No. 827,408. PATENTED JULY 31, 1906.

P. H. BATTEN.

SELF PROPELLED CAR.

APPLICATION FILED FEB. 2, 1905.

5 SHEETS—SHEET 1.

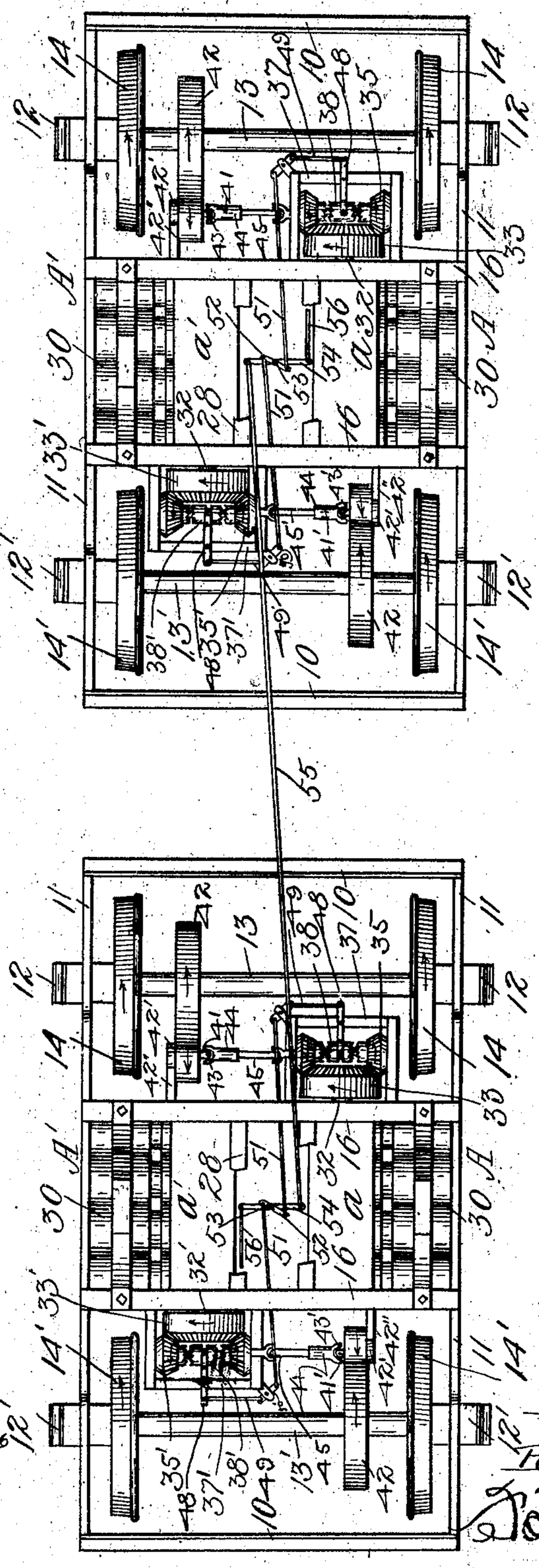

FIG. 1.

Witnesses:
Harry R. Lewis
Ray White.

Inventor
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by Foster Bain
Atty.

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5 SHEETS—SHEET 2.

