

1,348,568.

D. KEMBLE.
ELECTRICALLY PROPELLED VEHICLE.
APPLICATION FILED MAR. 10, 1919.

Patented Aug. 3, 1920.

2 SHEETS—SHEET 1.

FIG. 2

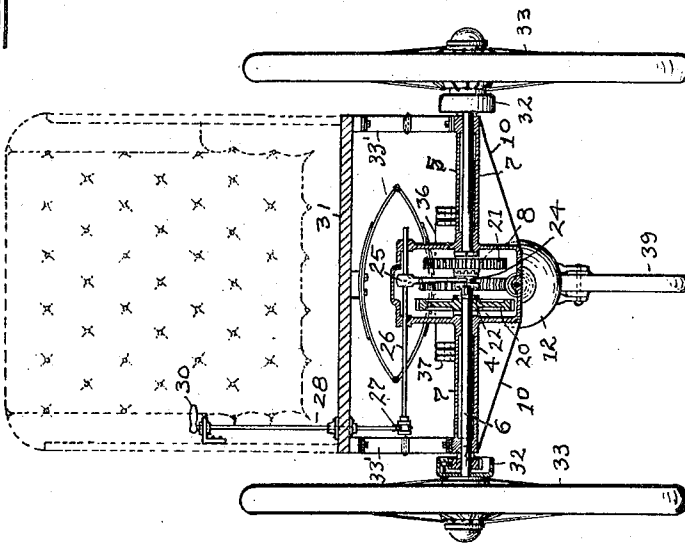


FIG. 3

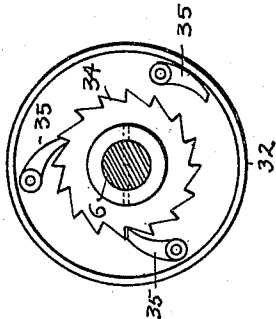
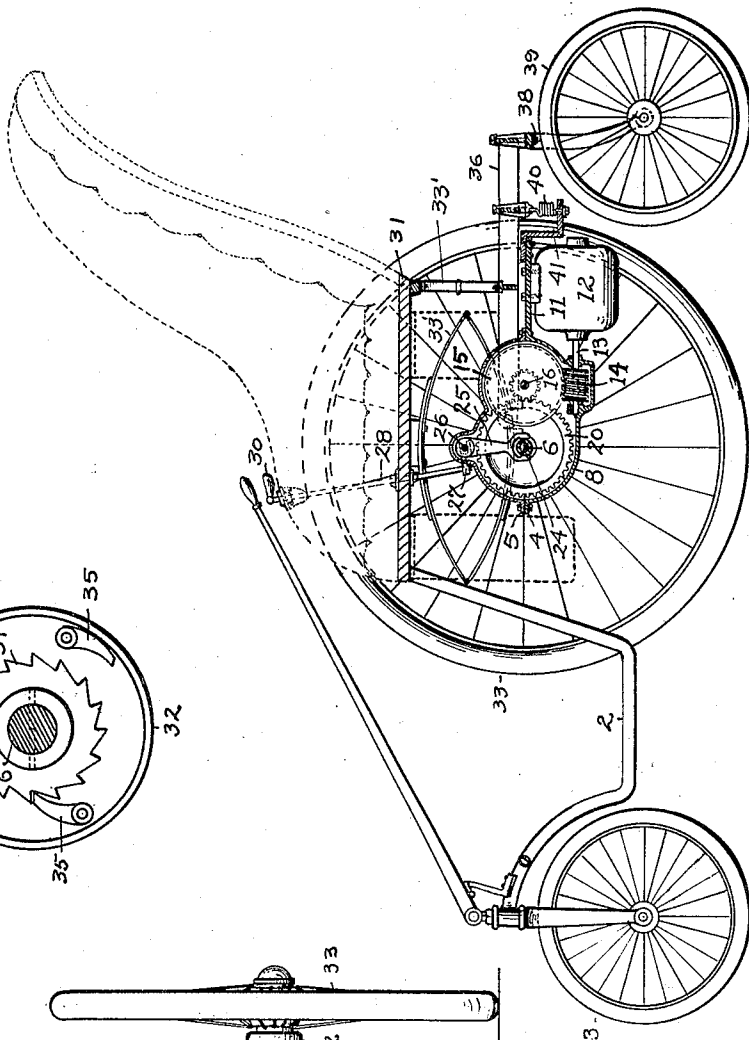


