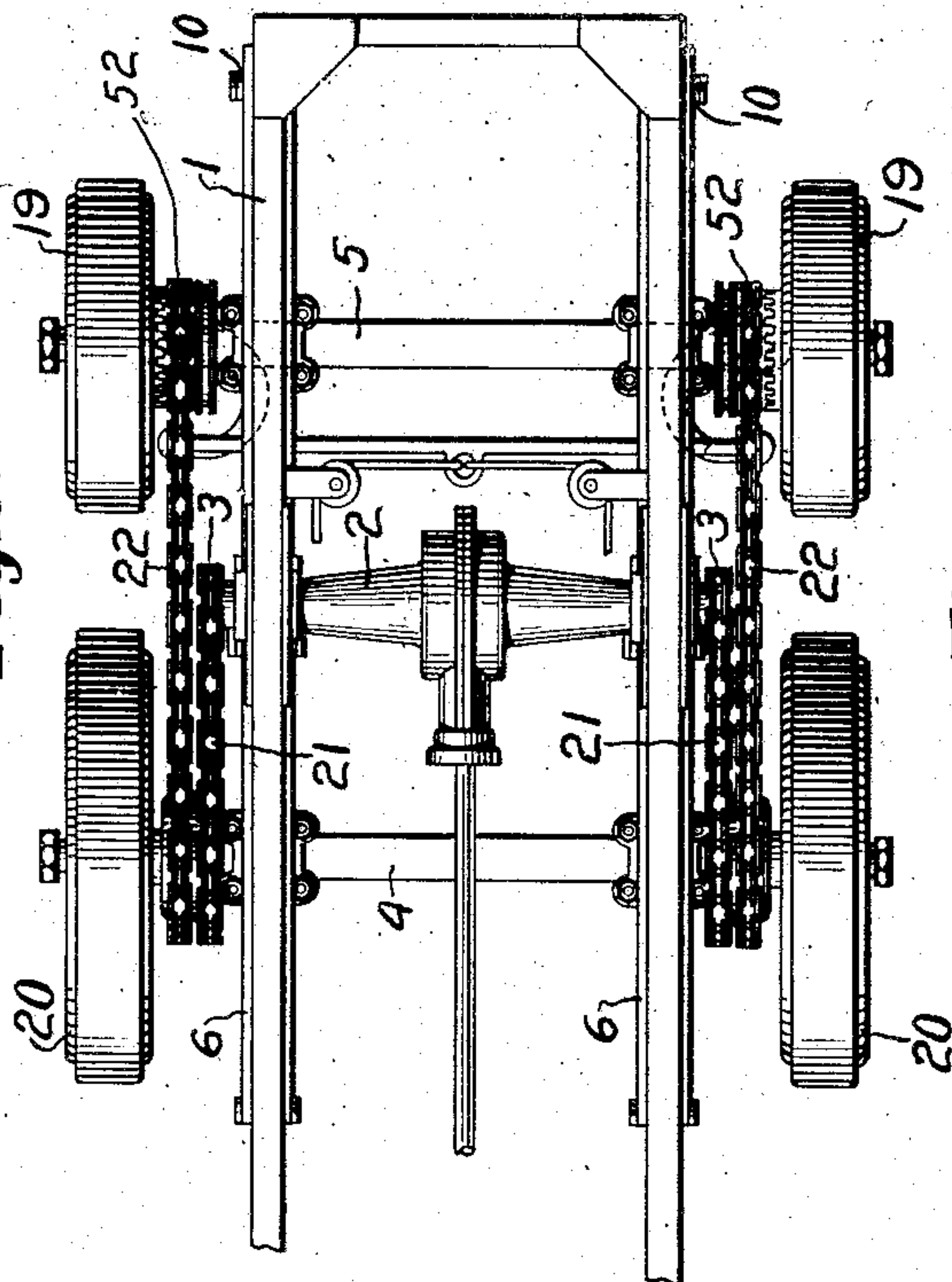


Fig. 4.

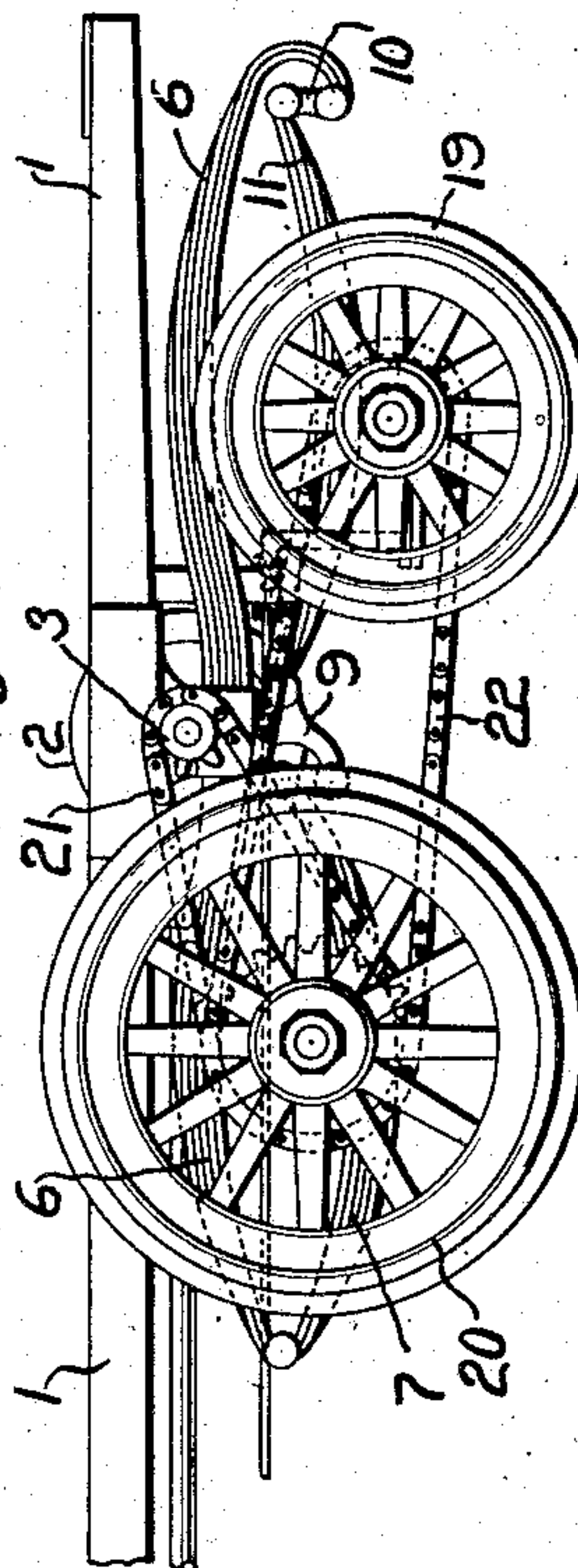


Fig. 1.

