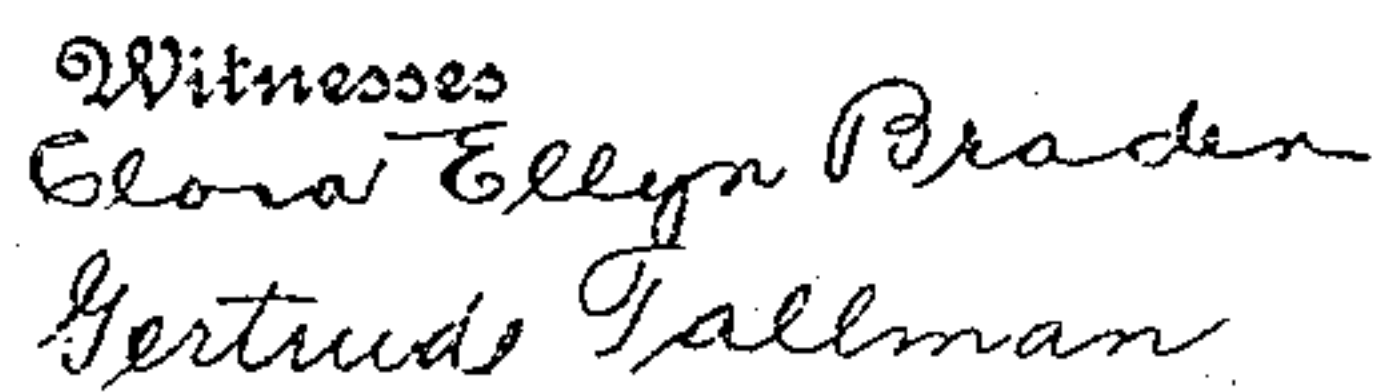


RAILWAY MOTOR CAR.

938,582.

Patented Nov. 2, 1909.

3 SHEETS—SHEET 1.



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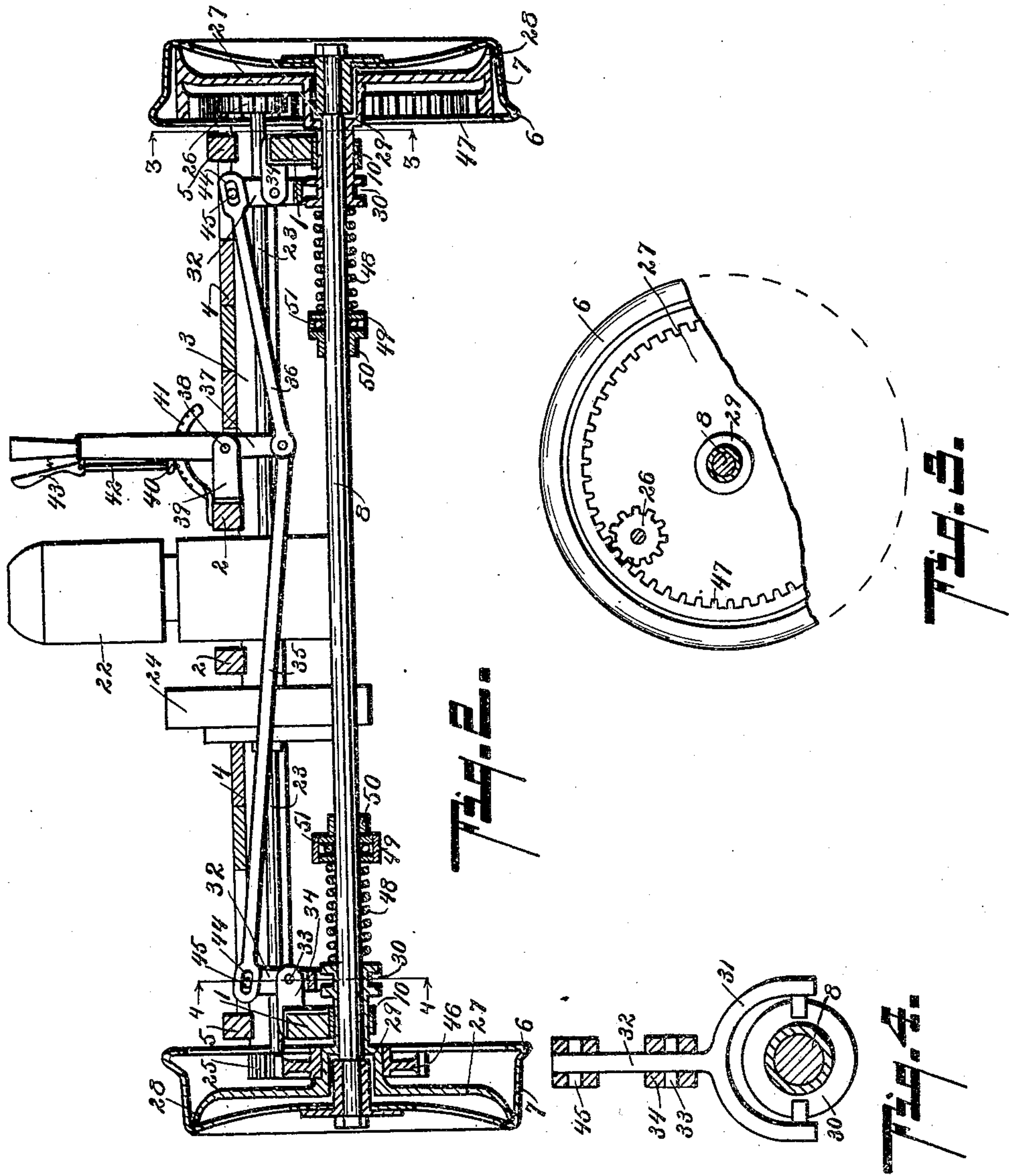
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RAILWAY MOTOR CAR.  
APPLICATION FILED MAR. 11, 1909.