FIG. 1



INVENTOR
DUSTON KEMBLE

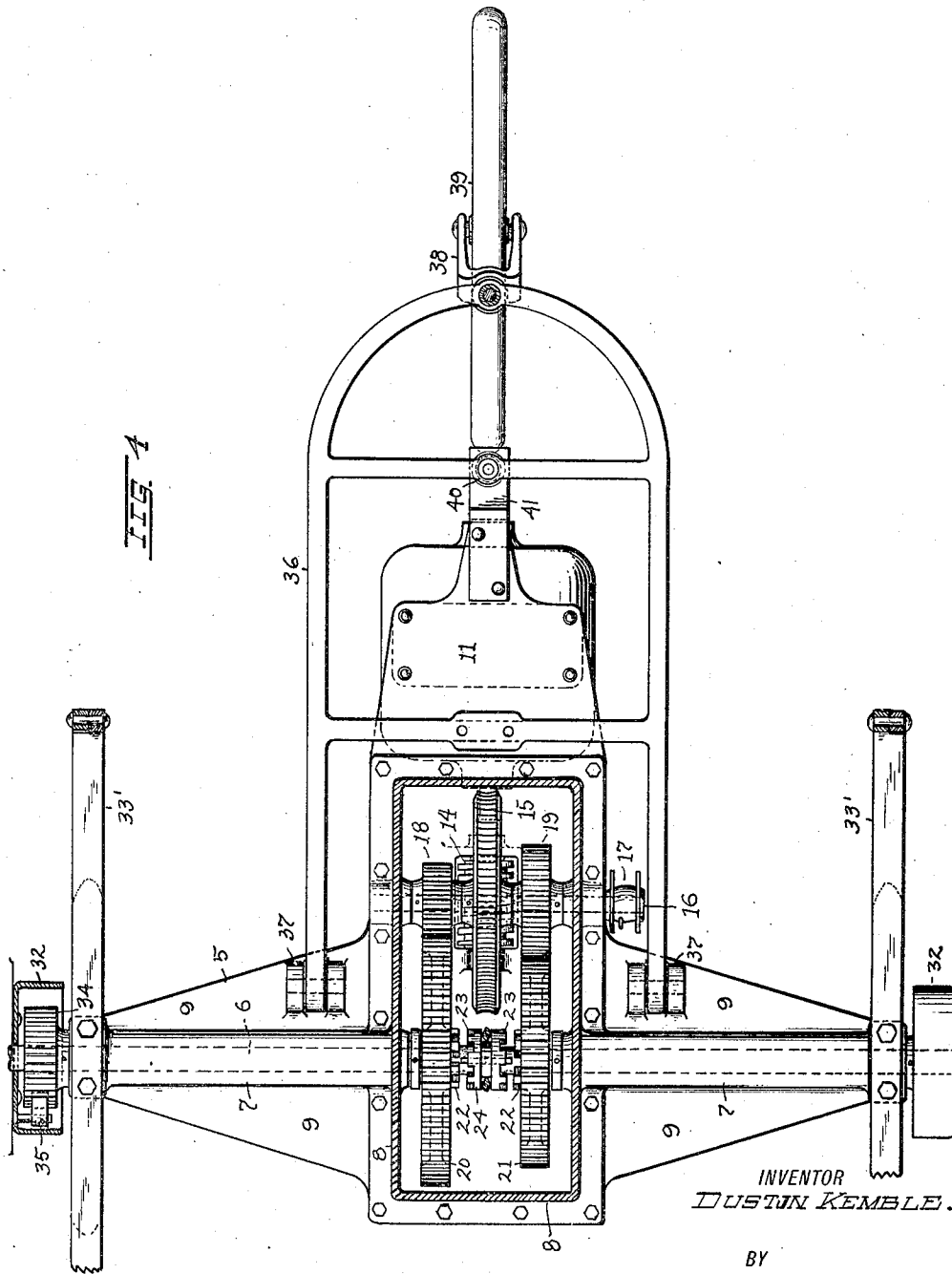
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

DUSTON KEMBLE, OF CORTLAND, OHIO.