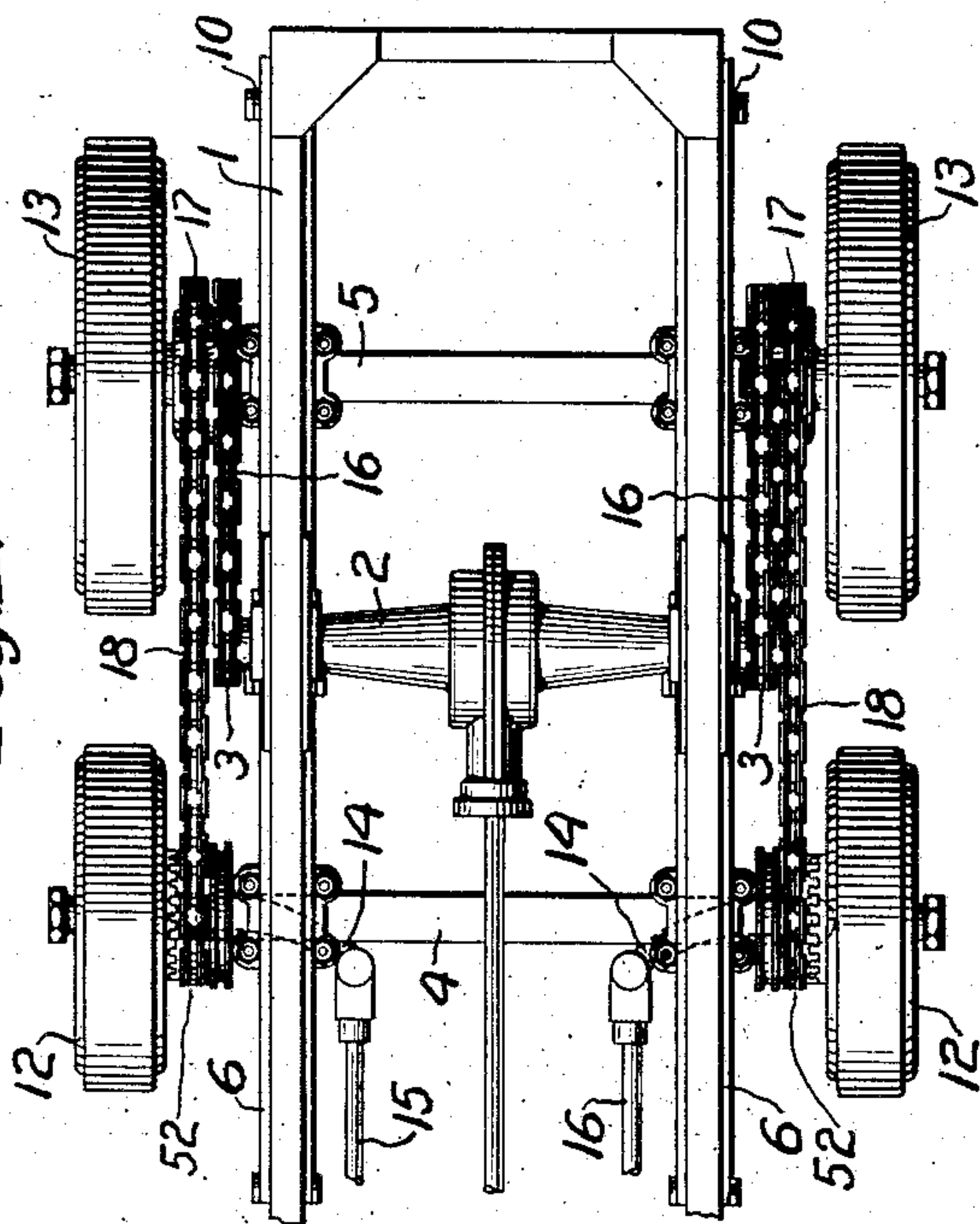
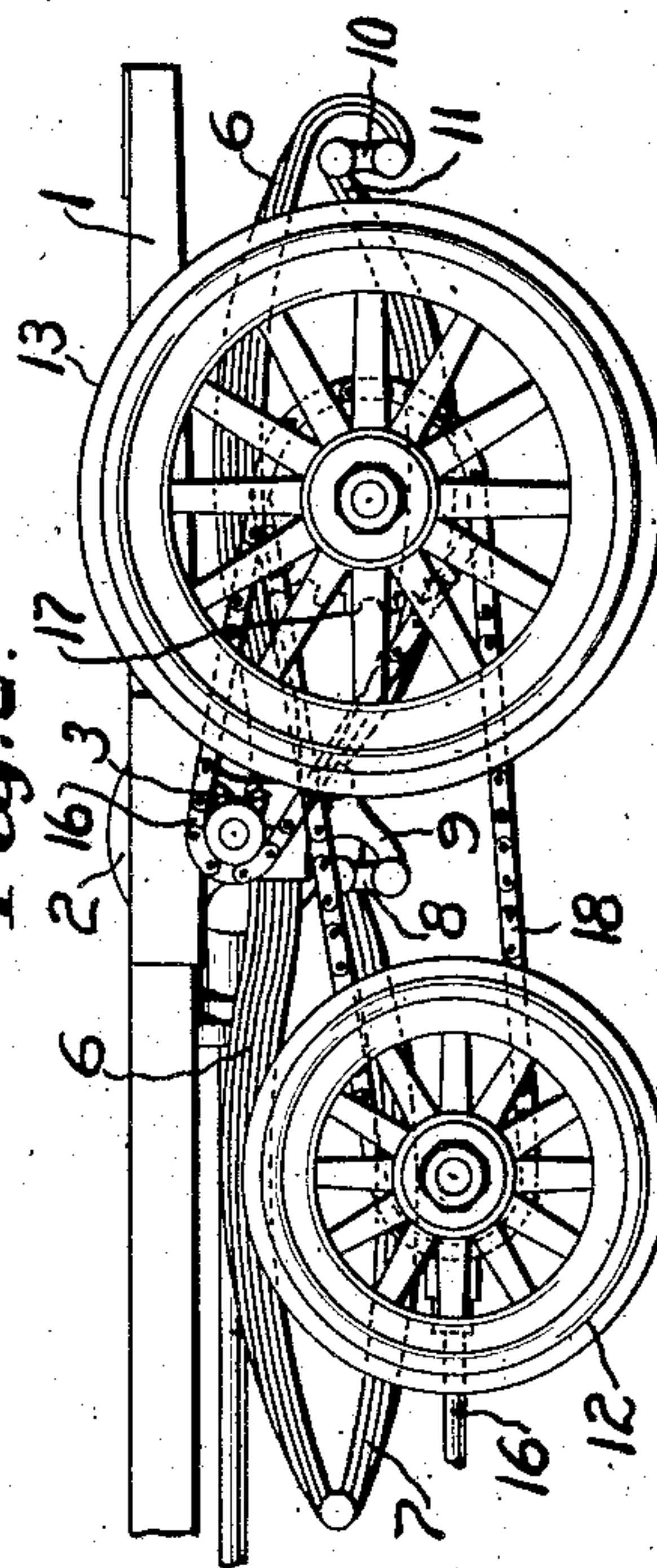


Fig. 2.



