No. 705,854. Patented July 29, 1902.

A. F. MADDEN.

GENERATING APPARATUS FOR CAR LIGHTING.

(Application filed Feb. 24, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig.1.

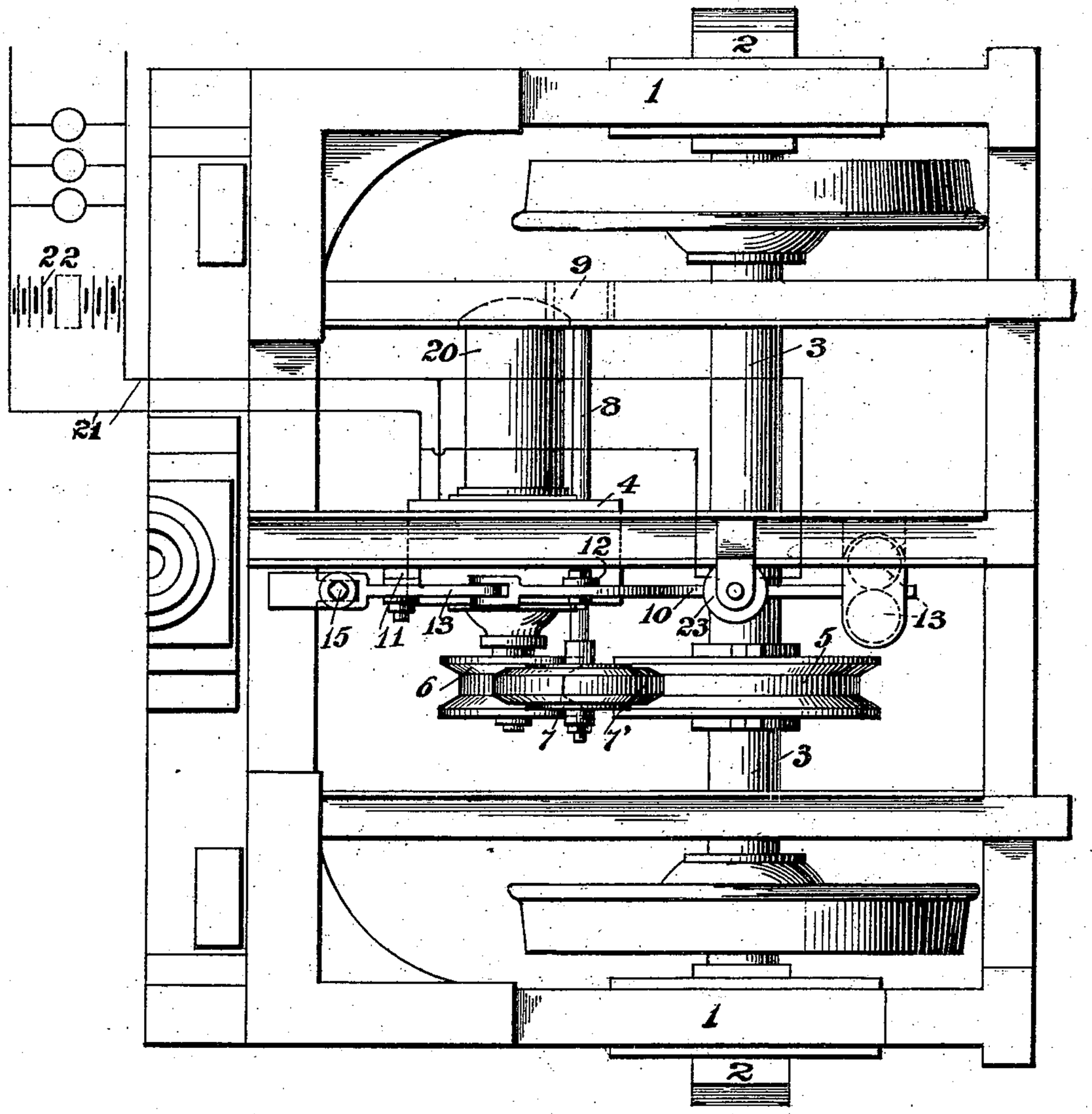

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Fig. 2.