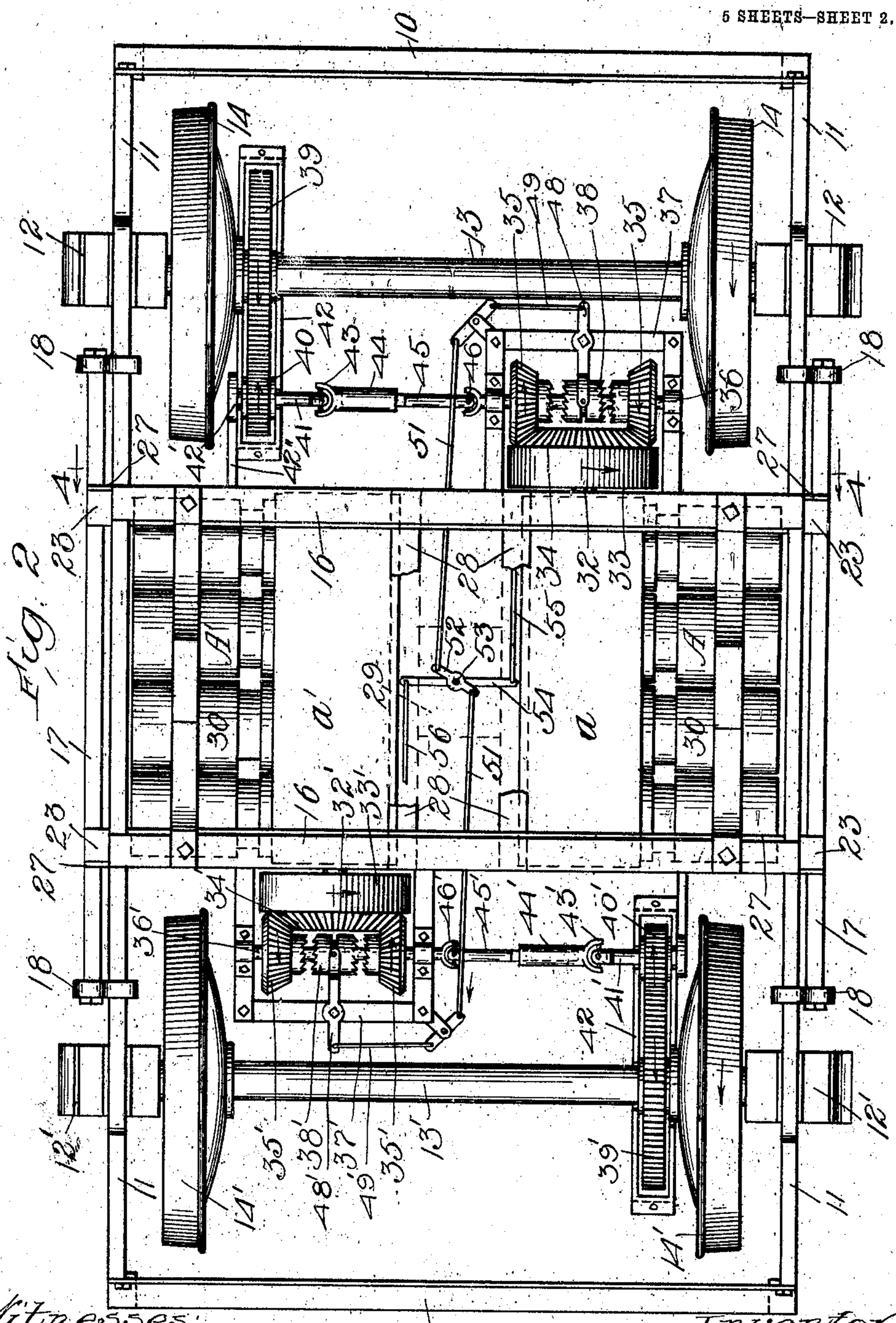


Fig. 2.

Witnesses:
Harry R. Lubke
Ray White

Inventor:
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5 SHEETS—SHEET 3.