Witnesses:
 Edwin T. Luce
 William C. Glass

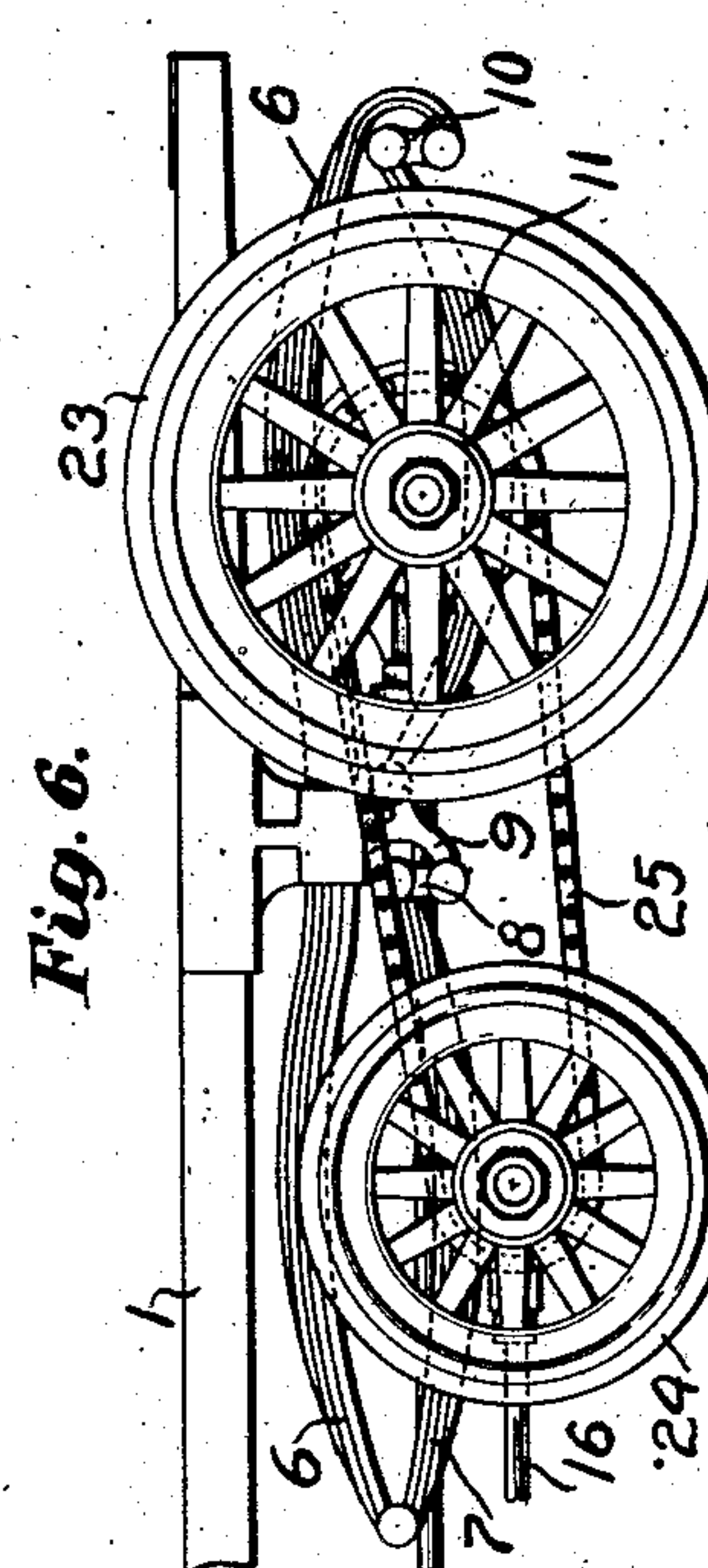
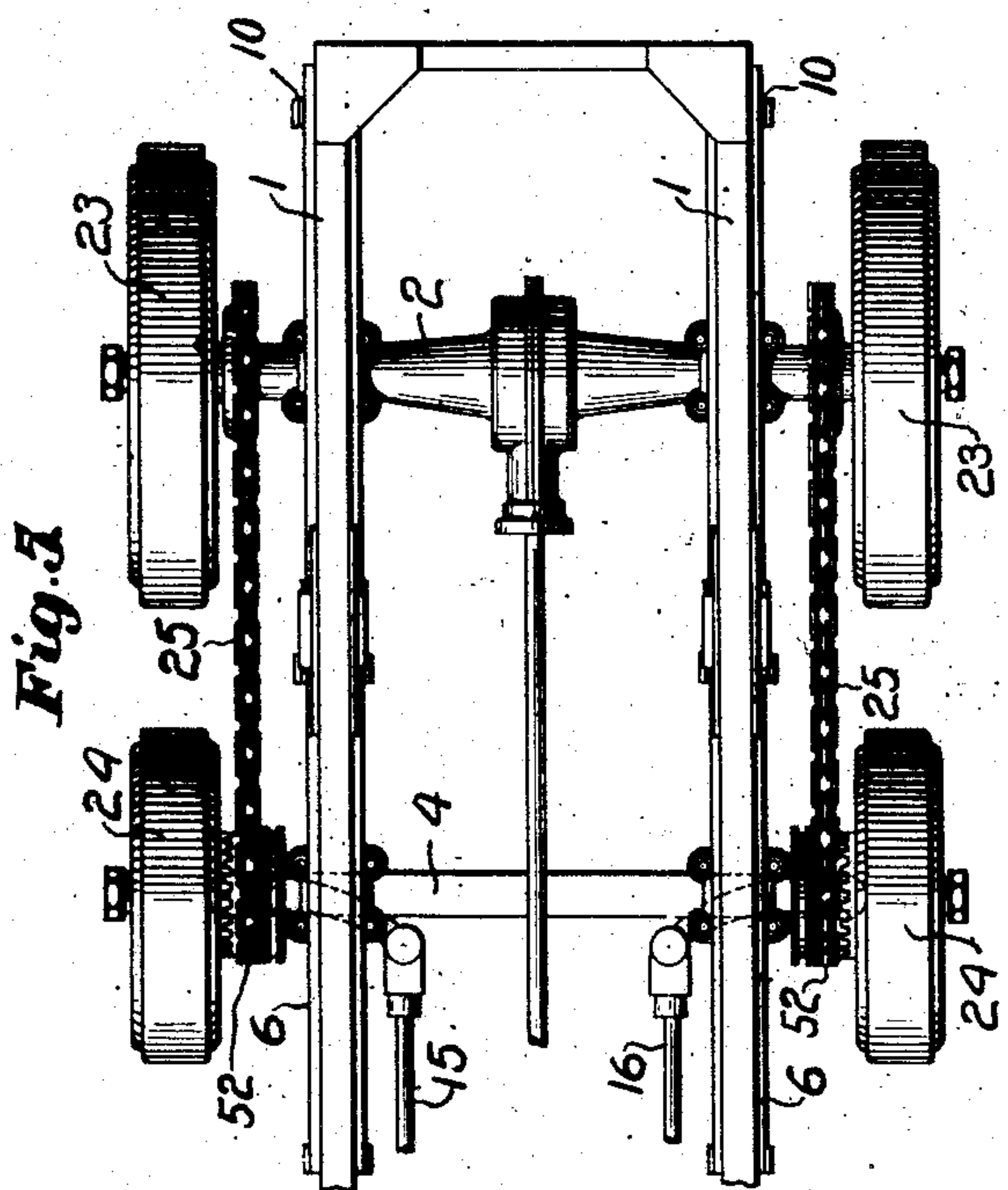
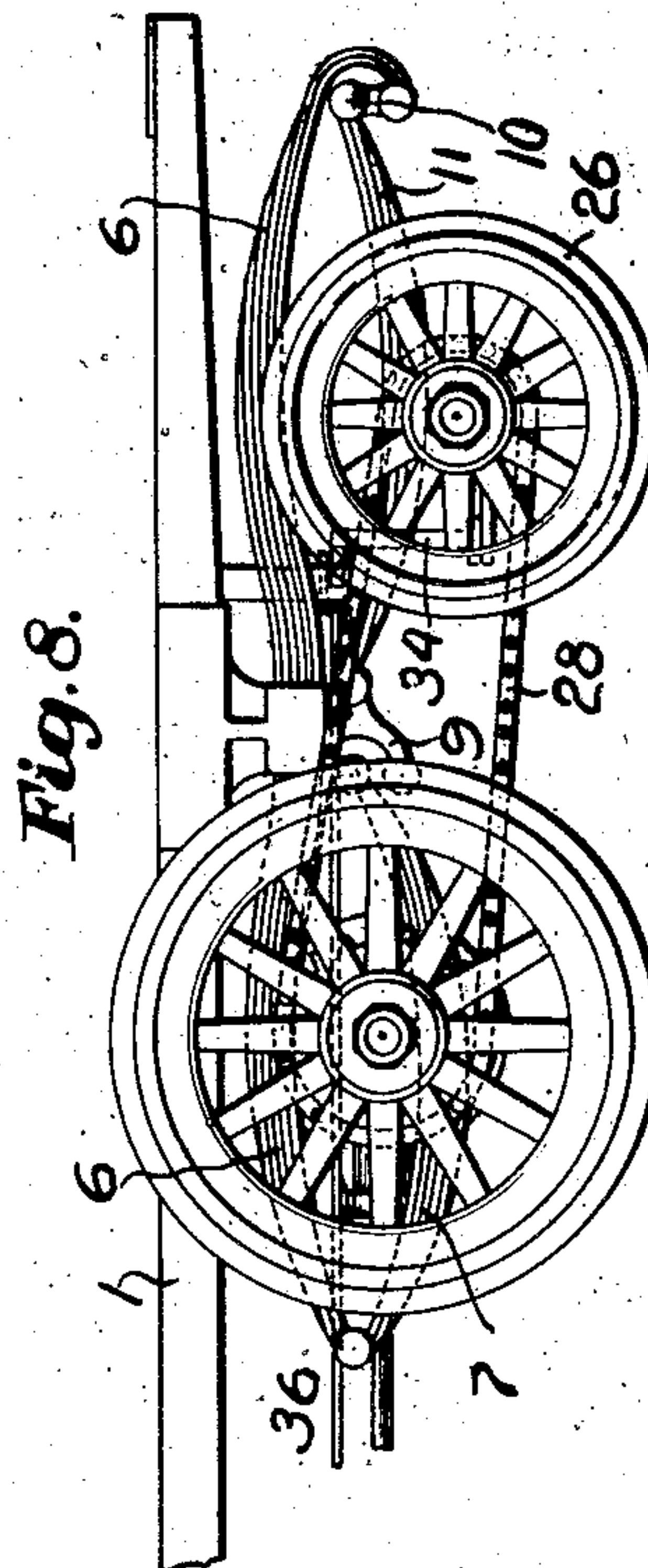
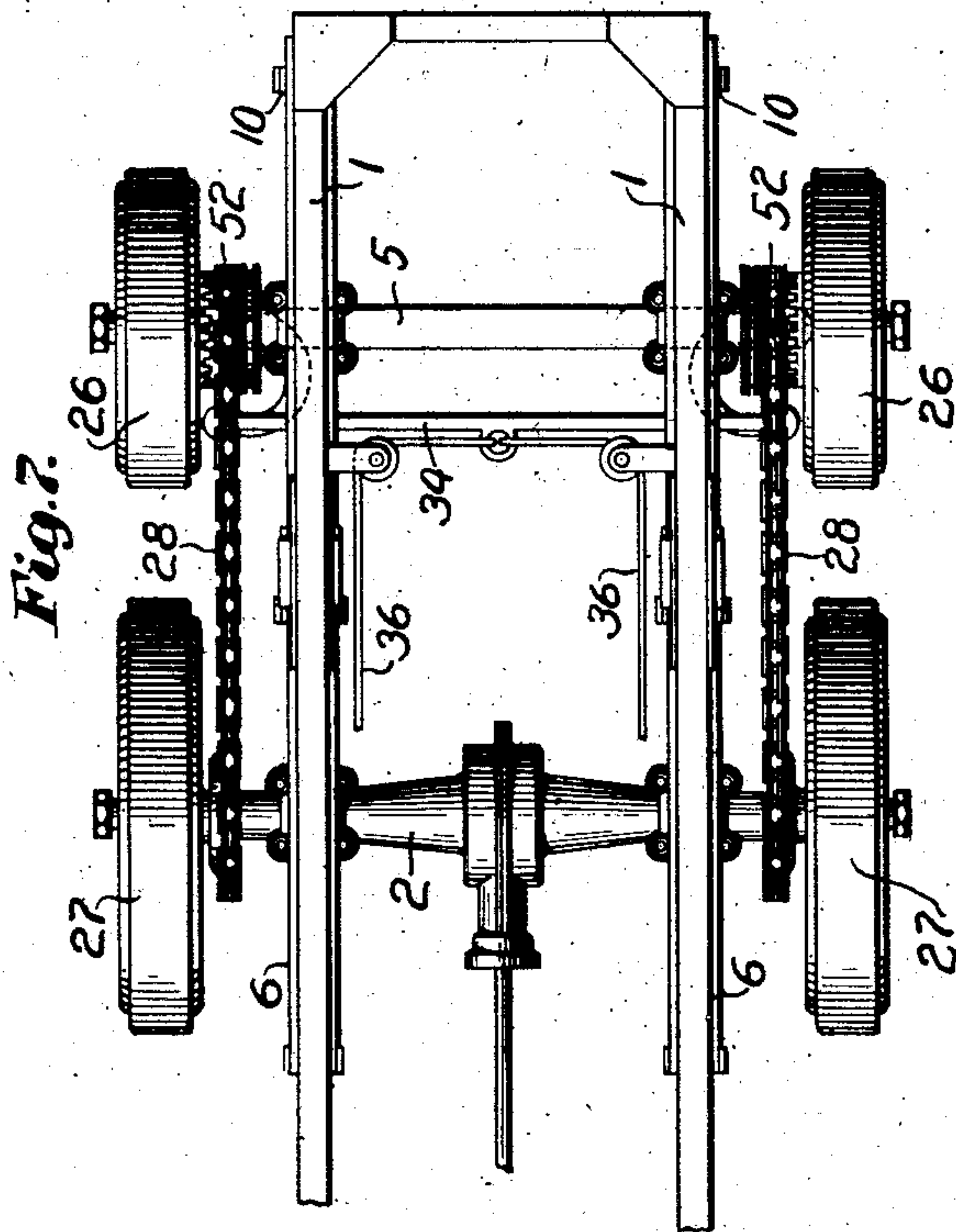
Inventor:
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5 SHEETS—SHEET 2