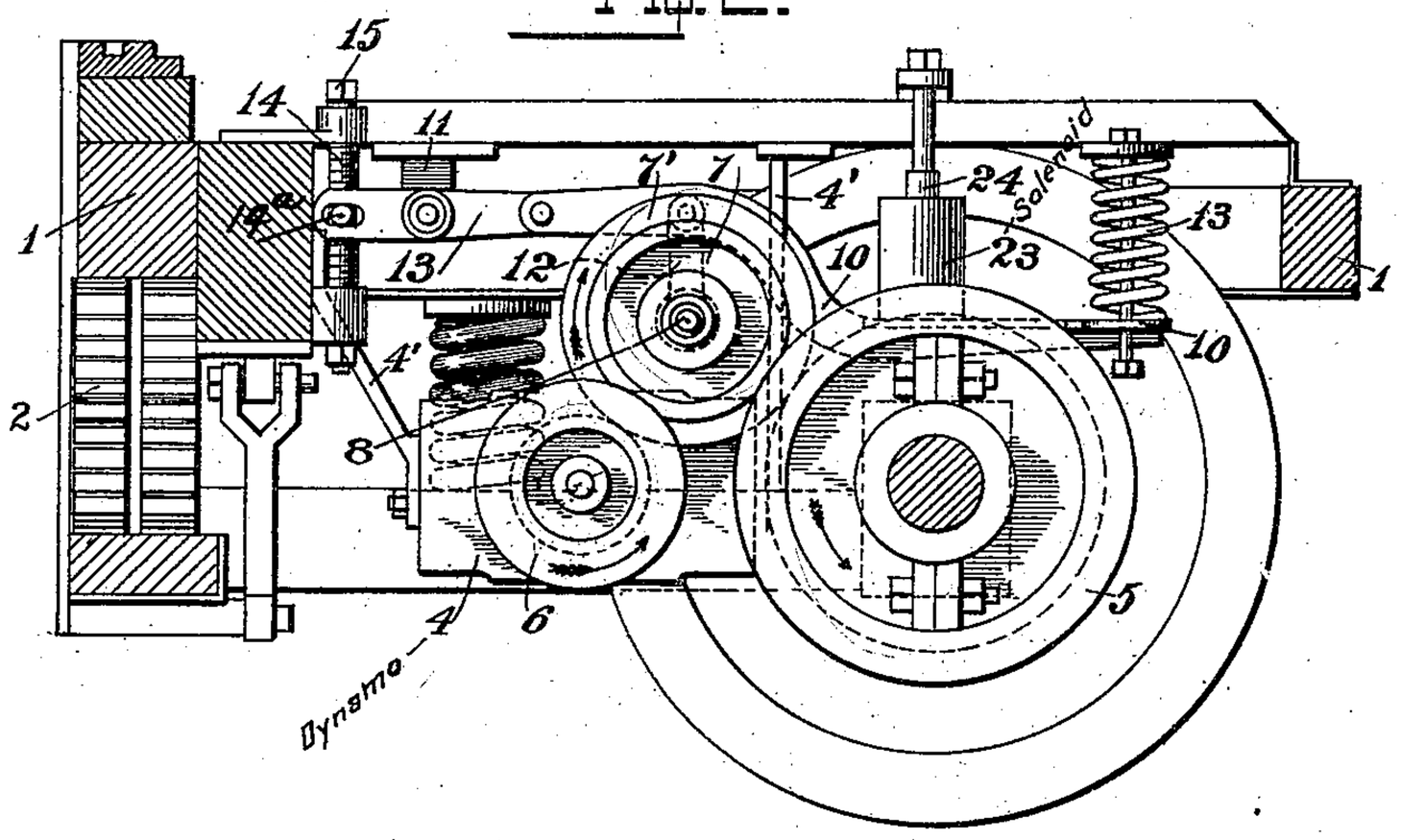