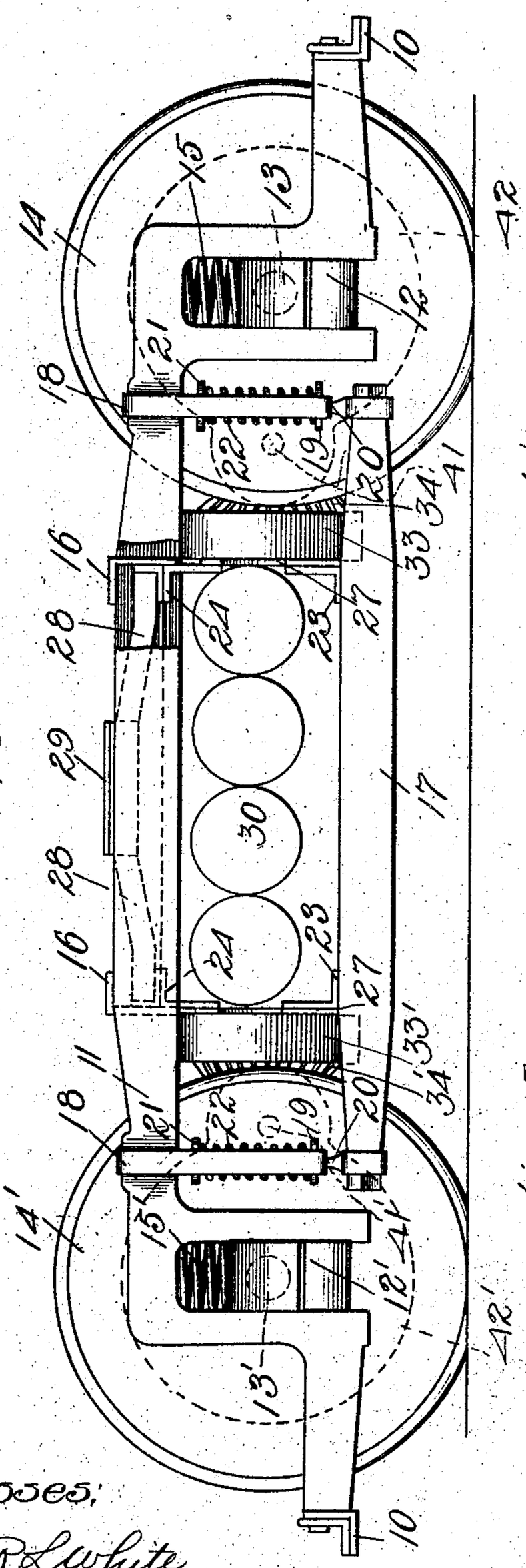


Fig. 3.

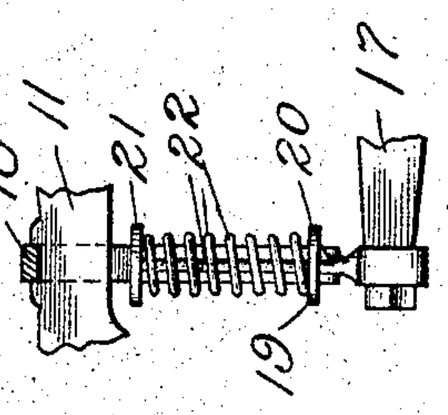


Fig. 6

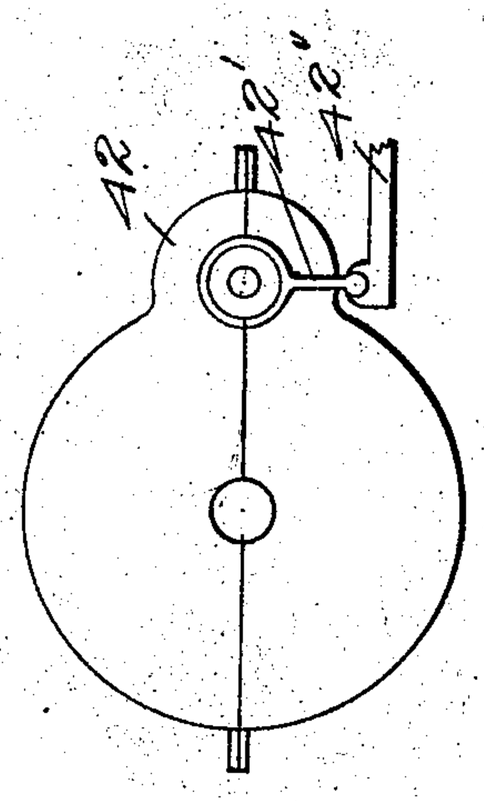


Fig. 5.

Witnesses:

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Inventor:

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No. 827,408. PATENTED JULY 31, 1906.

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5 SHEETS—SHEET 4.

