

No. 631,627.

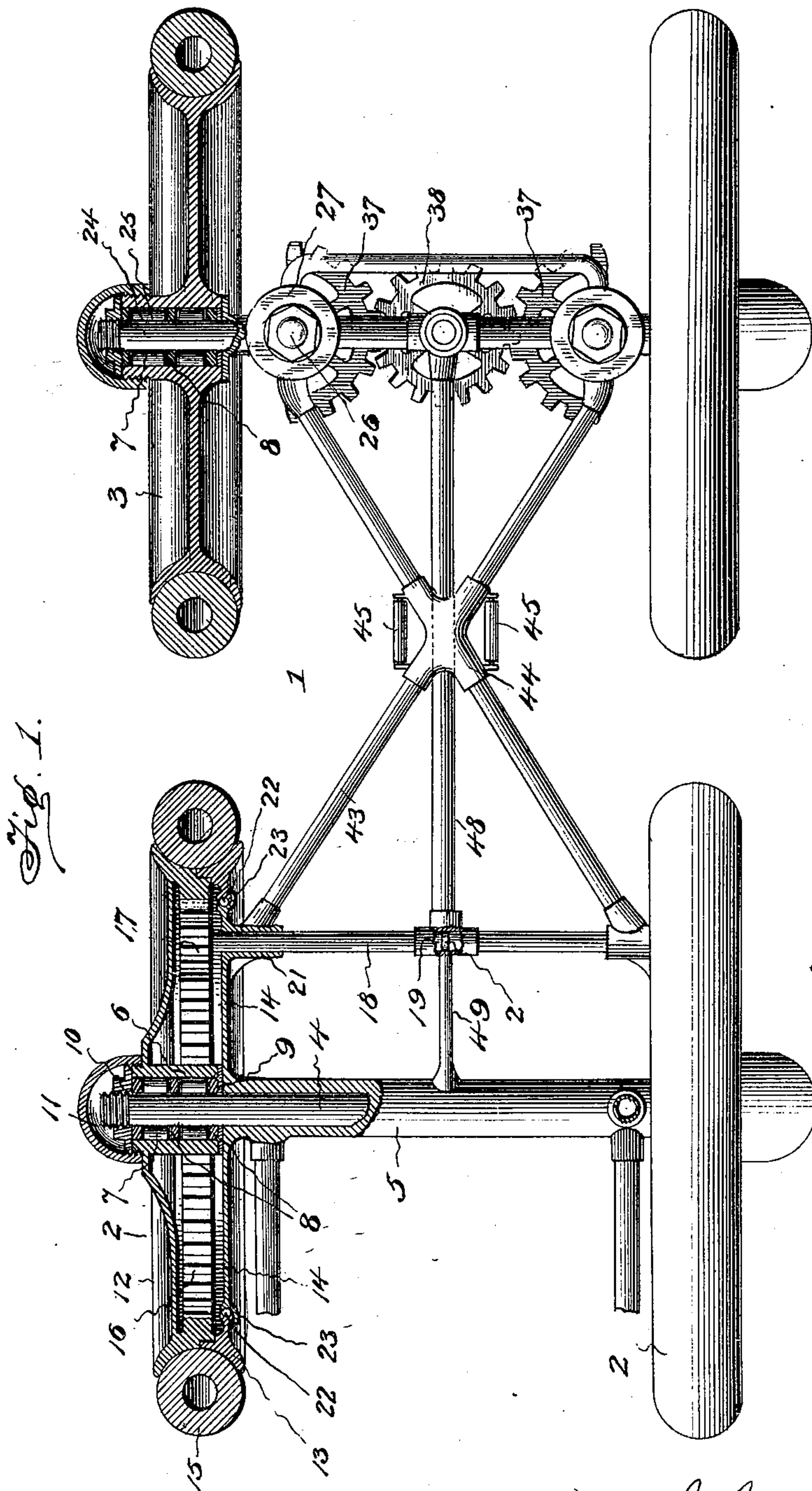
Patented Aug. 22, 1899.