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3 SHEETS—SHEET 2.



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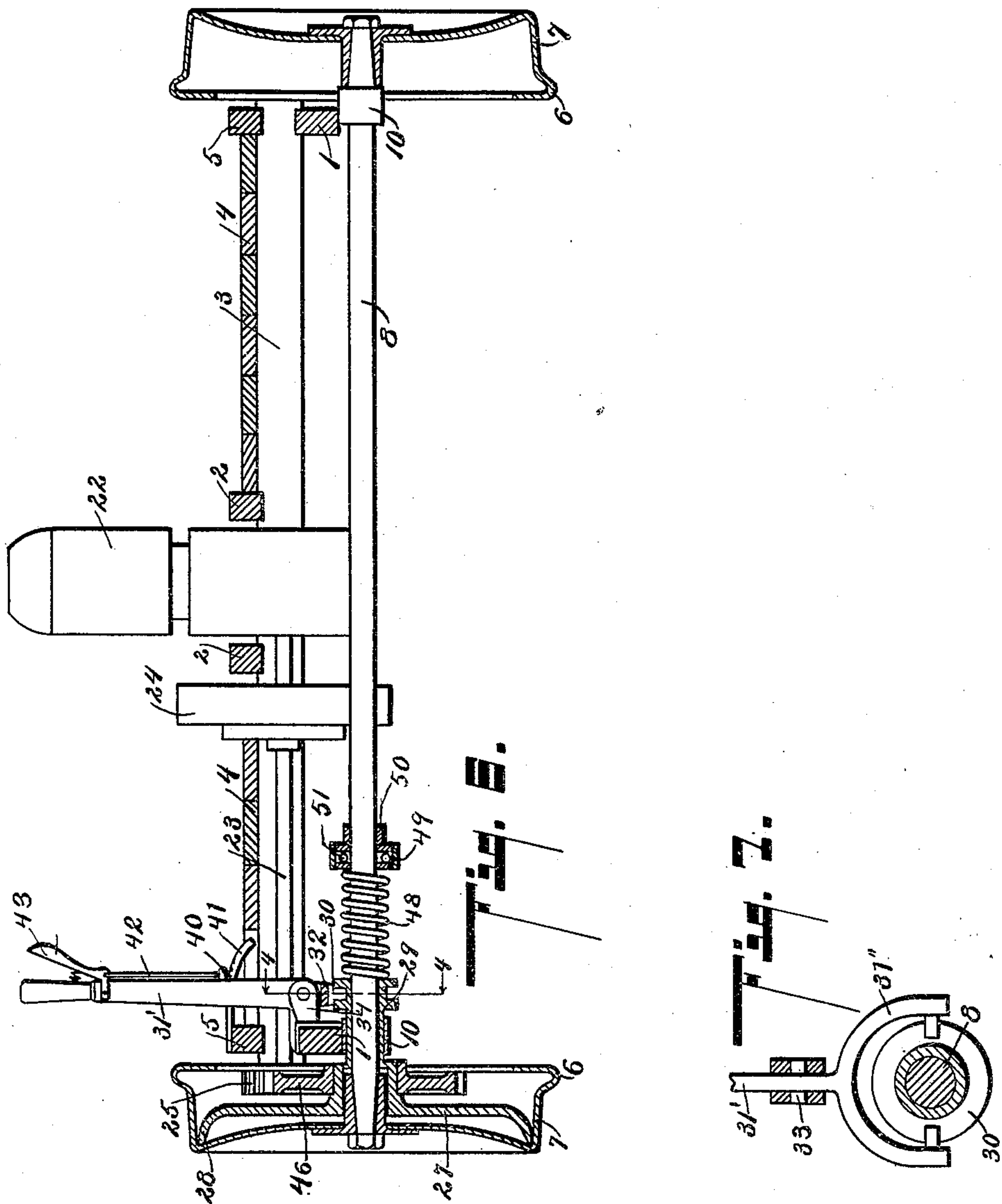
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# UNITED STATES PATENT OFFICE.