Fig. 4

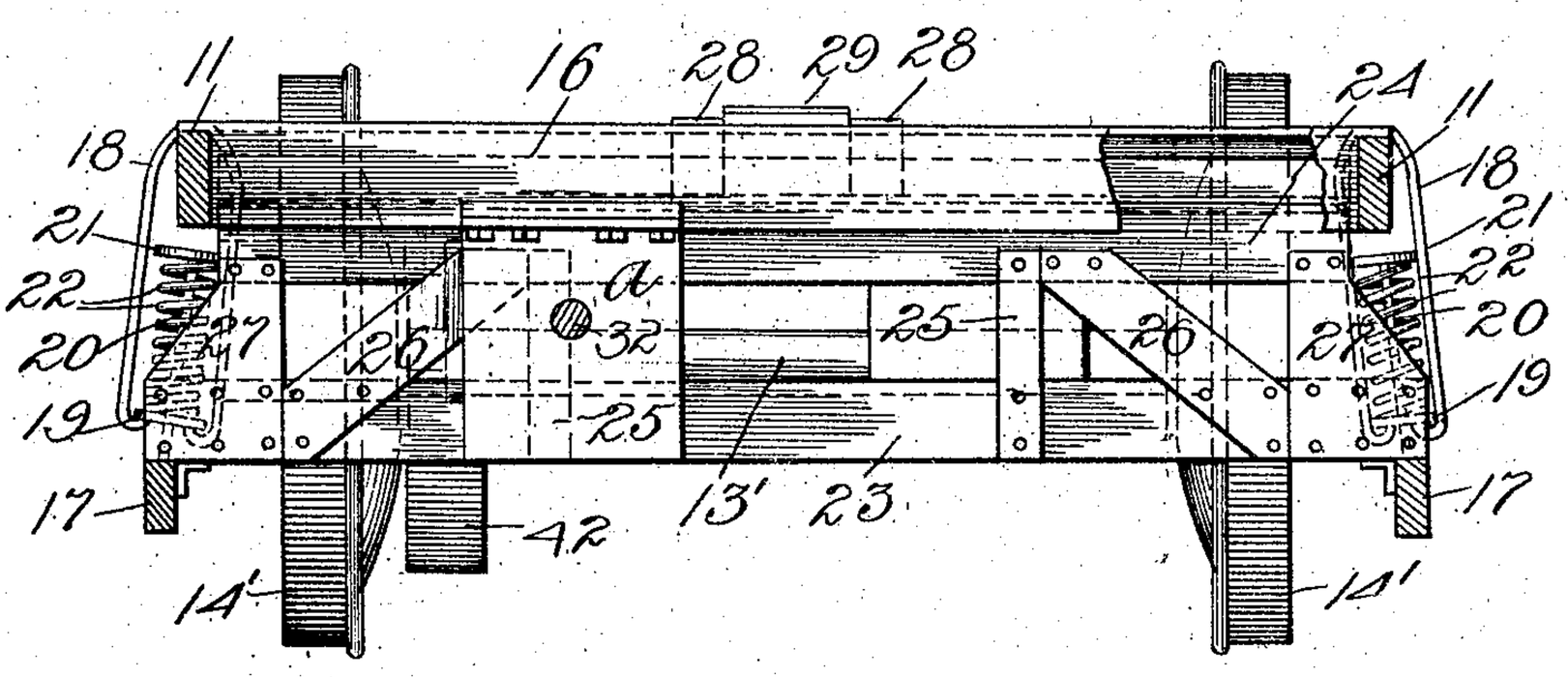
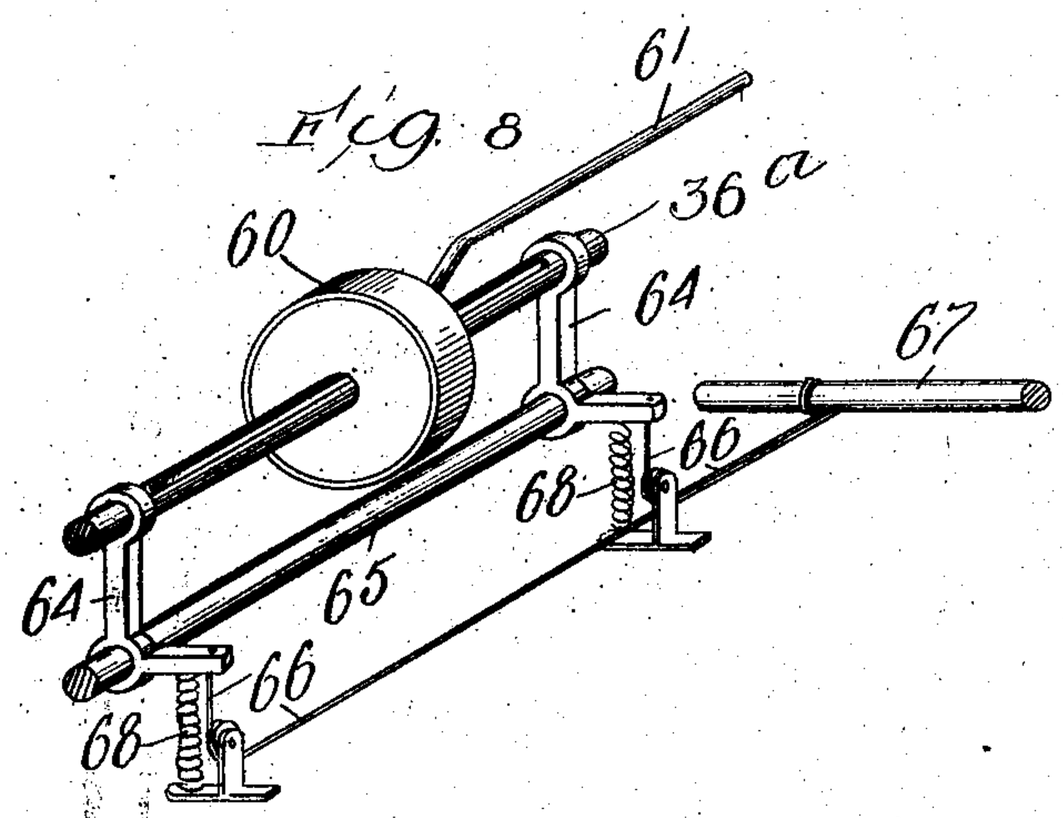



