No. 677,968. Patented July 9, 1901.

C. T. FLETCHER.

COMPENSATING GEAR FOR VEHICLES.

(No Model.) (Application filed June 14, 1900.) 3 Sheets—Sheet 1.

FIG. 1.

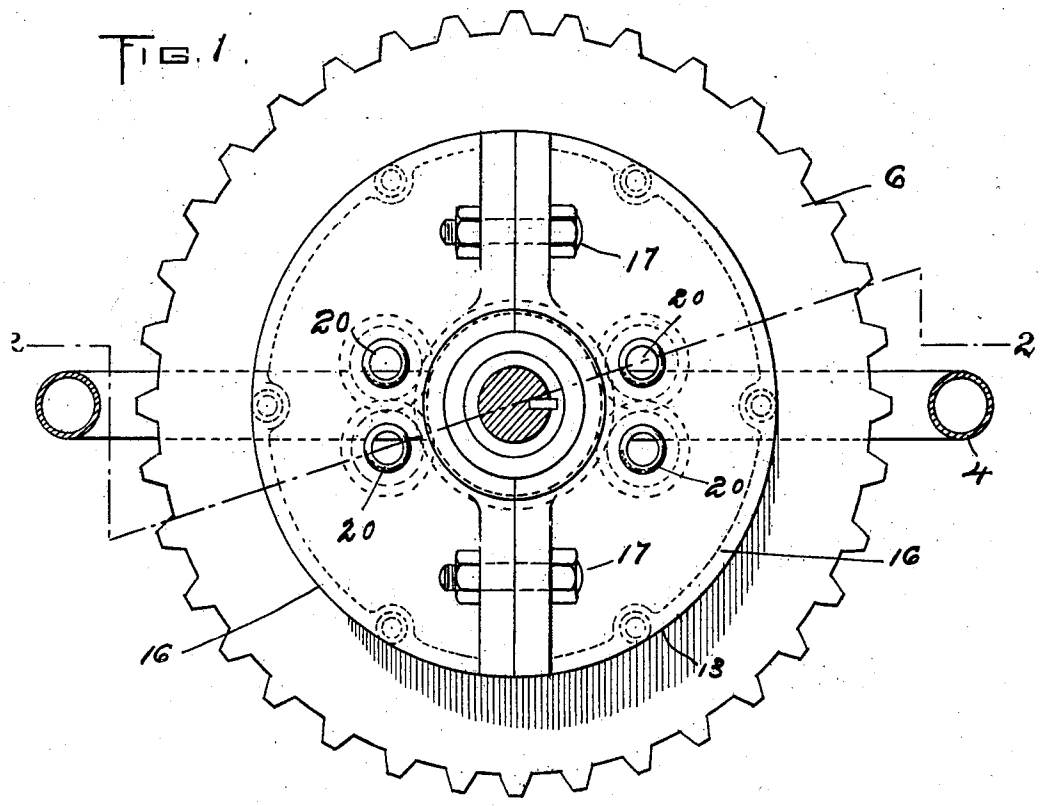
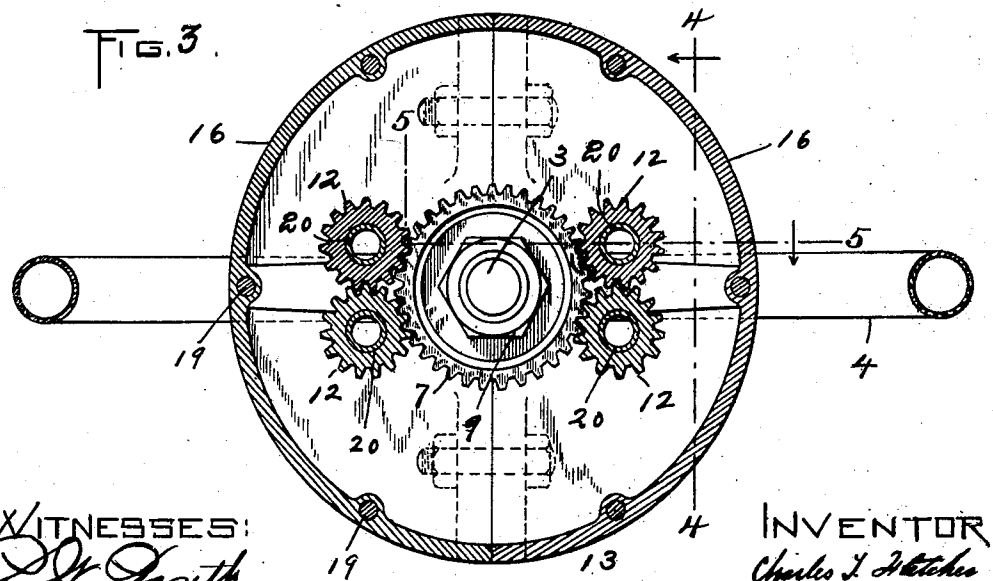


FIG. 3.