WILLIAM S. HOVEY AND MILTON H. RIX, OF THREE RIVERS, MICHIGAN, ASSIGNORS TO  
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## RAILWAY MOTOR-CAR.

938,582.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed March 11, 1909. Serial No. 482,787.

*To all whom it may concern:*

Be it known that we, WILLIAM S. HOVEY and MILTON H. RIX, citizens of the United States, residing at Three Rivers, Michigan, have invented certain new and useful Improvements in Railway Motor-Cars, of which the following is a specification.

This invention relates to improvements in railway motor cars, although it is applicable for use in other forms of motor cars.

The objects of this invention are: First, to provide an improved drive connection for the engine to the traction wheels. Second, to provide in a driving connection for motor cars a clutch means in which one of the traction wheels forms one of the clutch members. Third, to provide an improved motor hand car in which the parts are very simple in structure and arrangement, so that an engine can be applied to a car of common or standard construction.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of our invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail side elevation of a structure embodying the features of our invention. Fig. 2 is a detail vertical sectional view taken on a line corresponding to line 2—2 of Fig. 1. Fig. 3 is a detail vertical section taken on a line corresponding to line 3—3 of Fig. 2, a portion of the wheel being broken away. Fig. 4 is an enlarged detail vertical section taken on a line corresponding to line 4—4 of Fig. 2, showing details of the shifting mechanism. Fig. 5 is a detail plan of the driving connection for the walking beam to one of the axles. Fig. 6 is a detail sectional view similar to that appearing in Fig. 2, showing a modification in which but a single clutch is used. Fig. 7 is an enlarged detail sectional view on line 4—4 of Fig. 6.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are

taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the body of our improved car preferably consists of the longitudinal side sills 1, 1, and the central longitudinal sills 2, 2, with cross sills 3. The platform 4 is laid upon the cross sills and is provided with side bars or side rails 5 at the edges, the said bars being arranged to rest upon the cross sills, as clearly appears from Fig. 2.

The traction wheels are secured to the axles 8 and 9, the axles being supported in suitable bearings 10 secured to the under side of the longitudinal sills 1. The gallow's frame 11 is arranged centrally of the platform or deck. The walking beam 12 is provided with handles 13 at each end, and is centrally mounted on the gallow's frame. The walking beam is connected to one of the axles through the connecting rod 14, which is connected at one end to the walking beam and at the other end to the crank shaft 15 on which is a gear 16.

A pinion 17 is splined to the axle 9 so that it may be shifted into and out of engagement with the gear 16', thereby throwing the hand propelling means into or out of gear as desired, the same being shown in its disconnected position in Fig. 5. A lever 18 is provided, with a fork 19 at its lower end to engage the groove 20 in the hub of the pinion 17.

We preferably secure the walking beam 12 in a horizontal position when the driving connection therefor to the axle is disconnected, so that the walking beam serves as a support for persons riding, as the car is without seats. This we accomplish in a simple manner by providing a hook 21 which is pivoted on the gallow's frame.