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 5 SHEETS—SHEET 3.

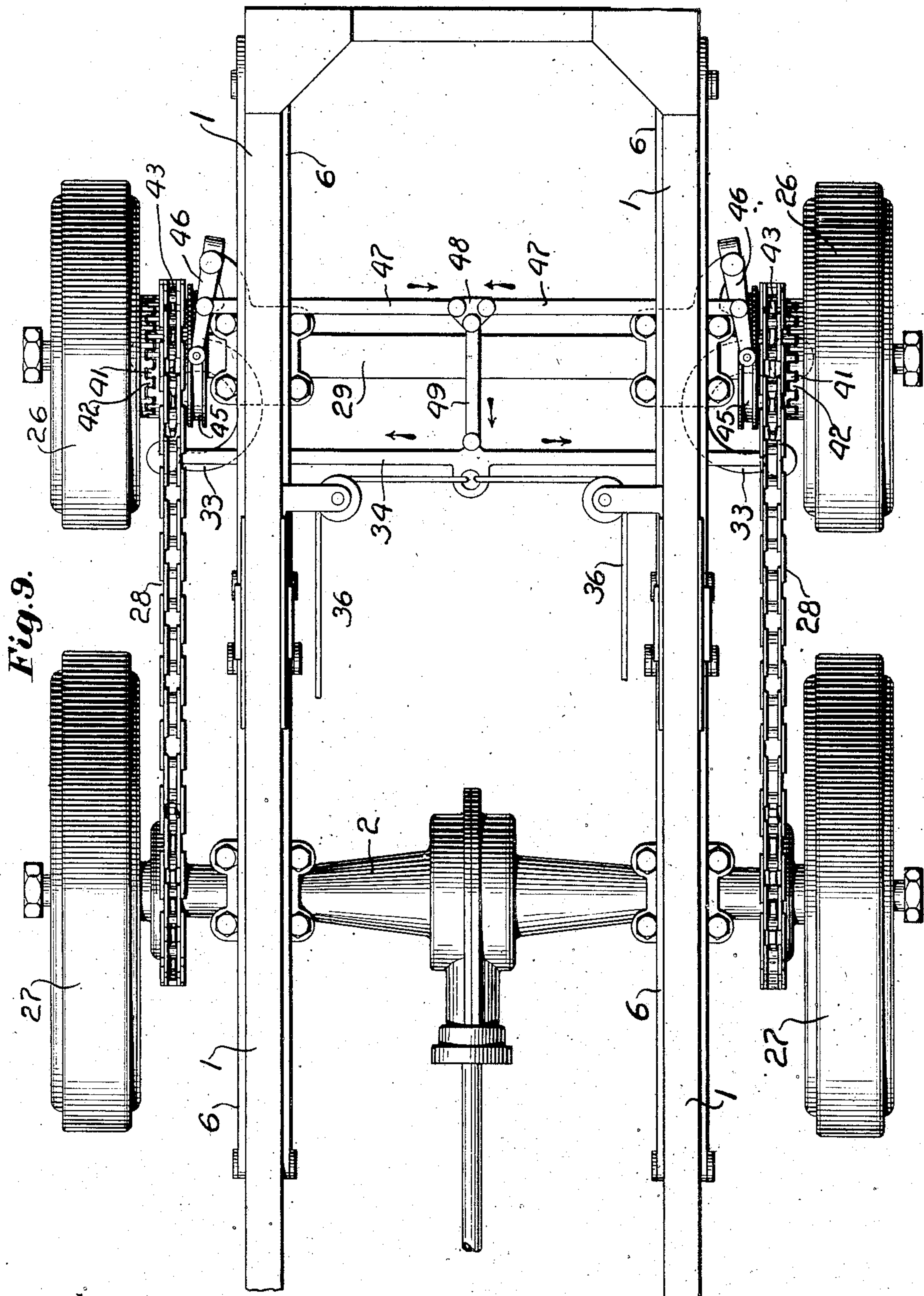


Fig. 9.