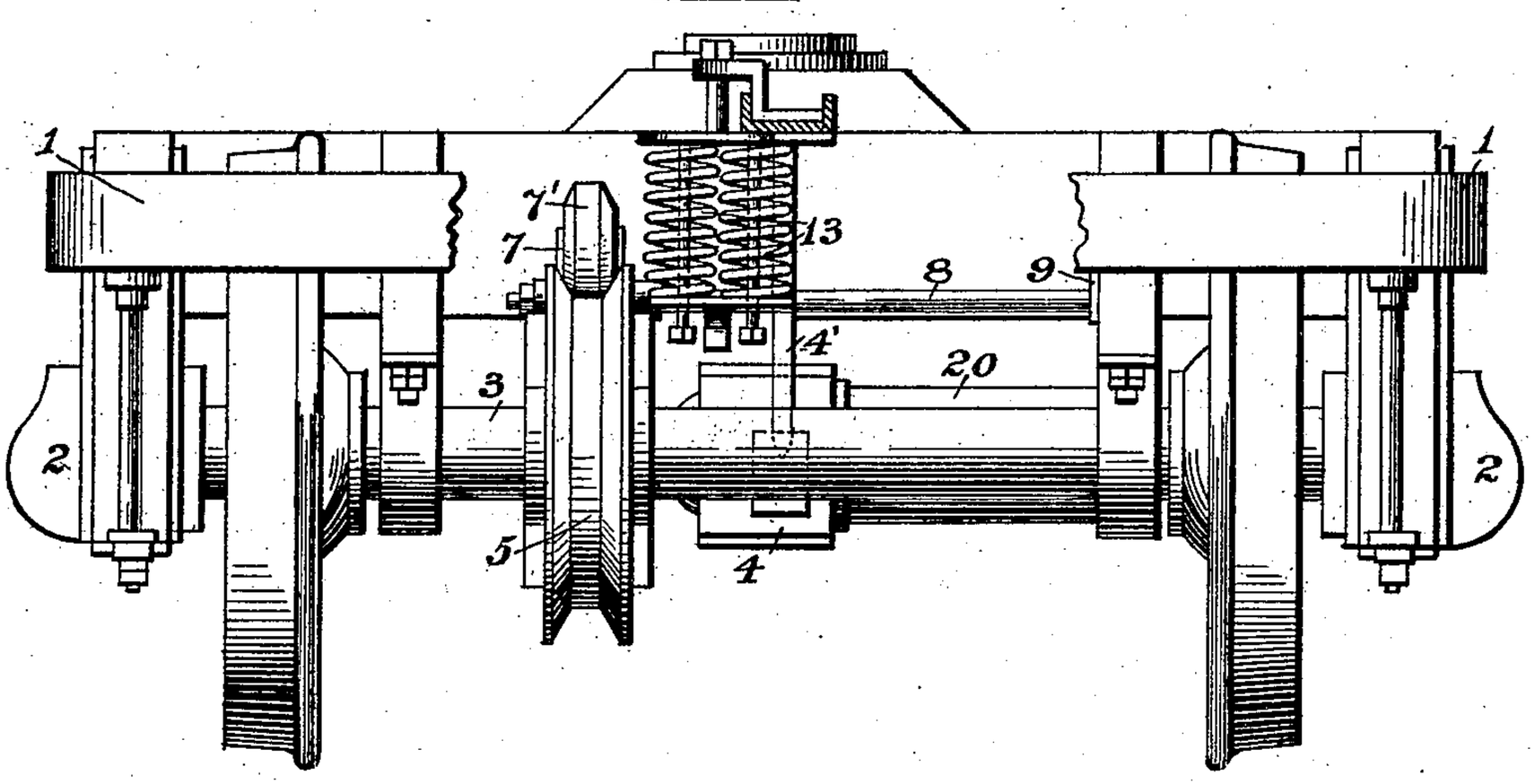