Fig. 8




Witnesses:

Harry R. Liebite

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Inventor:

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By Dorsey Baird Atty.

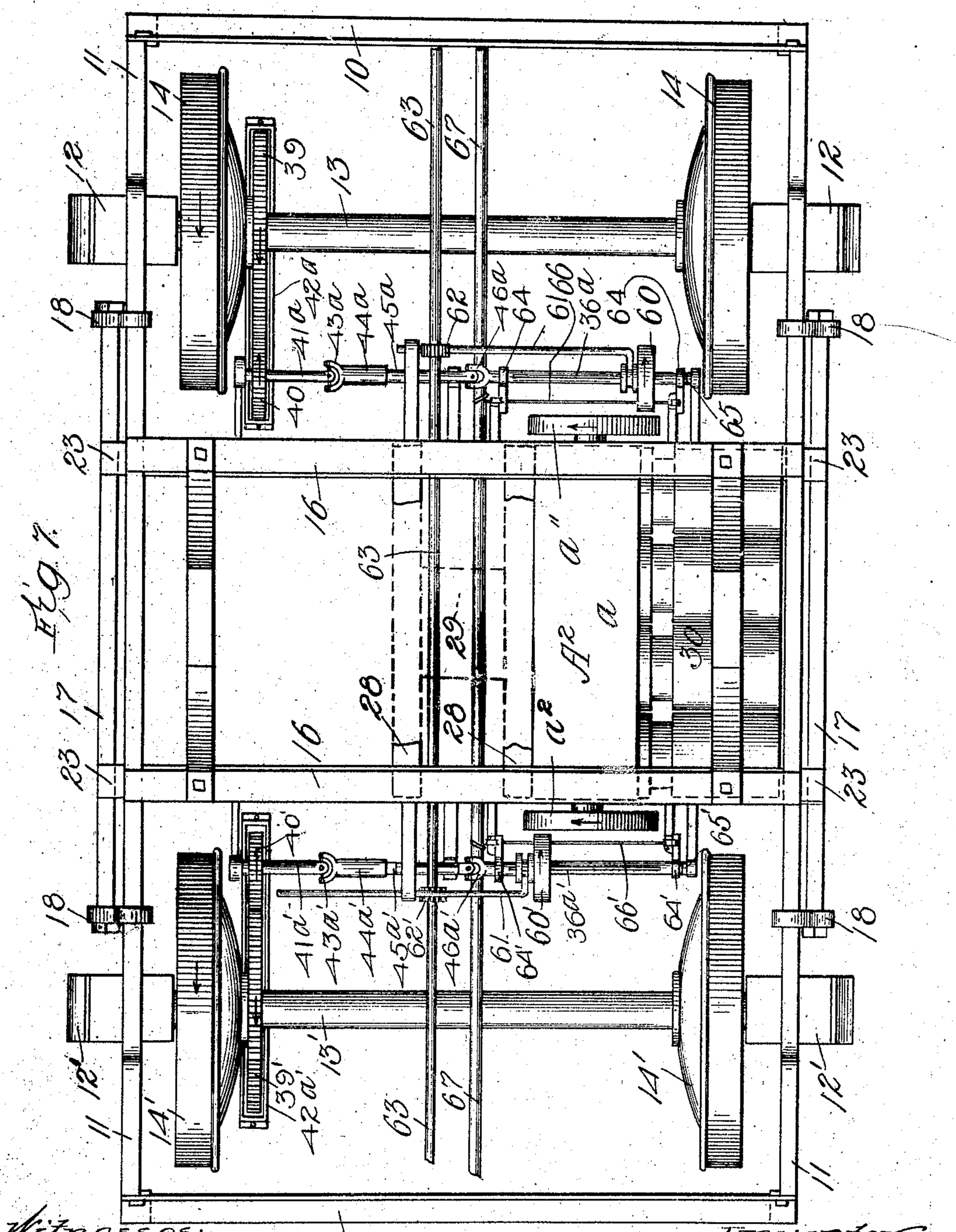
No. 827,408. PATENTED JULY 31, 1906.