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 Edwin T. Luce
 William C. Glass.

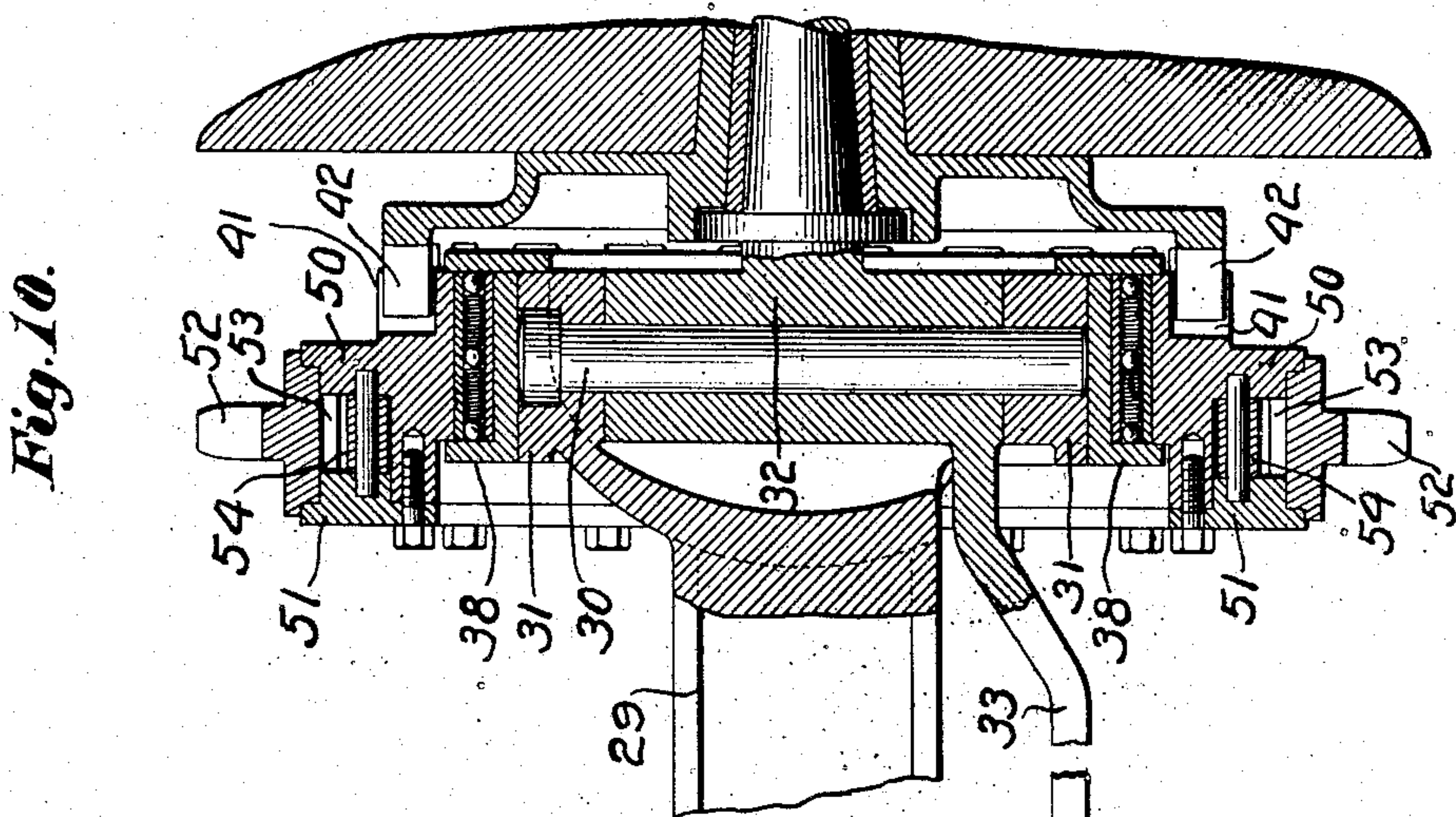
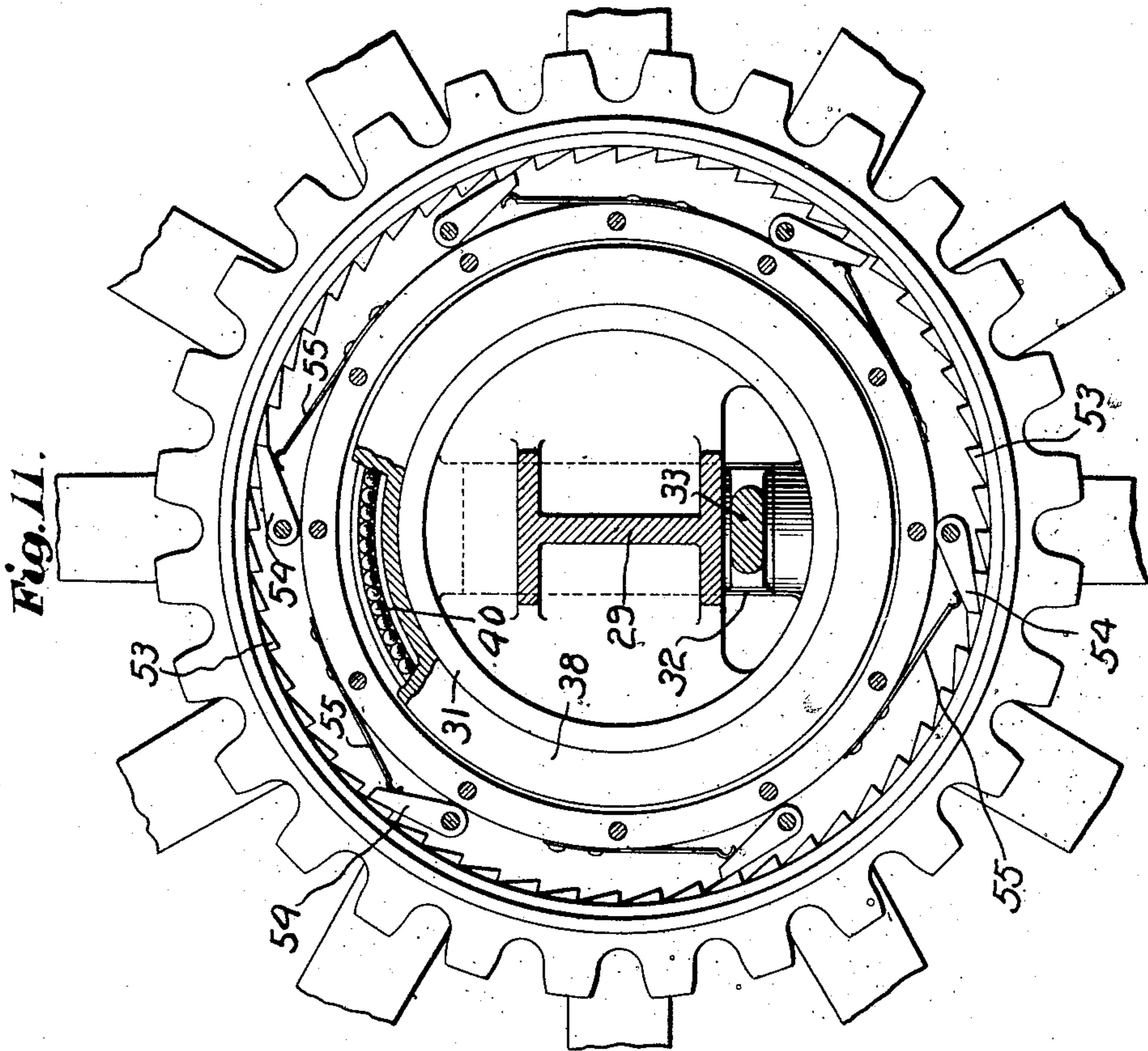
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6 SHEETS—SHEET 4.