Fig. 3.



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GENERATING APPARATUS FOR CAR-LIGHTING.

SPECIFICATION forming part of Letters Patent No. 705,854, dated July 29, 1902.

Application filed February 24, 1902. Serial No. 95,321. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. MADDEN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Generating Apparatus for Car-Lighting, of which the following is a specification.

This invention relates to improvements in generating apparatus for car or vehicle lighting; and its object is to provide means for driving the generating-dynamo from a car or vehicle axle without subjecting the dynamo to the jarring or pounding action which would result from direct connection and without the intervention of belting, which has been found to be unreliable and subject to rapid deterioration.

In my present invention the dynamo is supported on the usual car-truck and is therefore spring-supported relatively to the vehicle-axle, so as to be fully protected from jarring. Transmitting-wheels are fastened on the vehicle-axle and on the dynamo-shaft, and an intermediate wheel is arranged to engage with the aforesaid wheels and to drive the dynamo from the car-axle, while permitting free relative movement. I also provide means for adjusting the pressure with which the aforesaid wheels engage one another and for regulating such pressure automatically to prevent overspeeding of the dynamo.

In the accompanying drawings, Figure 1 is a plan view of a portion of a vehicle-truck with my invention applied thereto. Fig. 2 is a longitudinal vertical section of same. Fig. 3 is an end elevation of the truck.

The truck-frame 1 is yieldingly supported by the usual spring devices 2 on the car-axle 3, and the dynamo 4 is fastened by suitable means—for example, braces or straps 4′—on said truck-frame. A wheel 5 is fast on the car-axle 3, and another wheel 6 is fast on the dynamo-shaft, while a third wheel 7 is arranged to engage with these wheels and is yieldingly supported by a freely-swinging shaft 8, journaled in a swivel-bearing or hanger 9 on the truck-frame. This wheel 7 is preferably intermediate in diameter between the two wheels 5 6 and is arranged to engage both said wheels obliquely, the tangential lines of contact (indicated by dotted lines) being substantially at or not less than at right angles, so as to avoid any binding action when the wheels 5 6 are rotating in the direction of the arrows in Fig. 2. With the parts in this relation the amount of pressure on the wheels is substantially the same whether the car-axle be moving in one direction or the other, so that the dynamo is operated in the same manner irrespective of the direction of movement of the car.

The wheels 5, 6, and 7 engage with one another by an elastic frictional engagement effected by a tire of rubber or equivalent material on one or more of the wheels. I prefer to make the wheels 5 6 with flanged metal tires and to make the intermediate wheel 7 with a rubber tire 7′, that is wedge-shaped or tapered and enters in the groove or between the flanges of the wheels 5 6, thus obtaining great transmitting capacity without undue pressure. The wheel 7 may be removed readily for repairs to its tire, and said tire may be formed as a solid ring. Instead of a rubber tire I may use a tire formed of wooden segments or other suitable material.

To press the wheel 7 onto the wheels 5 6, I provide a pressure-applying device consisting of spring 13 and a lever 10, engaged by said spring and pivotally supported from a bridge-piece 11, attached to truck-frame 1, said device being connected by a pivoted link 12 with the shaft 8 of said wheel, which shaft runs freely in a bearing in said link. Means for adjusting the position and pressure of this lever are provided, consisting of an adjustable block 14^a, on which said lever is pivoted and acting as a nut on a screw-shaft 14, mounted to turn in a bracket on the truck-frame and provided with operating means, such as a wrench-hold 15. This shaft may be prolonged upwardly, so as to be accessible from the interior of the car. When it is desired to disconnect the dynamo entirely from the driving-axle, the lever 10 is raised by turning this screw-shaft until the wheel 7 is free of one or both of the wheels 5 6. By turning this shaft so as to screw down the pivot or bearing block 13 the lever 10 may

be caused to press the wheel 7 with any desired amount of pressure on the wheels 5 6. This pressure should be such that under normal or average conditions of car-speed and of load on the consumption-circuit the pressure of contact of the wheels 5 6 7 will be sufficient to transmit the requisite power for driving the dynamo without slipping; but when the car is traveling at an unusually high speed the tendency will be to generate greater electromotive force and a correspondingly-greater current in the dynamo than is desirable for the consumption-circuit, and in such case the frictional contact between the wheels will allow a certain amount of relative slip, so as to tend to keep the dynamo speed and the generated electromotive force within fairly-equable limits.