P. H. BATTEN.

SELF PROPELLED CAR.

APPLICATION FILED FEB. 2, 1905.

5 SHEETS—SHEET 5.




Witnesses:
Harry R. Lovlite
Ray White.

Inventor:
Percy K. Batten.
By Foley Bain Atty.

# UNITED STATES PATENT OFFICE.

PERCY H. BATTEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO HOWARD H. GROSS OF CHICAGO, ILLINOIS.

## SELF-PROPELLED CAR.

No. 827,408. Specification of Letters Patent. Patented July 31, 1906.

Application filed February 2, 1905. Serial No. 243,801.

*To all whom it may concern:*

Be it known that I, PERCY H. BATTEN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Self-Propelled Cars; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in self-propelled cars, and more particularly to cars propelled by mechanical motors, such as rapid-combustion engines.

One object of my invention is to provide a construction wherein the motor is carried by the truck, and more specifically by the truck-bolster.

A further object of my invention is to provide a suitable connection between an engine mounted as aforesaid in the truck-bolster with the traction wheel or wheels of the truck.

A further object of my invention is to provide for the employment of a pair of independent engines upon each truck; and other and further objects of my invention will become apparent from the following description.

In the drawings, wherein two embodiments of my invention are illustrated, Figure 1 is a plan view of a pair of trucks equipped and connected in accordance with my invention. Fig. 2 is a plan view of one of the trucks. Fig. 3 is a side elevation of the truck. Fig. 4 is a section on line 4 4 of Fig. 2. Fig. 5 is a side view of the gear-casing and associated parts. Fig. 6 is a detail of the equalizer-spring arrangement. Fig. 7 is a plan view of a truck, showing the application of a friction-drive; and Fig. 8 is a perspective detail of a portion of the friction-gear rigging.

Throughout the drawings like characters of reference refer always to like parts.

In the drawings, 10 10 indicate the end pieces of a truck-frame, and 11 11 the side pieces thereof, of well-known construction, affording pedestals or guides for the journal-boxes 12 12 and 12′ 12′, wherein the axles 13 and 13′ of pairs of wheels 14 and 14′ (which I will arbitrarily term, respectively, the "front" and "rear" pairs of wheels) find bearing, said journal-boxes having associated therewith the journal-box springs 15 15′, whereon the truck-frame is yieldingly supported.

16 16 indicate the transoms connecting the side pieces 11 11.

17 17 indicate the equalizer-bars, yieldingly suspended from the side bars 11 and adapted for vertical play, connection being herein shown as conveniently afforded through the hangers 18, connected with the side bars 11 and each carrying a perforated base-plate 19, through which extends a stem 20, affixed at its lower end to the equalizer-bar 17 and bearing at its upper end a spring-cap 21, between which and the base-plate 19 is arranged the equalizer-spring 22.

23 23 indicate the lower bolster-beams suitably secured to the equalizer-bars 17, and 24 24 indicate the upper bolster-beams, arranged in sliding fit between the transoms 16 16 and short enough for suitable play transversely of the truck. The upper and lower beams of each face of the bolster are preferably rigidly connected by open trusswork, such as that shown, wherein 25 and 26 are vertical and inclined struts and 27 27 are gusset-plates at the ends of the beams.

28 28 indicate the center-bearing arch-bars carrying the center-bearing block 29 and secured to the bolster-beams 24.

30 30 indicate the side-bearing bridges.

It will be seen that the construction described provides a hollow bolster of skeleton trusswork supported in the truck-frame for vertical and lateral movement relative thereto and relative to the wheels by which the truck-frame is resiliently supported.

Within the hollow bolster, preferably constructed as described, I mount the motor or motors for driving the traction wheel or wheels of the truck and provide for such a flexible connection between the motor or motors and the traction wheel or wheels as will accommodate itself to the relative changes in position between said wheel or wheels and the bolster without affecting the constant transmission of power from the motor to the traction wheel or wheels.