J. W. EISENHUTH.  
RUNNING GEAR FOR MOTOR VEHICLES.

(Application filed Mar. 11, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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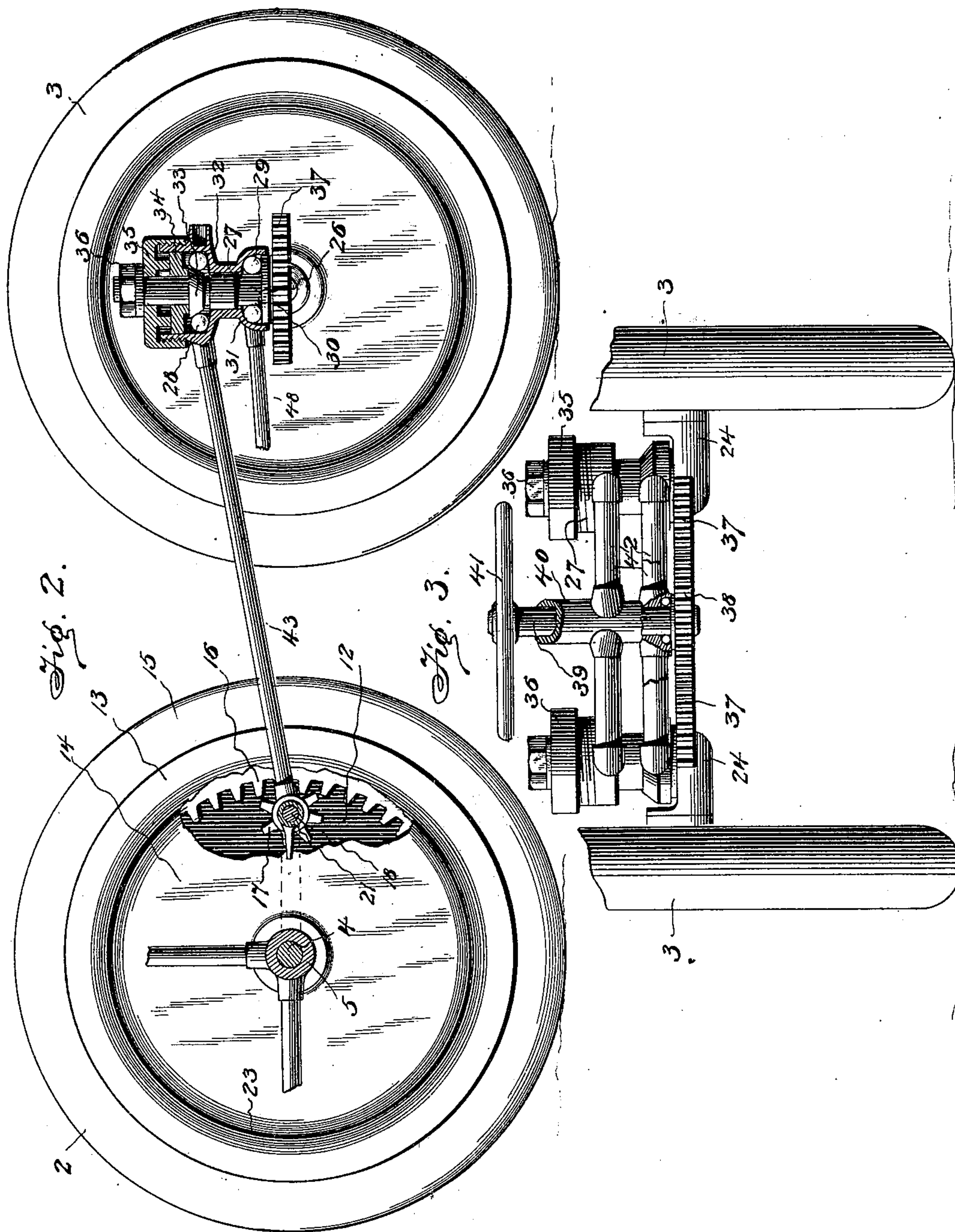
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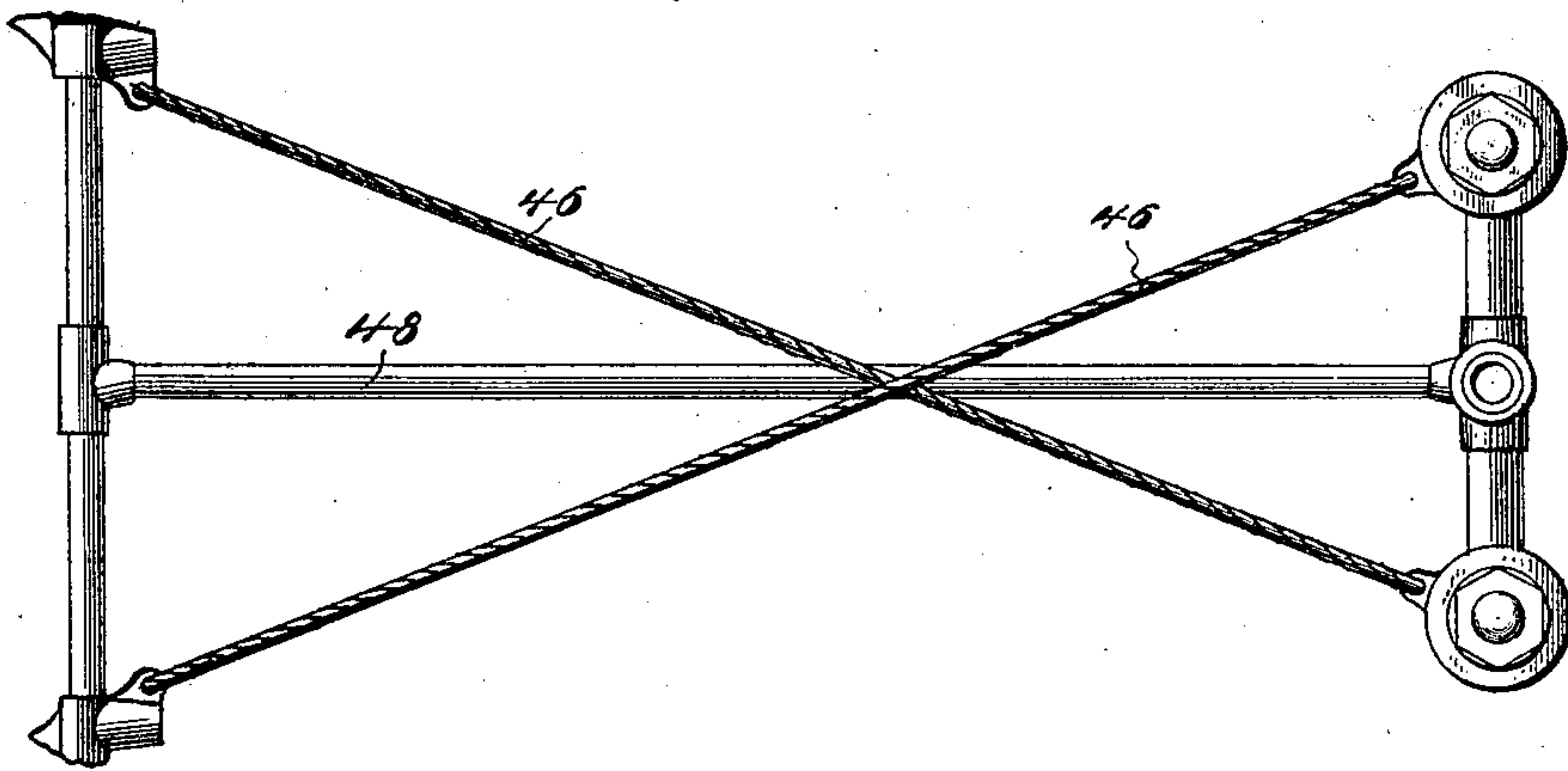
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