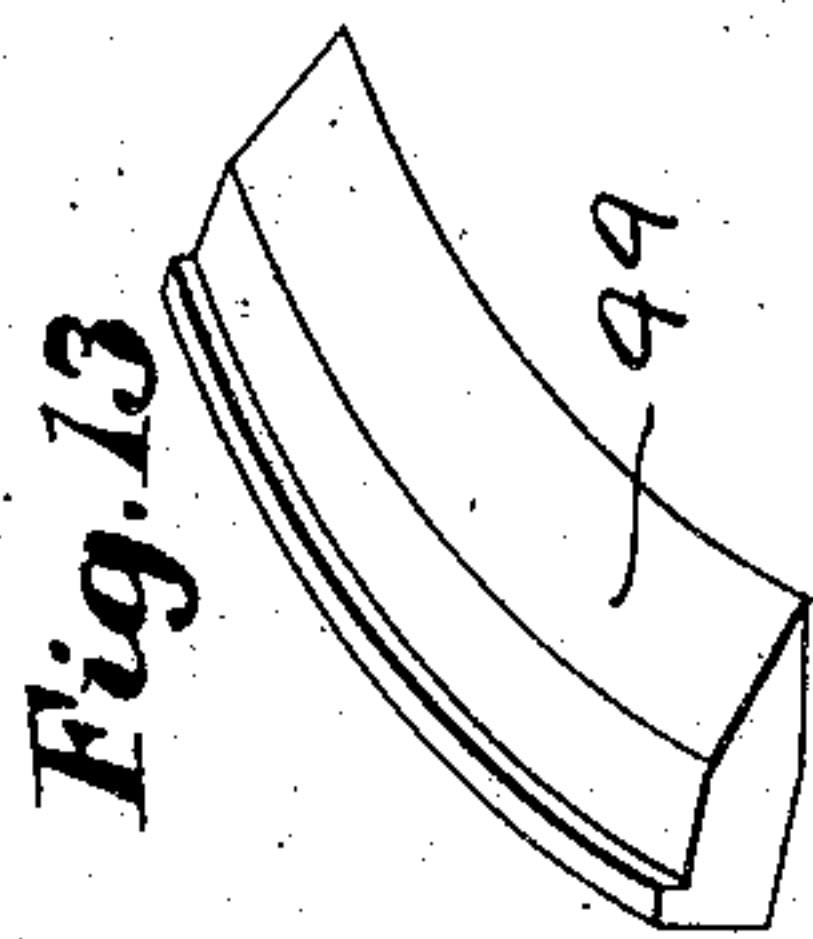
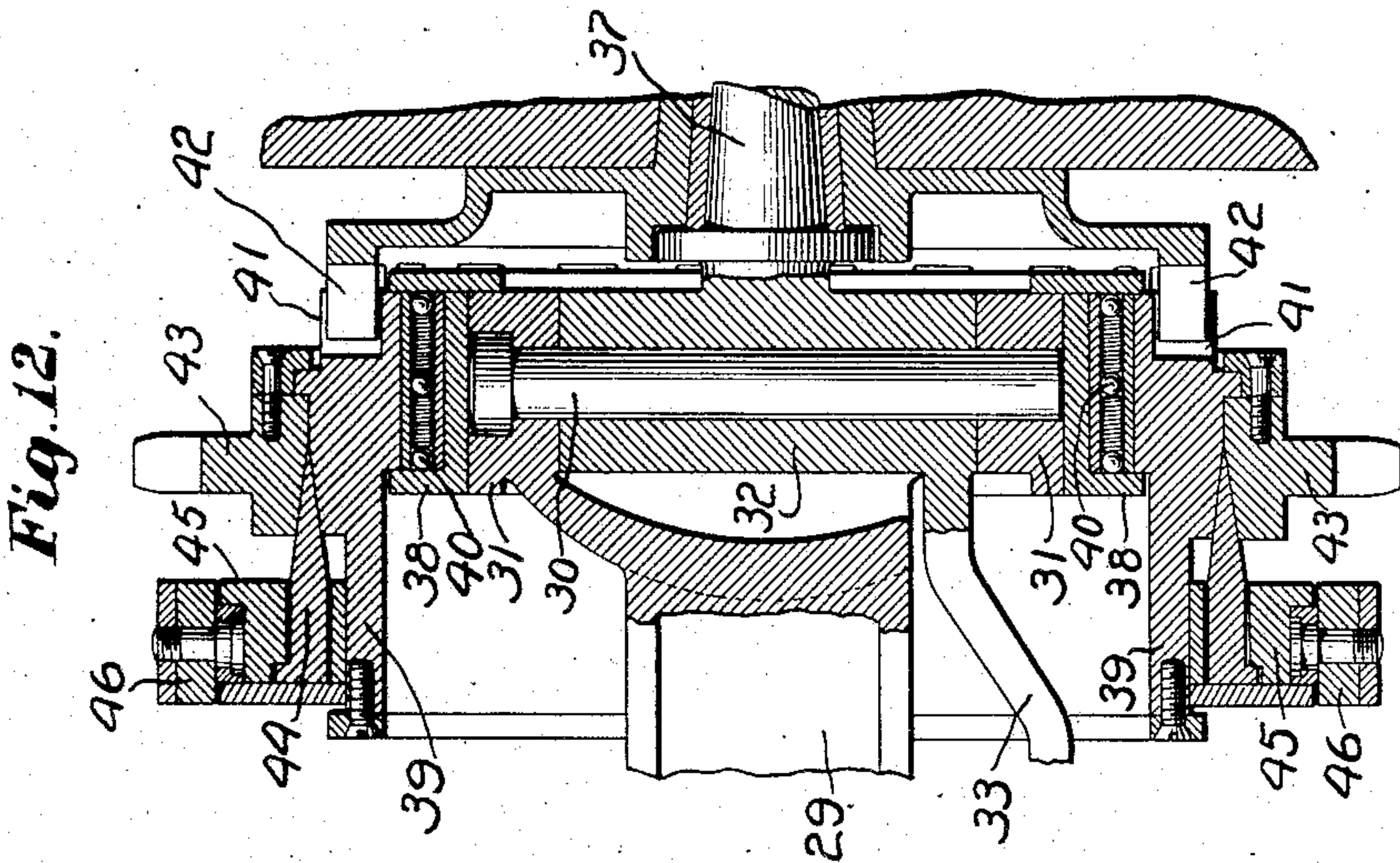
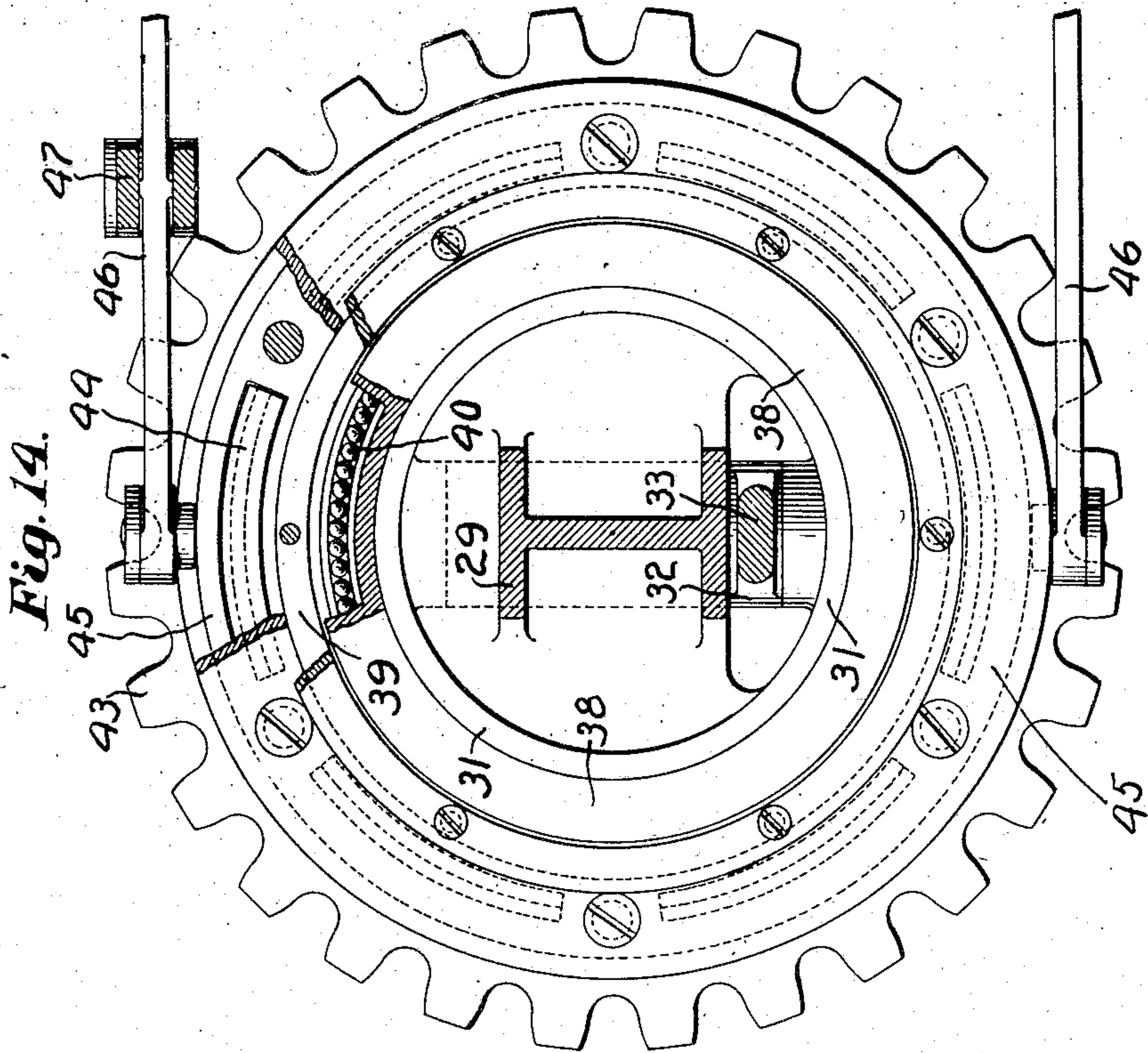
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 6 SHEETS—SHEET 5.