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(No Model.) 3 Sheets—Sheet 2.

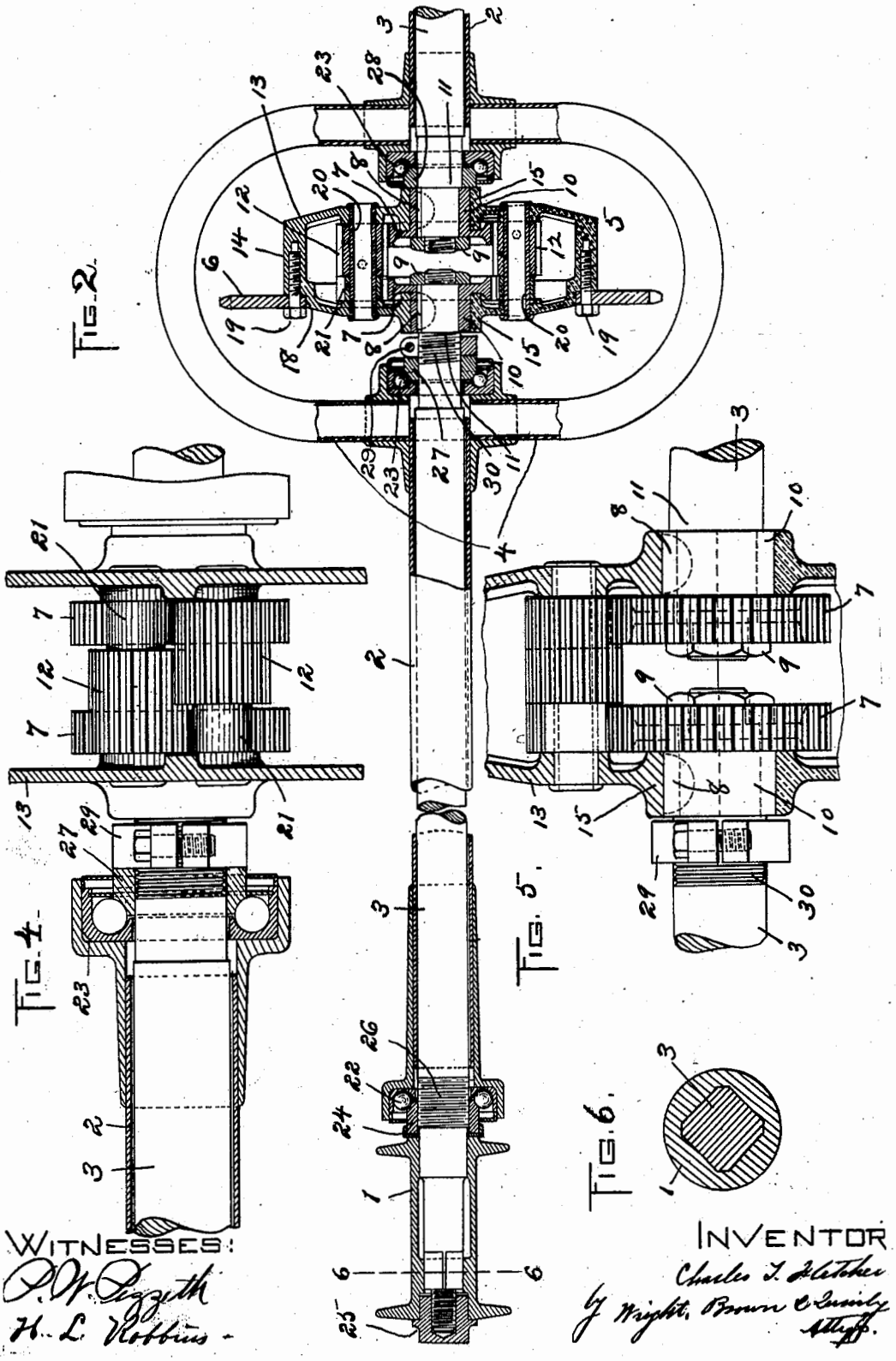

FIG. 2.