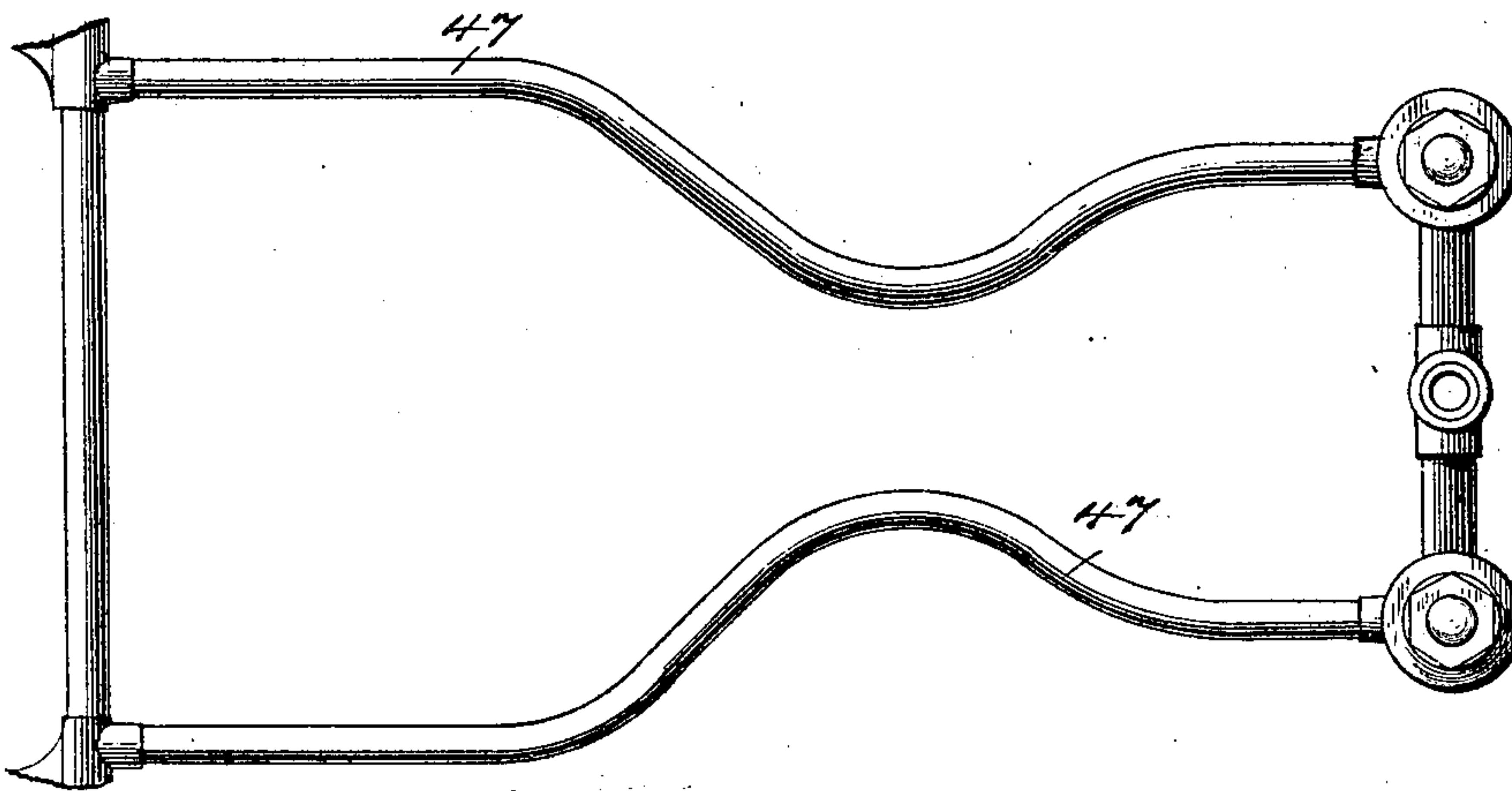
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*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