The engine 22 is arranged in front of the gallow's frame, preferably centrally of the car, as is illustrated in Fig. 2. The engine shaft 23 is provided with a fly wheel 24. The engine shaft extends each side of the engine and is provided with a driving gear 25 at one end and with a driving gear 26 at the other. Each of the traction wheels is secured to the axle 8 and is adapted to form one member of a clutch. Each clutch 27 is preferably provided with a flange-like periphery 28 arranged on the inside of the traction wheel and adapted to engage the in-



side thereof, the edge of the flange being preferably arranged to engage both the web and the tread, as clearly appears from the drawing. These clutch members are provided with hubs 29 which project through the bearings 10 for the axles. At their inner ends they are provided with annular grooves 30, with which the forks or arms 31 of the lever 32 engage. These levers are pivoted at 33 on the bracket-like arms 34. The upper ends of the levers are connected by the links 35 and 36 to the lower end of the actuating lever 37, which is pivoted at 38 on the arm 39. This lever is provided with a latch 40 adapted to engage the segment 41, the latch being connected by the rod 42 to the hand piece 43 of the lever. The connection for the links 35 and 36 to the levers 32 is preferably a pin and slot connection, the levers being slotted at 44 to engage the pins 45 on the levers, the object being to secure some lost motion in the connection to enable separate releasing of the clutches.

One of the clutch members 27 is provided with an external gear 46, while the other is provided with an internal gear 47 which is secured to the periphery of the clutch member. Otherwise, the clutch members are substantially duplicates. The gear 25 is arranged to mesh with the external gear 46, while the gear 26 is arranged to mesh with the internal gear 47. These gears being of different proportions secure a different speed. It will be obvious that when the right-hand clutch is actuated, the car will be driven in a direction opposite to that in which it will be driven when the left-hand clutch is actuated, and by the variations in the proportions of the gears the variations in speed are secured.

It is sometimes of advantage in cars of this type to drive the car backward for a short distance, and it can be done by these connections without reversing the engine. The clutch connection illustrated is substantially that illustrated in our companion case filed concurrently herewith, and while it is particularly adapted for use in this relation, other clutch means might be utilized, the main object of the invention being to provide a variable or reversing drive by a series of opposite or different traction wheels.

The clutches are held yieldingly in engagement by the coiled springs 48 arranged on the axles so that one end engages the hub of the clutch and the other the bearing member 49. A bearing member 50 is secured to the axle, and between the members 49 and 50 we arrange bearing balls 51. These, in the structure illustrated, are shown in conventional form. The fuel reservoir 52 is preferably supported on the gallows frame between the engine and the gallows frame.

The brake shoes 53 are pivoted at 54 to one of the longitudinal sills 1. These are connected by oppositely arranged links 55 to the rod 56, which is arranged to reciprocate through the bearing 57. On the upper end of the rod 56 is a foot piece 58 so that the operator, by stepping upon the foot piece, throws the brake shoes into engagement. These details are substantially those described in our accompanying application referred to.

We show a modification of this structure in Figs. 6 and 7, in which but a single clutch is made use of. Where it is not necessary that the car be reversed on the track, it is desirable that the same be as light as possible, and this is accomplished by the structure appearing in Fig. 6. To change the direction of this car it is lifted from the track and turned about. The structure of the clutch is illustrated at the left hand end of Fig. 6, where an external gear is shown. As there is only one clutch to actuate, it is done by a single lever 31', which is connected direct, as indicated in Fig. 7, in place of by intermediate link and lever. The numerals on the same parts are indicated in Fig. 6, the same as in Fig. 2, and the similar parts have a prime placed after the numerals. The lower end of the lever 31' terminates in the fork 31'' which engages the grooved collar 30.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever into and out of gear; an explosion engine arranged in front of said gallows frame, centrally of the hand car and between the front wheels thereof; a shaft driven by said engine, said shaft extending the width of the hand car and into proximity with the traction wheels at each side; a gear on each end of said shaft; a clutch member arranged within each of the opposite traction wheels of said car, positioned to contact and engage a suitable friction surface between the tread and web of said wheel, each clutch member having a hub surrounding the hub of each said wheel; an external gear on the hub of one of said clutch members and an internal gear on the clutch member of the opposite traction wheel arranged in mesh with the pinions on said shaft; a spring on the axle for each of said clutch members to urge the same into contact with said wheel; a grooved collar with a forked lever for controlling each of said clutch members; a centrally-located lever with link connections to the levers for controlling said clutches, said links being provided with slotted connec-



tions to permit of lost motion; means for adjusting the said central lever whereby either clutch can be thrown into engagement whereby the car may be driven forward or reversed, all coacting substantially as described and for the purpose specified.