ELECTRICALLY-PROPELLED VEHICLE.

1,348,568.

Specification of Letters Patent.

Patented Aug. 3, 1920.

Application filed March 10, 1919. Serial No. 281,327.

To all whom it may concern:

Be it known that I, DUSTON KEMBLE, citizen of the United States, residing at Cortland, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Electrically-Propelled Vehicles, of which the following is a specification.

This invention relates to electrically propelled vehicles, and is an improvement in and over the electrically-propelled rolling chair disclosed in my Letters Patent No. 1,262,806, of April 16, 1918. The improvements consist in the omission of some parts formerly used in the patented structure, the modification of other parts, and the introduction of new elements, all with the view of simplifying the construction, reducing the cost, and making the vehicle economical and efficient in operation. The present vehicle has also been especially designed to ascend grades and surmount low street curbs without a weight of storage battery or motor beyond what is required to propel the vehicle at its normal rate of travel along an ordinary level road, and the present organization of parts also gives more strength and operates more effectively in overcoming jars and vibrations in the movement of the vehicle than in a chair constructed according to my former plans. A further improvement is embodied in the present arrangement of parts for drawing the chair up an inclined track by means of a cable and a winding drum, all as will hereinafter more fully appear.

In the drawings forming part of this application, Figure 1 is a vertical section centrally through my improved vehicle, and Fig. 2 is a vertical section also, but transversely of the vehicle on the line of the axle and looking toward the rear end thereof. The upper portion or body of the vehicle on both of said figures is shown in dotted lines, inasmuch as the body may be greatly varied and forms no part of the present invention. Fig. 3 is a detail view on an enlarged scale of the ratchet mechanism for the drive wheels of the vehicle. Fig. 4 is a top plan and part sectional view of the axle and gear housing and the other parts which are directly connected therewith, except the drive wheels which have been omitted.

The essentials of this invention are to be found more particularly in the drive and supporting parts which are associated with

the main drive wheels of the chair or vehicle. Therefore, the electrical system of control is not shown nor described herein, and the seat and foot frame 2 and steering wheel 3, as shown, is merely illustrative of one form of vehicle frame and steering gear which may be adopted. Thus, the invention resides in providing a main frame or running gear constructed of two cast metal or pressed members or sections 4 and 5, respectively which are bolted together in superposed relation, with an axle 6 extending transversely therebetween. Thus, the members 4 and 5 have counterpart shaft-confining and supporting extensions 7 at each side of a central enlargement or housing 8 within which a set of speed changing and reducing gears are confined. The line of union of the superposed members 4 and 5 is in the same horizontal plane as the axis of the axle or drive shaft 6, and the tubular extensions are thus divided into upper and lower halves or sections their full length and have flat horizontal flanges 9 at each side, which together with the bottom ribs 10 on the lower section 4, greatly strengthen the frame on the line of the axle. The central enlargement or housing 8 extends rearwardly a greater distance than forwardly, and a shelf or extension 11 is cast integral with the lower section 4 so that an electric motor 12 may be suspended therefrom by bolts with the motor shaft 13 extending forwardly on the longitudinal median line of the vehicle into the rear and bottom of the housing 8. A worm pinion 14 occupies a depression in housing 8 and meshes with a worm gear 15 on a short countershaft 16 extending transversely at the rear end of the housing, and one end of this shaft is projected outside of the housing where a drum or sheave 17 is provided to wind or unwind a cable and draw or lower the chair on an inclined track laid upon the steps leading to the entrance of a house or other building. No power is being applied to the axle when the drum or sheave is so used, and this is made possible by employing a simple arrangement of transmission gears together with a single clutch for controlling the travel of the vehicle at two different reducing speeds. Thus, I mount a pair of spur gears 18 and 19 of different sizes on countershaft 16 on opposite sides of worm gear 15, and provide two larger spur gears 20 and 21 of different diameters on the axle 6 to mesh

with the smaller gears and to reduce the speed of rotation of the axle. Gears 20 and 21 run loose or idle on the axle with a bushing between them and have clutch teeth 22 on their opposed faces adapted to be engaged alternatively by the teeth 23 on a collar 24 which is splined to slide on the axle, and when this collar is centrally related or in a neutral position neither one of the two gears 20 or 21 is engaged, which permits the cable winding drum or sheave 17 to be used during that interval if desired.