FIG. 4.

FIG. 5.

FIG. 6.

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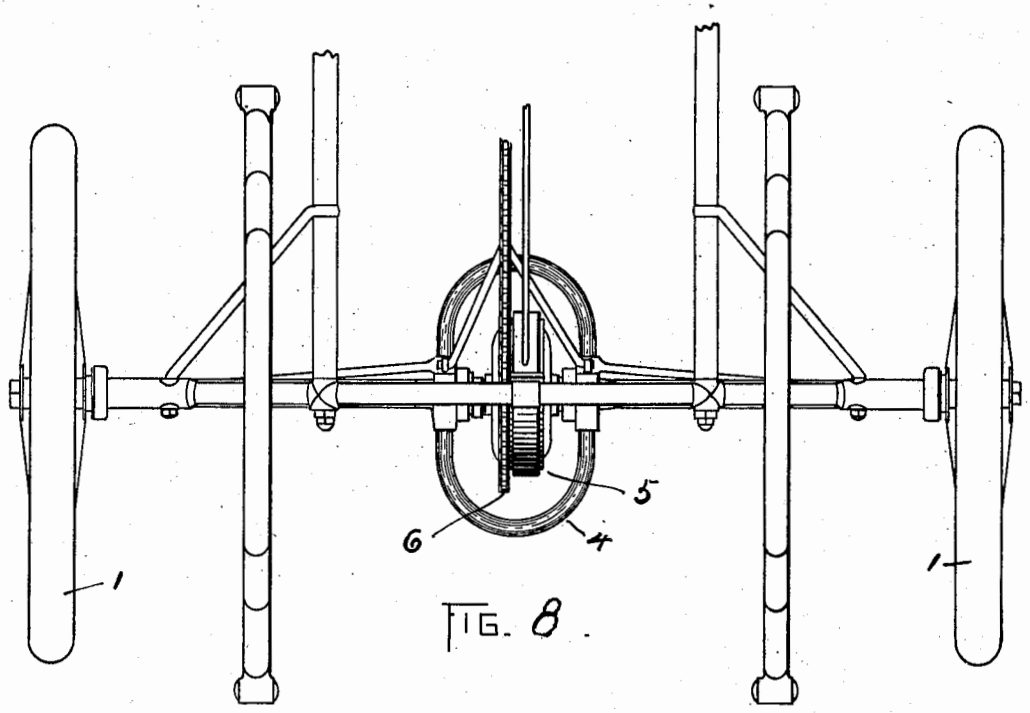

FIG. 8.