It will be understood that other means will be provided for open-circuiting the dynamo when its speed is below that necessary for generation of electromotive force sufficient for the consumption-circuit, particularly if the latter be connected with a storage battery. Such means may be contained within the box 20 on the dynamo, but is not herein shown, as it forms no part of my present invention and is now in common use for this purpose. The consumption-circuit is indicated at 21 in Fig. 1, and 22 indicates the storage battery connected therewith.

To further control the pressure of the contacting wheels 5 6 7, I provide a solenoid 23, attached to lever 10 and coöperating with a core 24, connected to the truck-frame, to pull the lever 10 against the pressure of the spring 13. This solenoid is connected in or across the circuit connection leading to the consumption-circuit or to the storage battery and is therefore responsive to the electromotive force and also to the current generated by the dynamo, and as both of them are dependent on the speed of the dynamo this device is also responsive to such speed. Therefore when the dynamo attains a certain limit of speed this solenoid will act to pull off the wheel 7 to relieve the pressure of contact to a certain extent, and thereby enable relative slip of the wheels sufficiently to prevent overspeeding of the dynamo.

It will be noted that there is nothing in the above-described construction that interferes with the free movement of the car-axle relatively to the car-truck. As the axle moves up and down the wheel 7 swings laterally on the pivoted link 12 and the lever 10 is moved but slightly, while the pressure from spring 13 is applied at all times with considerable leverage to the frictional contact. The elastic nature of the tire 7′ maintains a smooth and even contact and driving connection during these movements.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo-shaft, said transmitting-wheel mounted to swing in an arc which intersects the peripheries of both the said wheels.

2. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo, the tangential lines of contact between the several wheels being inclined to one another at an angle not less than a right angle.

3. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo-shaft and mounted in the free end of a swinging link, said link connected to a lever flexibly mounted on the vehicle-frame.

4. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo-shaft and mounted in the free end of a swinging link, said link connected to a lever flexibly and adjustably mounted on the vehicle-frame.

5. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo-shaft and mounted in the free end of a swinging link, said link connected to a lever flexibly mounted on the vehicle-frame, said lever having spring connection at one end with the vehicle-frame and connected at its other end end with adjusting means to adjust the pressure of the said transmitting-wheel on the friction-wheels of the dynamo and vehicle running-gear.

6. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a screw-threaded rod mounted on the vehicle-frame, a block engaging said rod, a link pivoted on the vehicle-frame, one end of said link connected to said block, a spring-pressed lever having one end connected to said pivoted link and the other end having a spring connection with the vehicle-frame, a swinging arm sup-

ported at one end from said lever intermediate its ends and carrying at its other end a transmitting-wheel to engage the friction-wheels on the dynamo-shaft and the vehicle running-gear.

7. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo-shaft and mounted in the free end of a swinging link, said link connected to a lever flexibly mounted on the vehicle-frame, said lever having spring connection at one end with the vehicle-frame and connected at its other end with adjusting means, and having connected therewith an electrical device energized from the dynamo to control the pressure of the transmitting-wheel upon the friction means.

8. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel engaging the wheels on the running-gear and dynamo-shaft, said transmitting-wheel being free to swing toward one of said friction-wheels and from the other, but to maintain contact with both of said friction-wheels.

9. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel flexibly supported from the vehicle-frame and engaging the said friction-wheels, said transmitting-wheel being free to move in a direction from one of said friction-wheels toward the other while maintaining contact with both of said friction-wheels.

10. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel flexibly supported from the vehicle-frame and engaging the said friction-wheels, said transmitting-wheel being free to move in a direction from one of said friction-wheels toward the other while maintaining contact with both of said friction-wheels, means to adjust the pressure of said transmitting-wheel upon the friction-wheels.

11. The combination of a rotary part of a vehicle running-gear, a friction-wheel mounted thereon, a dynamo flexibly and independently mounted with respect to the running-gear, a friction-wheel on the dynamo-shaft, a transmitting-wheel flexibly supported from the vehicle-frame and engaging the said friction-wheels, said transmitting-wheel being free to move in a direction from one of said friction-wheels toward the other while maintaining contact with both of said friction-wheels, means operated from the interior of the vehicle to adjust the pressure of said transmitting-wheel upon the friction-wheels.

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Witnesses:
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