2. In a structure of the class described, the combination with a hand car; an explosion engine arranged between the front wheels thereof; a shaft driven by said engine, said shaft extending the width of the hand car and into proximity with the traction wheels at each side; a gear on each end of said shaft; a clutch member arranged within each of the opposite traction wheels of said car, positioned to contact and engage a suitable friction surface between the tread and web of said wheel, each clutch member having a hub surrounding the hub of each said wheel; an external gear on the hub of one of said clutch members and an internal gear on the clutch member of the opposite traction wheel arranged in mesh with the pinions on said shaft; a spring on the axle for each of said clutch members to urge the same into contact with said wheel; a grooved collar with a forked lever for controlling each of said clutch members; a centrally-located lever with link connections to the levers for controlling said clutches, said links being provided with slotted connections to permit of lost motion; means for adjusting the said central lever whereby either clutch can be thrown into engagement whereby the car may be driven forward or reversed, all coacting substantially as described and for the purpose specified.

3. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever into and out of gear; an explosion engine arranged in front of said gallows frame, centrally of the hand car and between the front wheels thereof; a shaft driven by said engine, said shaft extending the width of the hand car and into proximity with the traction wheels at each side; a gear on each end of said shaft; a clutch member arranged to co-act with the friction surface on the corresponding traction wheel of said car; an external gear secured to one of said clutch members and an internal gear secured to the opposite clutch member arranged to mesh with the gears on the opposite ends of said shaft; a centrally-located lever connected by suitable links, there being a lost motion connection in the said links whereby they can be thrown into engagement as desired, all coacting substantially as described and for the purpose specified.

4. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever,

of means for throwing the said hand lever into and out of gear; an explosion engine arranged in front of said gallows frame, centrally of the hand car and between the front wheels thereof; a shaft driven by said engine, said shaft extending the width of the hand car and into proximity with the traction wheels at each side; a gear on each end of said shaft; a clutch member arranged to coact with the friction surface on the corresponding traction wheel of said car; an external gear secured to one of said clutch members and an internal gear secured to the opposite clutch member arranged to mesh with the gears on the opposite ends of said shaft; means for controlling said clutch members independently, all coacting substantially as described and for the purpose specified.

5. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever; means for throwing the said hand lever into and out of gear and locking the lever when disengaged; an engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged within the traction wheel of said car positioned to contact and engage a suitable friction surface between the tread and web of said wheel; a hub on said clutch member surrounding the hub of said wheel; a gear on the hub of said clutch member meshing with the said pinion; a spring on the axle for urging the said clutch member into contact with the said wheel; a grooved collar with a forked lever for controlling said clutch member; a ball thrust bearing at the outer end of said clutch spring, coacting substantially as described and for the purpose specified.

6. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever into and out of gear; an engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged within the traction wheel of said car positioned to contact and engage a suitable friction surface between the tread and web of said wheel, a hub on said clutch member surrounding the hub of said wheel; a gear on the hub of said clutch member meshing with the said pinion, a spring on the axle for urging the said clutch member into contact with the said wheel; a grooved collar with a forked lever for controlling said clutch member; a ball thrust bearing at the outer end of said clutch spring, coacting substantially as described and for the purpose specified.

7. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever



into and out of gear and locking the lever when disengaged; an engine, a shaft driven by said engine; a gear on said shaft; a clutch member arranged within the traction wheel of said car positioned to contact and engage a suitable friction surface between the tread and web of said wheel, a hub on said clutch member surrounding the hub of said wheel; a gear on the hub of said clutch member meshing with the said pinion; a spring on the axle for urging the said clutch member into contact with the said wheel; a grooved collar with a forked lever for controlling said clutch member, coacting substantially as described and for the purpose specified.

8. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever into and out of gear; an engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged within the traction wheel of said car positioned to contact and engage a suitable friction surface between the tread and web of said wheel, a hub on said clutch member surrounding the hub of said wheel; a gear on the hub of said clutch member meshing with the said pinion; a spring on the axle for urging the said clutch member into contact with the said wheel; a grooved collar with a forked lever for controlling said clutch member, coacting substantially as described and for the purpose specified.