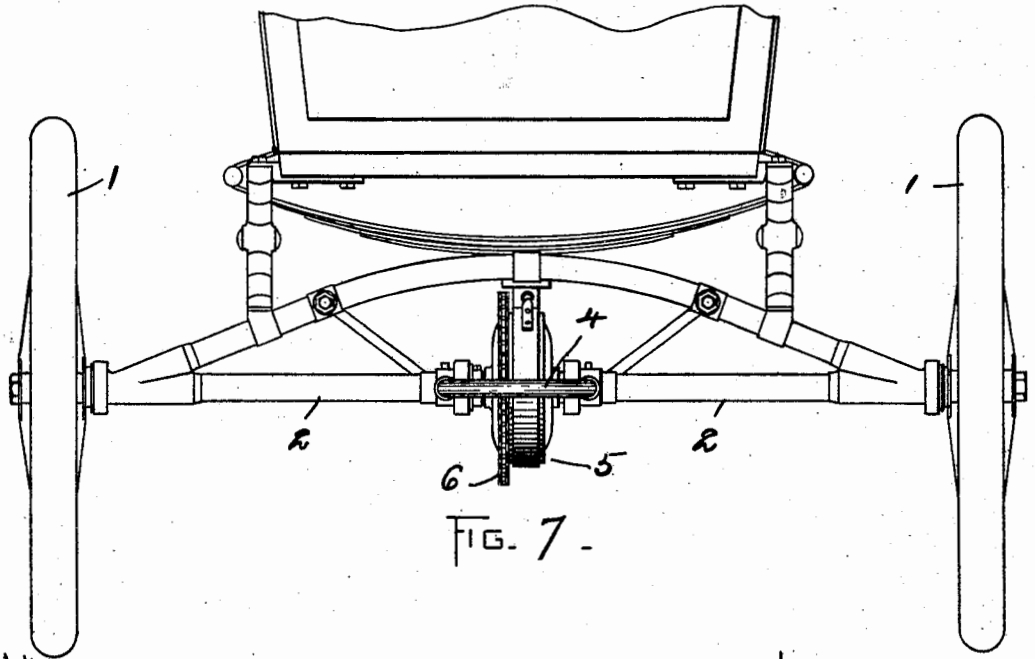

FIG. 7.

WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES T. FLETCHER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE LOCOMOBILE COMPANY OF AMERICA, OF NEW YORK, N. Y.

COMPENSATING GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 677,968, dated July 9, 1901.

Application filed June 14, 1900. Serial No. 20,324. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. FLETCHER, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Compensating Gears for Vehicles, of which the following is a specification.

This invention relates to the compensating gear employed to connect the driving-axles of road-vehicles and designed to permit unequal rotary movements of the driving-wheels in making turns.

The invention has for its object to improve the general structure of compensating gears, the improvements looking particularly toward the protection of the gearing, easy-running qualities, simplicity of construction, ease of assembling, and the adjustment of the wheel-axles with respect to the gear.

Of the accompanying drawings, Figure 1 represents a side elevation of a compensating gear constructed in accordance with my invention. Fig. 2 represents a horizontal sectional view of the gear and the outer end of one of the axles. Fig. 3 represents an intermediate section through the gear in a plane at right angles to the axles. Figs. 4 and 5 represent sections on the lines 4 4 and 5 5 of Fig. 3. Fig. 6 represents a section on line 6 6 of Fig. 2. Fig. 7 represents a rear elevation of the running-gear of a road-vehicle, showing the location of the compensating gear. Fig. 8 represents a plan view thereof.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 1 represent the driving-wheels of the vehicle, and 2 2 represent the tubular axle-housings inclosing the driving-axles 3 3 and connected at their inner ends by a yoke 4. Between the inner ends of the two housings 2 2 is located the compensating gear, which is denoted generically by the numeral 5 and is provided externally with a suitable power-transmitting wheel or member, such as the sprocket-wheel 6, whereby the gear is connected with the driving agent.

As constructed in accordance with my invention the compensating gear includes the following features or substantial equivalents thereof: 7 7 are two spur-gears of equal size fixed to the inner or adjacent ends of the axles 3 3 by means of keys 8 8 and held thereon by means of nuts 9 9. Elongated seats are obtained for the gears 7 by forming them with sleeve-hubs 10, the outer ends of which abut against shoulders 11, formed on the axles 3, the nuts 9 serving to hold the gears against said shoulders.

The compensating movement is obtained by means of two pairs of spur-gears 12 12, journaled on a frame 13, to which the sprocket-wheel 6 is affixed, and the periphery of which is also preferably formed as a brake-drum 14. The two gears 12 of each pair of the idlers or intermediate gears are elongated sufficiently to mesh with the respective axle-gears 7 7 and with each other, as clearly represented in Figs. 4 and 5. I do not limit myself in respect to the number of pairs of these idle or intermediate gears which may be employed.

The frame 13, which journals the intermediate gears 12 12, is made in the form of a hollow closed box or casing having two bearings 15 15 on the respective axles 3 3 outside of the axle-gears 7 7, the actual bearing of the casing being on the hubs of the gears 7. To permit the parts to be readily assembled or taken apart, I make the casing 13 in a plurality of separable segments, the construction being best shown in Figs. 1 and 3, which represent the casing as composed of two sections 16 16, secured together by bolts 17 17. The sprocket-wheel 6 is made in the form of a continuous ring fitted on an annular shouldered seat 18 on the casing 13 and secured to both segments of the casing by means of screws 19 19. A simple and light bearing is provided for the intermediate gears 12 12 by mounting each gear on a separate cylindrical tube 20, the ends of which are passed through apertures in the side walls of the casing 13 and expanded on the outside of said walls. The gears 12 are held in their proper positions on the tubes 20 by means of spacing-sleeves 21. When power is applied to the sprocket-wheel 6, the frame or casing 13, carrying with it the intermediate gears 12, will be rotated as a whole, and if the resistance to the rotation of the axles 3 3 is equal, as when the vehicle is traveling

straight ahead, there will be no relative movement of the gears. If, however, the resistance of one of the driving-wheels is greater than of the other, as in making a turn, that wheel will be allowed to travel relatively slower and the other wheel relatively faster through a compensating movement of the gears.