JOHN WASHINGTON EISENHUTH, OF NEW YORK, N. Y., ASSIGNOR TO ELLA V. EISENHUTH, OF SAME PLACE.

## RUNNING-GEAR FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 631,627, dated August 22, 1899.

Application filed March 11, 1899. Serial No. 708,755. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WASHINGTON EISENHUTH, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Running-Gears for Motor-Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in running-gears for motor-vehicles; and it consists in a running-gear comprising front guide-wheels and rear wheels, one or both of which may be employed for propelling the vehicle, the propelling-wheels being provided with internal gearing, a pinion for engaging said internal gearing and mounted upon a suitable shaft, whereby it may be connected with any suitable means of propulsion, the construction being such that dust or dirt is excluded from the gearing.

It also consists in a running-gear comprising drive-wheels and front guiding-wheels, the said guiding-wheels being mounted upon independent shafts, segmental gears secured to each of the said shafts, and intermediate connecting-gearings provided with hand operating means for moving the segmental gears simultaneously to turn the guiding-wheels.

It also consists in certain other constructions, combinations, and arrangements of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a top plan view of my improved motor-vehicle running-gear, portions of the same being shown in section to better reveal the construction of the parts. Fig. 2 represents a longitudinal vertical section through the said running-gear upon a line passing through one of the steering-heads. Fig. 3 represents a front elevation of the steering apparatus. Fig. 4 represents a top plan view of a portion of the said running-gear, illustrating a different means for bracing the framework thereof; and Fig. 5 represents a similar view showing the manner of strengthening the said frame when it is designed for use upon heavy trucks.

1 in the drawings represents my improved

motor-vehicle running-gear, 2 the rear wheels thereof, and 3 the front or steering wheels.

The rear axle 4 is mounted in a sleeve, as 55 5, forming a part of the frame of the vehicle. The axle 4 projects beyond the sleeve 5 at each end thereof and carries the rear wheels 2 of the vehicle. The rear wheels 2 are preferably formed with inwardly-extending hubs, 60 as 6, between which and the axle 4 are interposed roller-bearings, as 7. Antifriction-washers, as 8 8, are interposed between the ends of the rollers in the said bearing, and an antifriction-washer, as 9, is interposed between the hub 6 and the end of the sleeve 5. 65 The hub 6 is held in position upon the axle 4 by means of a nut, as 10, engaging suitable screw-threads formed upon the ends of the axle. The ends of the axle and the nuts 10 70 are preferably inclosed by a dust-proof cap, as 11, which is screw-threaded upon a portion of the hub 6. The rim of each wheel 2 is preferably formed in two parts, one portion, 12, of which is formed integral with the 75 web portion extending to the hub 6, while the other portion, 13, engages ball-bearings which are interposed between it and a disk, as 14, formed upon the sleeve 5. The portion 13 of the rim is suitably joined and secured to the 80 portion 12, the two parts forming a peripheral groove to receive a tire, preferably of rubber, as 15, said tire being of any suitable or desired construction. Upon the inner periphery of the rim portion 12 is formed an internal gear, as 16, said gear being located approximately upon the central vertical plane 85 of the wheel. The gear 16 is adapted to be engaged and actuated by means of a pinion, as 17, which is secured upon the outer end of a shaft 18, mounted in the frame 1. This 90 shaft 18 finds bearing at its inner end at 19 in the frame of the running-gear and preferably has an end friction-bearing, as at 20, in the said bearing 19 to receive its end thrust. 95 The shaft 18 also extends through the disk 14 and is provided with a suitable bearing, as at 21, formed therein. The shaft 18 may be connected in any suitable manner with the motor for receiving power and thus communicating the same through the pinions 17 to the internal gearing 16 or rotating the drive 100 wheel or wheels and propelling the vehicle.

It will be noted by examining Fig. 1 of the



drawings that the rim 13 is comparatively small and extends only a short distance toward the axial point of the wheel. The disk 14, on the other hand, is of considerable size and reaches to within a short distance of the said rim portion 13, thus closing the internal gearing 16 entirely within the wheel and protecting it from dust or grit of any kind. Since the rim portion 13 moves with the wheel 2 and the disk 14 is stationary, I employ roller-bearings, as 22, which are interposed between the peripheral grooves formed in the said rim 13 and the disk 14. These grooves form seats or bearings in which the balls may run. In order to protect these bearings from dust or other foreign substances, I form an overhanging flange, as 23, upon the disk 14, as seen in Fig. 1.