9. In a structure of the class described, the combination with a hand car, of an explosion engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged within the traction wheel of said car positioned to contact and engage a suitable friction surface between the tread and web of said wheel, a hub on said clutch member surrounding the hub of said wheel; a gear on the hub of said clutch member meshing with the said pinion; a spring on the axle for urging the said clutch member into contact with the said wheel; a grooved collar with a forked lever for controlling said clutch member; a ball thrust bearing at the outer end of said clutch spring, coacting substantially as described and for the purpose specified.

10. In a structure of the class described, the combination with a hand car, of an explosion engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged within the traction wheel of said car positioned to contact and engage a suitable friction surface between the tread and web of said wheel, a hub on said clutch member surrounding the hub of said wheel; a gear on the hub of said clutch member meshing with the said pinion; a spring on the

axle for urging the said clutch member into contact with the said wheel; a grooved collar with a forked lever for controlling said clutch member, coacting substantially as described and for the purpose specified.

11. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever into and out of gear and locking the lever when disengaged; an engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged to coact with a suitable friction surface on the said traction wheel; a gear secured to the said clutch member meshing with the gear on said shaft, and suitable means for controlling said clutch, coacting substantially as described and for the purpose specified.

12. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing the said hand lever into and out of gear; an engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged to coact with a suitable friction surface on the said traction wheel; a gear secured to the said clutch member meshing with the gear on said shaft; and suitable means for controlling said clutch, coacting substantially as described and for the purpose specified.

13. In a structure of the class described, the combination with the traction wheels, of a car body; an engine; a shaft driven by said engine; a gear on said shaft; a clutch member arranged to coact with a suitable friction surface on the said traction wheel; a gear secured to the said clutch member meshing with the gear on said shaft; and suitable means for controlling said clutch, coacting substantially as described and for the purpose specified.

14. In a structure of the class described, the combination with a pair of traction wheels, of an axle therefor; a driving clutch member arranged within each wheel, said wheels being adapted to serve as coacting driven clutch members; an internal gear secured to said driving clutch members; an external gear secured to the other of said driving clutch members; an engine; and driving connections for said gears to said engine whereby the car may be driven in either direction.

15. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing said hand lever into and out of gear, a traction wheel, an engine; a driving clutch member arranged in said traction wheel, said wheel being adapted to serve as a coacting driven clutch member; means for shifting said driving



clutch member into and out of engagement; and driving connections for said driving clutch member to said engine.

16. In a structure of the class described, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing said hand lever into and out of gear, a traction wheel, a driving clutch member arranged within said wheel, said wheel being adapted to serve as coacting driven clutch member; a gear secured to said driven clutch member; an engine; and driving connections for said gear to said engine.

17. In a motor vehicle, the combination with a hand car provided with the usual gallows frame and hand lever, of means for throwing said hand lever into and out of gear, a driving wheel, an axle therefor; and a clutch member slidably mounted on said axle and arranged within said wheel and adapted to be shifted into and out of clutching engagement therewith.

18. In a structure of the class described, the combination with a traction wheel comprising a web and flange; a clutch member having an outwardly projecting peripheral flange arranged within said web and adapted to engage in the angle of the wheel and tread thereof; and driving connections for said clutch member.

19. In a structure of the class described, the combination with a pair of traction wheels, of an engine; a driving clutch member arranged within each of said traction wheels; coacting driven clutch members for said traction wheels; means for shifting either of said driving clutch members into

engaging position; driving gears of different diameters on said driving clutch members; and driving connections therefor to said engine.

20. In a structure of the class described, the combination with a pair of traction wheels, of an engine; a driving clutch member arranged within each of said traction wheels; coacting driven clutch members for said traction wheels; means for shifting either of said driving clutch members into engaging position; and driving connections for said driving clutch members to said engine whereby they are driven in opposite directions.

21. In a structure of the class described, the combination with a pair of traction wheels, of an engine; and driving connections for said engine to each of said traction wheels adapted to be connected or disconnected, said driving connections being adapted to drive said traction wheels at different relative speeds.

22. In a structure of the class described, the combination with a pair of traction wheel, of an engine, and driving connections for said engine to each of said traction wheels, whereby the speed of the car is varied by changing the driving connections from one to the other of said traction wheels.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

WILLIAM S. HOVEY. [L. S.]  
MILTON H. RIX. [L. S.]

Witnesses:

O. R. BAIRD,  
D. C. MIX.