In practice I prefer that both axles of the truck should be driven, and to this end I have herein shown in Figs. 1 to 4 an arrangement whereby power is transmitted to each axle from an independent motor, both of said motors being mounted in the truck-bolster, and in Fig. 7 I have shown an arrangement for driving both axles from a single motor. Obviously, however, if preferred, a single motor might be employed to drive a single

axle of a single traction-wheel under the teachings of my present application.

Referring now to the showing made in Figs. 1 to 4, A and A′ indicate in general motors, preferably mechanical motors, (as distinguished from electrical motors,) and which I prefer shall be rapid-combustion engines. The motors are herein shown as horizontal four-cylinder gas-engines, having, respectively, rigid crank-boxes *a* and *a′*. The two engines A and A′ are preferably arranged at opposite sides of the bolster with their crank-boxes *a a′* suitably separated and their cylinders extending outward toward opposite sides of the truck-frame. Preferably the engines have their crank-boxes bolted direct to the beams 23 24 of the bolster, so that they tend to strengthen the bolster construction. The engine A is shown as provided with the main shaft 32, projecting forwardly beyond the bolster and carrying at its front end a fly-wheel 33. The opposite engine A′ is provided with the shaft 32′ and fly-wheel 33′, arranged in rear of the bolster. The engine A is arranged to drive the front axle 13, and the engine A′ the rear axle 13′; but the connections between the respective engines and the axles being duplicates I will describe only the connection of the engine A with its axle 13, it being understood that the opposite engine is in like manner connected with the axle 13′, like parts being indicated by like numerals of reference, differentiated by the exponent prime (′). 34 indicates a beveled gear secured to or formed upon the face of the fly-wheel 33, and 35 35 indicate beveled pinions meshing therewith and loosely mounted upon a counter-shaft section 36. The shaft-section 36 is supported in suitable bearings in a framework, generally indicated as at 37, and carried by the bolster. Suitable clutch mechanism for clutching either of the pinions 35 to the shaft-section 36 is provided, such clutch member being herein indicated at 38. It will be understood that said member 38 is slidable longitudinally relative to the shaft-section 36, but is fixed against rotation relative thereto. A flexible and extensible driving connection is afforded between the shaft-section 36 and the axle 13, and in the specific embodiment herein shown 39 indicates the gear, and 40 the pinion, of a reduction-gearing, the gear 39 being affixed to the shaft 13 and the pinion 40 mounted on the counter-shaft section 41, which bears in the gear-case 42, supported on shaft 13 and positioned by link 42′, pivotally connected to the bracket 42″, carried by the bolster. It will be understood that the simple gearing shown is illustrative merely and that any desired speed-change gearing might be employed. Shaft-section 41 is connected by a universal joint 43 with shaft-section 44, into which telescopically interfits the shaft-section 45, making such connection with the shaft-section 44 as to be rotatable therewith, and said shaft-section 45 is connected by universal joint 46 with the shaft-section 36. The joint thus provided being universally movable and longitudinally extensible is adapted to afford constant driving connection between the engine and the shaft to be driven and to permit free play of the engine with the movable bolster without interfering with the efficiency of the drive from the engine to the axle. Where two trucks are employed, each having mounted thereon, as described, two separate engines, means should be provided for operating the clutches which control the connection of the engines with their axles simultaneously and in proper direction. As a simple means of operating the clutches I have shown the clutch member 38 as provided with a shipper-lever 48, connected by link 49 with the end of a diagonally-disposed lever 50, the opposite end of which is connected with the longitudinally-extending rod 51, connected to one side of a transverse lever 52, pivotally secured, as upon a shaft 53, to which is also secured the operating-lever 54. The opposite side of said lever, it will be understood, is connected through like connections with the clutch member 38′, like parts being indicated by like numerals with the exponent prime (′). The operating-bars 54 54 of the front and rear trucks are preferably connected together by a link 55 for simultaneous actuation, and suitable connection, herein suggested by the broken links 56 56, are extended from said operating-levers 54 to suitable controlling mechanisms at each end of the car, (not herein specifically shown,) but which will readily occur to those skilled in the art.

It will readily be apparent to those skilled in the art that by properly connecting the various links to proper ends of the levers motion in one direction may be imparted to all of the wheels in whatever direction the various engines are constructed to run.