The means for controlling the position of clutch collar 24 comprises a forked arm 25 depending from a reciprocal rod 26 which extends transversely through the upper end of the housing where a finger 27 on the lower end of a vertical rock shaft 28 is adapted to engage or connect with the rod to move it in either direction whenever the rock-shaft 28 is turned by its handle 30. Any suitable lever or link connection may be made with rod 26, but the connection should either be of a flexible character or kind or the rock-shaft made to slide in its bearings, having in mind that the seat or body 31 of the chair or vehicle is mounted on springs and adapted to play up and down relatively to the running gear frame and the axle. As shown, three elliptical springs 33' are used, one extending transversely at the rear of the seat board 31, and the other two extending longitudinally of the chair and seated and bolted at the extremities of the tubular extensions 7 adjacent the brake drums 32 on the main drive wheels 33. These wheels are free to rotate in one direction on the shaft or axle 6 to permit differential movements in turning the chair, and the power is transmitted from the axle to each wheel by a ratchet wheel 34 pinned on the axle and by a set of pawls 35 pivoted within and upon the side wall of the brake drum 32 affixed to the hub of the wheel.

To stabilize the vehicle, absorb shocks, and make riding easier, I also hinge a yoke or open frame 36 upon upright lugs 37 cast integral with the flanges 9 of the upper section 5 of the main frame, and extend this yoke far enough to the rear of the main frame to permit the forked member 38 of a small follower wheel 39 to be swiveled therein. The rear transverse spring 33' of the chair is interposed between the seat board 31 and this swinging frame 36, and the rear or end of the main frame carrying the motor and power transmission is held suspended from the rear end of the swinging frame by a heavy coiled spring 40 connected to a drop bracket 41 affixed to or forming an integral part of the shelf or extension 11. The motor is thereby relieved of jars and at the same time partly carried by the swinging frame, and the spring between the seat board and the swinging frame helps still

further to absorb the rebounds and shocks on the main frame and to make riding easier. To balance the chair, the motor and worm gears and clutch are arranged on the middle longitudinal line of the chair and the pairs of speed-changing gears are placed at equal distances from this middle line at opposite sides of the worm gears, and a further balance is promoted by suspending the units of the storage batteries from the chair seat at the front and rear of the axle substantially as indicated in dotted lines Fig. 1.

What I claim is:

1. In an electrically propelled vehicle, an axle, a pair of speed-changing gears loosely mounted upon said axle, a clutch member splined to slide upon said axle to engage either gear, a motor and speed-reducing gears adapted to operate said speed-changing gears, a frame journaled on said axle supporting said motor and housing said gears, and means internally of said housing having a controlling device externally of said housing adapted to shift said clutch member, said motor and clutch member being arranged on a central line of said frame and vehicle and said gears being arranged in balanced relation on opposite sides of said central line.

2. In an electrically propelled vehicle, a pair of drive wheels, an axle in ratchet drive connection with each wheel, a pair of speed-changing gears sleeved to rotate freely upon said axle, a clutch collar on said axle between said gears, a movable member adapted to slide said collar in opposite directions, a housing for said parts having lateral extensions within which said axle is journaled and a rear extension adapted to support a motor, a motor suspended from said rear extension having power-transmitting connection with said gears within said housing, a horizontal frame hinged to said lateral extensions, a wheel swiveled to said frame, and a spring suspending said rear extension from said hinged frame.