Witnesses:
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 William B. Glass

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UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

TRACKLESS POWER-DRIVEN VEHICLE.

939,077.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed November 13, 1908. Serial No. 462,362.

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 the individual wheels, and to provide improved wheel deflecting mechanism.

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

Figure 1 is a plan view of the rear portion of an automobile having one form of my invention applied thereto; Fig. 2 is a side elevation of the construction shown in Fig. 1; Figs. 3 and 4 are views similar to Figs. 1 and 2 respectively, but showing a slightly modified form of my invention; Figs. 5 and 6 and Figs. 7 and 8 are views similar to Figs. 1 and 2 respectively, but showing further forms of my invention; Fig. 9 is a plan view upon an enlarged scale of an automobile embodying my invention and showing more clearly the clutches for the deflectable wheels and operating means therefor; Fig. 10 is a central, vertical section taken through the hub section of one of the deflectable wheels; Fig. 11 is a view in vertical section of the construction shown in Fig. 10; Fig. 12 is a view similar to Fig. 10, but showing a different form of transmitting mechanism between the hub section of a deflectable wheel and the wheel proper; Fig. 13 is a detail of one of the clutching members shown in Fig. 12; and Fig. 14 is a vertical section of the construction shown in Fig. 12.

The type of automobile selected for illustration is one having four rear power driven wheels and any suitable number of front wheels. My invention may, however, be embodied in other forms. The forward portion of the automobile may, if desired, be provided with two pairs of wheels supported in any suitable way.

Referring first to the form of the invention shown in Figs. 1 and 2, the body frame of the vehicle is represented at 1, it being of any suitable form and construction. Preferably journaled in the rear portion thereof is a suitable driving member, herein represented as a divided axle 2 receiving power from any suitable source and having upon the ends of the driven member thereof sprocket wheels 3—3. The body frame is provided with axles 4, 5 connected in any suitable manner thereto.

In the present form of my invention, I have represented main side springs 6—6 connected at substantially mid-length to the body vehicle. To each end of each main spring is connected in any suitable manner a supplemental spring.

As shown more clearly in Fig. 2, the left hand end of each spring 6 has pivoted thereto a supplemental spring 7, the inner end of which is pivotally connected, as by a link 8, to a bracket 9 depending from the body frame. The opposite or right hand end of the main spring 6 is pivotally connected as by a link 10 to one end of a supplemental spring 11, the opposite end of which is directly but pivotally connected to the bracket 9. The axles 4 and 5 are directly connected to and supported by the supplemental springs 7—7, 11—11 in any desired manner. Upon said axles 4 and 5 are suitably mounted the two pairs of wheels 12—12 and 13—13, one pair of wheels, and in this form of the invention the wheels 12—12, being mounted for lateral deflection in any suitable manner, as for example by the employment of two sets of interengaging teeth, such as shown in my Patent No. 889,960, June 9, 1908, or by the employment of a rocking ring, such as shown in my application Serial No. 448,129, filed August 12, 1908. The wheels 12 and 12 are positively deflected in any suitable manner, as by connecting them by levers 14—14 and steering rods 15—15 with the steering mechanism for the front wheels.

As will be more fully described hereinafter, the deflectable wheels are preferably provided with means permitting them to travel when deflected at a speed differing from that of the other pair of driven wheels.

As herein shown, the wheels 13—13 are directly driven from the axle 2 by means of sprocket chains 16—16 mounted upon the sprocket gears 3—3 upon the axle 2 and the

sprocket gears upon the wheels 13—13. The deflectable wheels 12—12 are directly driven from the wheels 13—13 by suitable sprocket chains 18—18.

5 The construction shown in Figs. 3 and 4 is similar to that shown in Figs. 1 and 2, excepting that the rear wheels 19—19 are shown as deflectable and the front wheels 20—20 as non-deflectable. In this instance, 10 the wheels 20, 20 are directly driven from the driving axle 2 by means of sprocket chains 21—21 and the deflectable wheels 19 are directly driven from the wheels 20 by sprocket chains 22—22. The wheels 19—19 15 are provided with suitable connections to the steering mechanism, thereby positively to deflect them when desired.

In Figs. 5 and 6, the non-deflectable wheels 23—23 are mounted upon the driving axle 20 2 and the deflectable wheels 24—24 are driven directly therefrom by the sprocket chains 25—25, the said wheels 24—24 being connected to the steering mechanism in any suitable manner.

25 The construction shown in Figs. 7 and 8 differs from that shown in Figs. 5 and 6 in that the deflectable wheels 26—26 are arranged to the rear of the non-deflectable wheels 27—27 which are mounted upon the 30 driving axle 2. The wheels 26—26 are driven directly from the wheels 27—27 by means of the sprocket chains 28—28. The said wheels 26—26 are connected to the steering mechanism in any suitable manner.

35 The spring support for the wheels in the forms of my invention shown in Figs. 3 to 8 inclusive is the same as that shown in Figs. 1 and 2, but any other suitable form of spring support may be employed.

40 It will be observed that in the several types of my invention herein illustrated, the deflectable wheels are driven directly from the non-deflectable wheels and at the same surface speed. When the pivotally 45 mounted wheels are deflected so as to travel upon a curve they travel at an increased speed by reason of the fact that their arc of movement is longer than the line upon which the non-deflectable wheels travel in 50 the same length of time. While I may, in certain types of my invention, employ mechanism positively to drive the wheels when deflected at a different and preferably a greater rate of speed than that at which 55 they travel when non-deflectable, preferably I provide suitable means for disconnecting the wheels when deflected from the driving shaft, thus permitting them when deflected to travel idly at an increased rate of speed.

60 It is apparent that this result may be accomplished in various ways. Preferably I employ mechanism connected with and operated by the steering mechanism so as to disconnect the deflectable wheels from the 65 driving mechanism upon deflection thereof.