Both of the rear wheels 2 may be constructed in the manner above described, in which case a second shaft, like the shaft 18, will be employed and connected with a source of power for communicating movement to the wheel upon the other side of the vehicle.

The steering mechanism also forms an important feature of my invention. The front wheels 3 are mounted upon short shafts, as 24, roller-bearings, as 25, being interposed between the said wheels and the said shaft to reduce the friction. To the inner ends of each of the short shafts 24 are secured vertical guide-spindles, as 26, which find suitable bearings in the guide-heads 27, formed upon each side of the vehicle. Each of the steering-heads 27 is formed so as to receive upper and lower ball-bearings, as at 28 and 29, which engage the said spindle 26 and support the same in its vertical position. The lower balls 29 rest against a peripheral shoulder 30, formed upon a spindle 26, and engage a raceway, as 31, formed in the lower end of the head 27. The upper balls 28 run in a suitable raceway, as 32, also formed in the head 27, and both of the ball-bearings thus formed are adjusted and held in place by means of a cone, as 33, secured in place upon the spindle 26. This cone 33 is held in place by means of a washer 34 and a cap or nut, as 35. A binding-nut, as 36, holds the cap-nut 35 against accidental displacement. It will thus be seen that each of the wheels 3 is mounted so as to turn freely and in such a manner that there is little chance for friction between the parts. To the lower ends of the spindle 26 and just inside of the inner ends of the short shafts 24 are mounted segmental gears, as 37 37, the said segmental gears 37 37 being semicircular in shape. Interposed between the segmental gears 37 37 and meshing with each of them is an actuating pinion or gear wheel, as 38, secured to the lower end of a vertical shaft 39. The shaft 39 engages bearings, as at 40, in the frame of the vehicle and extends upwardly to a suitable height, being provided at its upper end with a hand operating-wheel, as 41, by which it may be turned to actuate the guiding-wheels. If desired, the hand-wheel

41 may be replaced by means of a hand-lever without departing from the spirit of my invention. The steering-heads 27 27 are preferably braced with respect to each other by means of rods or tubing, as at 42 42. These steering-heads 27 are also braced with respect to the frame 1 by means of diagonal tubing 43 43. The said tubing is connected at the front of the vehicle to each of the heads 27 and at the rear to bearings 21 upon the disk 14. The central portion of this bracing structure is held in place by a coupling, as 44. By crossing the tubing thus in the center of the vehicle a larger space is allowed for the turning of the wheels 3 upon their spindles. I also mount upon the coupling 44 anti-friction-rollers, as 45, which limit the inner movement of the wheels 3 and prevent them from coming in contact with the braces.

In some forms of vehicles, where it is not necessary to use such heavy bracing, the tubing 43 may be replaced by means of diagonally-arranged cables, as 46 46, as illustrated in Fig. 4 of the drawings.

In making strong trucks for very heavy work it is sometimes necessary to further brace the framework of the vehicle to withstand the strain, and in this instance I employ brace-rods 47. (Shown in Fig. 5 of the drawings.) When the braces 47 are employed, the diagonal braces may be used or not, as may be desired. The bearing 19 is braced with respect to the bearing 40 by means of a longitudinal brace rod or tube, as 48, and the said bearing 19 may also be braced with respect to the sleeve 5 by means of a rod or bar, as 49.

It will be evident from the above description that I am enabled to produce a running-gear which is particularly well adapted for motor-vehicles and one in which the driving-gearing can be completely inclosed to protect it from dust or other foreign substances which are detrimental to the same. It will also be observed that the steering mechanism is of a simple and yet effective construction and that it can be readily controlled from the vehicle.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A running-gear for motor-vehicles comprising guide-wheels and drive-wheels mounted upon a suitable frame, the drive-wheels being formed with a main rim having internal gears, an auxiliary rim moving therewith, a stationary inclosing plate, a bearing interposed between the said plate and the auxiliary rim, pinions engaging the said internal gears being mounted upon suitable shafting which may be connected with any source of propulsion, the construction being such that the gearing may be completely inclosed and protected, substantially as described.