3. In an electrically propelled vehicle, a main shaft and wheels in ratchet connection, a pair of spur gears of different sizes mounted to rotate freely upon said shaft at substantially equal distances from the longitudinal median line of said vehicle, a clutch splined to slide on said shaft between said gears and adapted to be rotated by either of said gears, a motor arranged on the longitudinal median line of said vehicle and speed-reducing gears adapted to operate said spur gears, a two-part housing frame journaled on said shaft and inclosing said gears, a shifting device for said clutch, springs mounted upon said housing-frame, and a vehicle body supported upon said springs.

4. In an electrically propelled vehicle, a drive axle, a main frame journaled on said

axle, a motor and power transmission mechanism mounted upon said frame, a swinging frame hinged upon said main frame having a supporting wheel, a suspension spring supporting said main frame and the parts thereon from said swinging frame, a body, and a spring seated upon said swinging frame adapted to support the body.

5. In an electrically propelled vehicle, an axle and drive wheels, a main frame having journals for said axle, a motor and power-transmitting means mounted upon said frame in driving connection with said axle, a swinging frame hinged upon said main frame having a swiveled supporting wheel, a suspension spring connecting said frames, a vehicle body, a pair of springs supporting said body upon said main frame, and a spring interposed between said body and swinging frame.

6. In an electrically propelled vehicle, a balanced running gear comprising an axle and wheels therefor, an axle housing, a countershaft journaled in said housing parallel with said axle, a motor centrally supported upon said housing having a shaft longitudinally of said housing on the longitudinal median line of the vehicle and provided with a worm pinion, a worm gear on said countershaft in mesh with said pinion and spur gears of different diameters at opposite sides of said worm gear, spur gears independently rotatable upon said axle in mesh with the first-named spur gears, a sliding clutch on said axle adapted to engage the spur gears thereon alternatively, and means within said housing adapted to shift said clutch having controlling connections externally of said housing.

7. In an electrically propelled vehicle, an axle having wheels and power transmitting mechanism, a housing for said axle and mechanism, said mechanism comprising a motor driven worm, a countershaft having a worm gear and a pair of spur gears thereon and provided with a cable-winding drum, a pair of spur gears mounted to rotate freely upon said axle, a clutch on said axle adapted to engage either spur gear thereon or to be placed in a neutral position in respect to both gears, said housing and power transmitting mechanism being arranged in balancing position on the longitudinal center line of the chair, and means adapted to control the working position of said clutch.

8. In a motor-driven rolling chair, an operating motor and a main axle for the chair

and a power-transmission system consisting of a worm pinion and a worm gear and a set of high and low reducing gears on opposite sides of said worm gear and having a pair of reducing gears mounted loosely on the said main shaft, said motor and pinion and worm gear being arranged on the longitudinal center line of said chair and said gears being arranged in balancing relation on opposite sides of said center line.

9. In a motor-driven rolling chair, a power-transmission system between the operating motor and the main axle of the chair comprising separate pairs of high and low speed reducing gears arranged in balancing relation on opposite sides of the center line of said chair and a sliding clutch between them on the main axle shaft, and slidable connections and a lever whereby the said clutch may be engaged with either one or the other pair of reducing gears to rotate the main axle at the speed desired.

10. In an electrically propelled vehicle, a power transmission system comprising separate pairs of high and low speed reducing gears arranged in balancing relation on opposite sides of the longitudinal center line of the chair and a counter shaft and a main shaft, and a shifting clutch on the main shaft adapted to throw either pair of reducing gears into action or to throw out both pairs of gears, and a cable winding drum on the counter-shaft adapted to be used in moving the chair.

11. In an electrically propelled rolling chair, a chair seat and swinging yoke attached under the chair seat at one end and having a rear wheel mounted in a swivel joint at the other end and a direct spring connection between said yoke and the chair seat at a point between the swinging attachment and the swivel joint for the rear wheel.

12. In an electrically propelled rolling chair, a chair seat and a main supporting frame and a swinging yoke attached at its divided end to the main supporting frame of the mechanism, said frame having hinged lugs projecting from said main frame under the chair seat and having a rear wheel mounted in a swivel joint at the opposite end of said yoke to carry part of the weight of the said main supporting frame.

Signed at Cortland, in the county of Trumbull, and State of Ohio, this 5th day of March, 1919.

DUSTON KEMBLE.