In Fig. 9, I have represented upon an enlarged scale and more specifically one form of means for deflecting one of the pairs of wheels from the steering mechanism. Although in Fig. 9 I have represented 70 the arrangement of wheels and driving connections shown in Figs. 7 and 8, it is to be understood that the deflecting means shown in said Fig. 9 may be employed in connection with any of the arrangements of wheels 75 and driving means therefor shown in Figs. 1 to 8 inclusive, said Fig. 7 being selected merely as a single embodiment for purposes of illustration. In said Fig. 9, each of said wheels 26—26 is pivotally mounted upon an 80 axle 29 in any suitable manner, as by means of a vertical pintle 30 (see Fig. 12) fast in extensions 31—31 from the axle.

Surrounding the pintle is a sleeve 32 from which extends an arm 33, said arms 33 being 85 connected by a cross link 34, to which are connected cords or chains 36—36 suitably connected to the steering mechanism. It will be apparent that when pull is imparted to either cord or chain 36, the wheels 90 26—26 are laterally deflected in the same direction. From each sleeve 32 extends an axle spindle 37. The extensions 31—31 wherein the pintle 30 is mounted have fast thereon a bearing ring 38 upon which is 95 mounted for free rotation a hub section 39, ball or other friction reducing bearings 40 being interposed if desired between the bearing ring and hub section. The hub section 39 is provided with a suitable number 100 of circumferentially arranged teeth 41 with which engages a series of teeth 42 extending from the traction part of the wheel, the construction being such as to permit relative or in and out movement of the teeth 41—42 105 upon deflecting movement of the wheel. Loose upon each hub section is a sprocket gear 43 connected by the sprocket chain 28 previously described with the corresponding sprocket gear upon the wheel 27. 110

I interpose suitable mechanism between the sprocket gear 43 and the hub section 39, whereby the wheels 26—26 are positively 115 driven when traveling in a straight path, but permitting them to travel idly, but at an increased speed with respect to the wheels 27—27 when upon a curved path. While any suitable mechanism may be employed for the purpose, I have herein represented a clutch composed of a suitable number of 120 annularly arranged wedge sections 44 mounted upon a ring 45 and adapted to be moved into such frictional engagement with the sprocket gear 43 and hub section 39 as to effect the driving of the latter from the 125 former.

Each ring 45 may be shifted laterally in any suitable manner to render the clutch effective or non-effective. Preferably, however, the operating means is connected to the 130

steering mechanism so that upon operation of the steering mechanism to deflect the wheels 26—26 in a curved path, they are disconnected from the driving mechanism. For this purpose, I have in Fig. 9 shown levers 46—46 suitably pivoted upon brackets extending from the body frame 1 and suitably connected by links 47—47 to an eye piece 48 receiving in holes therein said links 47—47 and also a link 49 pivotally connected at its opposite end to the cross bar 34. Normally or when the clutches are in operating position, the link 49 occupies the position shown in Fig. 9, being parallel with the sides of the body frame. It will be apparent that upon movement of the cross bar 34 in either direction the forward end of the link 49 is moved to the right or to the left, and that the link is moved bodily forward, moving with it the eye piece 48 and the links 47—47, which are moved inwardly toward each other sufficiently to disengage the clutches. When the link 49 is restored to its central position indicated in Fig. 9, the eye piece 48 and links 47 are restored to their position there shown and the clutches are again engaged.

Instead of employing a clutch or other transmitting mechanism intermediate the hub section and the sprocket or other driving gear, that is operated by the steering mechanism, I may employ transmitting or clutch mechanism automatically rendered effective, but permitting an increase of speed of the deflected wheels when traveling in a curve. One form of such construction is indicated in Figs. 10 and 11. In said figures, the hub section 50 is represented as having bolted thereto a ring 51 upon which and said hub section is loosely mounted the sprocket gear 52, interiorly provided with an annular series of ratchet teeth 53. Pivotally mounted upon the hub section 50 and ring 51 are a suitable number of pawls 54 spring pressed if desired into driving engagement with the ratchet teeth. Centrifugal action alone may be relied upon to throw the pawls into driving relation with the ratchet teeth, but if desired such action may be supplemented by the springs 55.

Viewing Figs. 10 and 11, it will be apparent that the ratchet teeth 53 are carried by the driving member, herein the sprocket wheel 52. When the vehicle wheels are traveling in a straight path, the driven member or hub section 50 carrying the pawls 54 is driven by and at the same speed as the driving member or sprocket gear 52. When, however, the vehicle wheels are deflected by the steering mechanism so as to travel in a curved path the normally driven member or hub section 50 may travel at a speed greater than that of the driving member 52, as the pawls 54 may advance upon the ratchet teeth 53.

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

1. Running gear for trackless, power driven vehicles comprising in combination a body frame, a driving shaft journaled in said frame, four vehicle wheels mounted upon the rear part of said body frame, connections from the driving shaft for driving all of said four rear wheels, said four wheels being arranged in pairs and one of said pairs of wheels being dirigible, and means simultaneously and automatically to disconnect said pair of dirigible wheels from driving relation to said driving shaft upon lateral deflection thereof by the steering mechanism while leaving the other pair of rear wheels in driving relation to said driving shaft, so that said dirigible wheels may travel when disconnected at a differential speed with respect to said other pair of rear wheels and the vehicle be driven by said other pair of rear wheels.

2. Running gear for trackless, power driven vehicles comprising in combination a body frame, a driving shaft journaled in said frame, four vehicle wheels mounted upon the rear part of said body frame, connections from the driving shaft for driving all of said four rear wheels, said four wheels being arranged in pairs and at least one of said pairs of wheels being dirigible, and means operated by the steering mechanism to disconnect at the same time, both wheels of said pair of said dirigible wheels from driving relation to the driving shaft upon lateral deflection of the vehicle, while leaving the other pair of rear wheels in driving relation to said driving shaft whereby said dirigible wheels may travel when disconnected at a differential speed with respect to the other rear wheels and the vehicle be driven by said other pair of rear wheels.

3. Running gear for trackless, power driven vehicles comprising in combination a body frame, a driving shaft journaled in said frame, four vehicle wheels mounted upon the rear part of said body frame, connections from the driving shaft for driving both pairs of said rear wheels, a driven pair of said rear wheels being dirigible, and means operatively connected to the steering mechanism to disconnect both of said dirigible wheels from driving relation to the driving shaft upon lateral deflection of the vehicle in either direction, while leaving the other pair of rear wheels in driving relation to said driving shaft, whereby the vehicle may be driven by said other pair of rear wheels.

4. Running gear for trackless, power

driven vehicles, comprising in combination a body frame, a driven shaft journaled in said frame, four vehicle wheels mounted upon the rear part of said body frame, connections
5 from the driving shaft for driving all of said four rear wheels, said wheels being arranged in pairs and at least one of said pairs of wheels being dirigible, clutches connected to said dirigible wheels and means opera-
10 tively connected to the steering mechanism simultaneously to disconnect said clutches upon lateral deflection of the vehicle while leaving the other pair of rear wheels in driving relation to said driving shaft, whereby
15 the vehicle is driven by said other pair of rear wheels.

5. Running gear for trackless, power driven vehicles comprising in combination a body frame, a driving shaft journaled in
20 said frame, a pair of driven dirigible and another pair of driven rear vehicle wheels connected to said shaft, and means operatively connected to the steering mechanism and to said dirigible wheels, and adapted simultaneously to disconnect both of said
25 dirigible wheels from driving relation to said driving shaft upon lateral deflection of

the vehicle while leaving the other pair of rear wheels in driving relation to said driving shaft, whereby the vehicle is driven by
30 said other pair of rear wheels.

6. Running gear for trackless, power driven vehicles comprising in combination a body frame, a driving shaft journaled in
35 said frame, a pair of driven dirigible and another pair of driven rear vehicle wheels connected to said shaft, and means operatively connected to the steering mechanism and to said dirigible wheels, and adapted to disconnect both of said dirigible wheels from
40 driving relation to said driving shaft upon lateral deflection of the vehicle in either direction, while leaving the other pair of rear wheels in driving relation to said driving shaft, whereby the vehicle may be driven by
45 said other pair of rear wheels.

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,
REUBEN MYRON BURR.