Bearings 22 23 are provided for the axles 3 at both the outer and inner ends of the tubular housings 2, said bearings being here shown as of the antifriction-ball type, acting both as supporting journals or bearings and as longitudinal end-thrust bearings. The preferred manner of affixing the wheels 1 to the axles 3 is shown at the left hand of Fig. 2. The wheel-hub is held to a shoulder 24 on the axle 3 by means of an end nut 25, and relative rotary movement is prevented by squaring the axle and hub, as represented in Figs. 2 and 7. The shoulder 24, as here shown, is formed by the outer end of an adjusting-cone which forms a part of the bearing 22 and screws on a threaded part 26 of the axle 3, so as to adjust the bearings 22 and 23. A complemental bearing-cone 27, forming a part of the bearing 23, is located on the inner end of the axle 3. 28 is a bearing-cone similar to cone 27 and forming a part of the bearing 23 at the inner end of the right-hand axle. Cone 28 has a fixed seat against the end of the gear-hub 10. Adjustment for the bearings of the right-hand axle is effected at the outer end of said axle. It will be noted that the right-hand one of the bearings 15 of casing 13 is held between the adjusting-cone 28 and the inner face of the axle-gear 7 and is thus maintained in a fixed relation with the right-hand axle 3, the cone 28 being fixed when the bearings of said axle are properly adjusted. The two axle-housings 2 2 are held in a fixed or rigid relation through the yoke 4. When wear occurs in the bearings of the axles, it is taken up by adjusting the cone (not shown) at the outer end of the right-hand axle and both of the cones of the left-hand axle-bearings, for if the wear is in the latter bearings both cones 24 27 must be adjusted toward each other, so as to leave the left axle in its former relation to the compensating gear and to the right axle, and if the right-hand axle-bearings wear the adjustment at the outer end of said axle will move the axle to the right slightly, carrying also the gear-case 13, and will hence necessitate moving the left axle to the right in its bearings.

To take apart the compensating gear, the axles 3 3 are moved toward each other to clear the outer rim-flanges of the axle-gears 7 7 and the inner hub-flanges of the casing 13, which, as shown in Fig. 3, are normally overlapped, and the halves of the casing, together with the intermediate gears carried thereby, may then, after removing their bolts and the sprocket 6, be removed by a lateral movement with respect to the axles. As respects the radially-divided frame for the intermediate gearing my invention is not limited to spur compensating gears.

I claim—

1. In a compensating gear for vehicles, the combination of the two driving-wheel axles, gears on the adjacent ends of said axles, intermediate gearing connecting the axle-gears, a frame journaling said intermediate gearing and having a power-transmitting periphery, said frame being divided radially into a plurality of separable segments separable by a movement transverse with respect to the axles, and means for securing said segments together.

2. In a compensating gear for vehicles, the combination of the two driving-wheel axles, gears on the adjacent ends of said axles, intermediate gearing connecting the axle-gears, a frame journaling said intermediate gearing and made in the form of a casing having two bearings on the respective axles, outside of the said axle-gears, and having a power-transmitting periphery, said frame being made up of a plurality of separable segments, each having a portion of each of said bearings, and means for separably securing said segments together.

3. In a compensating gear for vehicles, the combination of the two driving-wheel axles, gears on the adjacent ends of said axles, intermediate gearing connecting the axle-gears, a frame journaling said intermediate gearing and divided radially into a plurality of segments separable by a movement transverse with respect to the axles, a toothed power-transmitting wheel made in the form of a continuous ring embracing said frame and means for separably securing said ring to the frame.

4. In a compensating gear for vehicles, the combination of the two driving-wheel axles, spur-gears on the adjacent ends of said axles, a frame having a power-transmitting periphery and made in the form of a casing inclosing the axle-gears, and a train of intermediate spur-gears connecting said axle-gears and journaled on said casing, the bearings for said intermediate gears being cylindrical tubes expanded at both ends into the sides of the casing.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES T. FLETCHER.

Witnesses:

A. D. HARRISON,

P. W. PEZZETTI.