2. A vehicle running-gear comprising a suitable framework steering-wheels and driving-wheels for supporting the same, the said driv-



ing-wheels being provided with internal gears, mounted near the peripheries thereof, pinions for engaging the said gearing to rotate the wheels and connected with any suitable source of power, and disks secured to the said frame and inclosing the internal gears of the wheel, and ball-bearings interposed between the said disks and the peripheries of the wheels, substantially as described.

3. A running-gear for vehicles comprising a frame mounted upon suitable wheels, the driving-wheels being formed with internal gears and having rims formed of divided rim portions the inner rim portions having annular bearing-grooves inclosing disks secured to the said frame, and having peripheral bearing-grooves and intermediate balls interposed between the grooves upon the rim portion and the grooves upon the disk for forming an antifriction-joint between the two, a pinion for engaging the internal gearing, and means for driving the said pinion to rotate the driving-wheels, the construction being such that the driving-gearing may be entirely inclosed within the drive-wheels and protected thereby from dust and foreign substances, substantially as described.

4. A running-gear for motor-vehicles comprising a suitable frame mounted upon guiding and driving wheels, the driving-wheels being formed with hubs mounted upon the ends of a suitable axle, roller-bearings interposed between the said axle and the said hubs, antifriction-washers mounted between the roller-bearings, the said wheels being also formed with internal gears above their peripheries, a sleeve surrounding the said axle and provided at its ends with disks extending toward the peripheries of the wheels, ball-bearings interposed between the said disks and the peripheries of the wheels, and means for actuating the internal gears, the construction being such that the said internal gearing is entirely inclosed and protected, substantially as described.

5. A running-gear for motor-vehicles, comprising a frame having a sleeve, an axle mounted in the said sleeve and projecting beyond the ends thereof, driving-wheels mounted upon the ends of the said axle and having peripheral portions for holding a suitable tire, one of the said peripheral portions being provided with annular bearings, disks formed upon the ends of the said sleeve and extending toward the peripheral portions, antifriction-balls mounted between the said disk and the said peripheral portion, and an overhanging flange for excluding dirt and foreign sub-

stances from said bearings, internal gears formed upon the inner peripheries of the rims 60 of the wheels, a pinion for actuating the said gears secured upon the ends of the shafts, the said shaft passing through the disk and finding a suitable bearing in the frame of the vehicle, the construction being such that the 65 gearing is entirely inclosed and protected from dust and foreign substances, substantially as described.

6. In a running-gear for vehicles, the combination with a suitable frame, of vertical 70 journal-bearings or steering-heads formed therein comprising a hollow cylindrical body portion having upper and lower ball-runways, vertical spindles or bearings secured to the skeins of the guiding-wheels and extending 75 upwardly through the said hollow body portions, balls interposed between the said spindles and the said body portions, cones for holding the balls in place, cap-nuts for closing the tops of the hollow body portions and 80 holding the cones in position, binding-nuts for holding the spindles and the caps in place, and means for rotating the spindles so as to guide the steering-wheels, substantially as described. 85

7. In a running-gear for motor-vehicles, comprising in its construction driving-wheels and guiding-wheels, a frame connecting the said wheels comprising a rear-axle sleeve, disks secured thereto and forming the inner face 90 of the driving-wheels, vertical steering-heads mounted near the guiding-wheels, diagonally-arranged braces connecting the said steering-heads with the said disks for thoroughly bracing the parts with respect to each other, and 95 means for operating the guiding-wheels, substantially as described.

8. A running-gear for vehicles, comprising a frame having suitable guide-wheels, each of said wheels having independent shafts pro- 100 vided with vertical spindles engaging suitable steering-heads, means for bracing said steering-heads with relation to the frame of the vehicle, comprising diagonally-arranged rods, a central coupling holding said rods in place 105 and antifriction-rollers mounted upon each side of the coupling to prevent the said wheels from engaging the said bracing structure, substantially as described.

In testimony whereof I hereunto affix my 110 signature in presence of two witnesses.

JOHN WASHINGTON EISENHUTH.

Witnesses:

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