While I have herein described the gear connection between the engines and their shafts as being positive in their nature, I desire it to be understood that friction-drive may be employed, if desirable, and therefore I have shown in Fig. 7 means for driving the axle from the engine through friction-gearing. In the construction shown, a single engine $A^2$ is provided, having two fly-wheels $a^2$ $a''$, the gearing connection between said fly-wheels $a''$ $a^2$ and the respective axles 13 13′ of the truck being afforded through friction-gearing, shown substantially as described in my prior patent, No. 782,591, dated February 14, 1905. In general the gearing for transmitting power from each fly-wheel to its associated axle comprises a friction-disk 60, slidable on and rotatable

with the counter-shaft section $36^a$, which said shaft-section is connected by universal joint $46^a$ with a shaft-section $45^a$, telescoping in but connected for rotation with the shaft-section $44^a$, the latter having a connection through the universal joint $43^a$ with the shaft-section $41^a$, bearing in the gear-casing $42^a$, supported like the casing 42 heretofore described. Suitable means are provided for shifting the friction-wheels 60 and 60′ transversely relative to their friction-wheels $a^2$ $a''$—such, for instance, as the rack-bars 61 61′, meshing with the pinion 62, carried by a longitudinal shaft 63, with which it will be understood are associated controlling mechanism operable by the driver of the car and not herein specifically shown. Mechanism is also preferably provided for bodily shifting the friction-disks 60 60′ toward and from the fly-wheel, the shaft-section $36^a$ being herein shown as mounted in the rocking levers 64 64, pivoted on a suitably-supported shaft 65 and having their free ends connected, as by cords or cables 66, with a shaft 67 in such manner that the rotation of said shaft in one direction causes the levers 64 to move shaft-section $36^a$ toward the associated fly-wheel, movement of said shaft $36^a$ away from the fly-wheel being accomplished through the agency of suitable spring 68, bearing against the lever 64. It will be understood that suitable mechanism is provided at each end of the car to enable the operator to control the movement of the shaft 67 and that like connections to those described are afforded from shafts 63 and 67 to operate disk 60′, the parts of such connection being indicated by like numerals to like parts described, differentiated by the exponent prime (′).

While I have for purposes of a full disclosure herein described and shown certain specific embodiments of my invention, it will be understood that the showings made are illustrative merely; but I do not desire to be understood as limiting the embodiment of my invention to the specific apparatus shown and described further than as specified in the claims, as it will be apparent that the spirit of my invention might find expression in many forms of apparatus differing widely in construction from those herein illustratively shown.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a car, the combination with the wheels, a frame, and a bolster connected with the frame for vertical and lateral movement relative thereto, of a motor carried by the bolster, and mechanical connections between the motor and the wheels arranged to permit the vertical and lateral movements of the motor with the bolster, without failure of transmission.

2. In a car, the combination with the wheels, a frame, and a bolster connected with the frame for vertical and lateral movement relative thereto, of a gas-engine carried by the bolster and flexible and extensible driving connections between a moving part of the engine and a driving-wheel.

3. In a car, the combination with the wheels, and the frame having side bars and transverse transmission, of equalizer-bars, spring-links suspending said equalizer-bars from the frame, for vertical and lateral movement relative thereto, upper and lower bolster-beams supported on said equalizer-bars, a motor having its casing secured to the upper and lower bolster-beams, and flexible and extensible driving connections between the motor and a wheel.

4. In a self-propelled car, the combination with a truck comprising wheels, a frame, and a bolster, of a mechanical motor carried by the bolster and providing a shaft projecting at each end beyond the bolster, and driving connections between each end of the shaft and a corresponding traction-wheel, said driving connection comprising friction-gearing and flexible extensible shafting.

5. In a self-propelled vehicle, running-gear comprising wheels, a truck-frame and a bolster mounted for play in the truck-frame, of a motor carried by the bolster, and a driving connection between said motor, and a traction-wheel comprising suitable shafting, a slip-joint, and two universal joints, substantially as described.

6. In a self-propelled car, a truck comprising wheels, a frame, spring connections between the wheels and frame, and a truck-bolster supported in said frame for vertical and lateral movement relative thereto, an engine carried by said bolster having two fly-wheels, flexible and extensible connections between one fly-wheel and one traction-wheel and flexible and extensible connections between the opposite fly-wheel and another traction-wheel.

7. In a self-propelled vehicle, the combination with a truck comprising wheels, a frame, and a bolster supported in the frame for vertical and lateral movement relative thereto, of a mechanical motor carried by the bolster, and provided with a shaft, a friction-gear element thereon, a coacting friction-gear element, and flexible and extensible driving connections between said second gear element and a traction-wheel.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

PERCY H. BATTEN.

In presence of—
GEO. T. MAY, Jr.,
MARY F. ALLEN.