W. I. THOMSON.

MEANS FOR DRIVING GENERATORS FROM CAR AXLES.

APPLICATION FILED NOV. 13, 1902.

986,656. **Patented Mar. 14, 1911.**

2 SHEETS—SHEET 1.

Fig. I

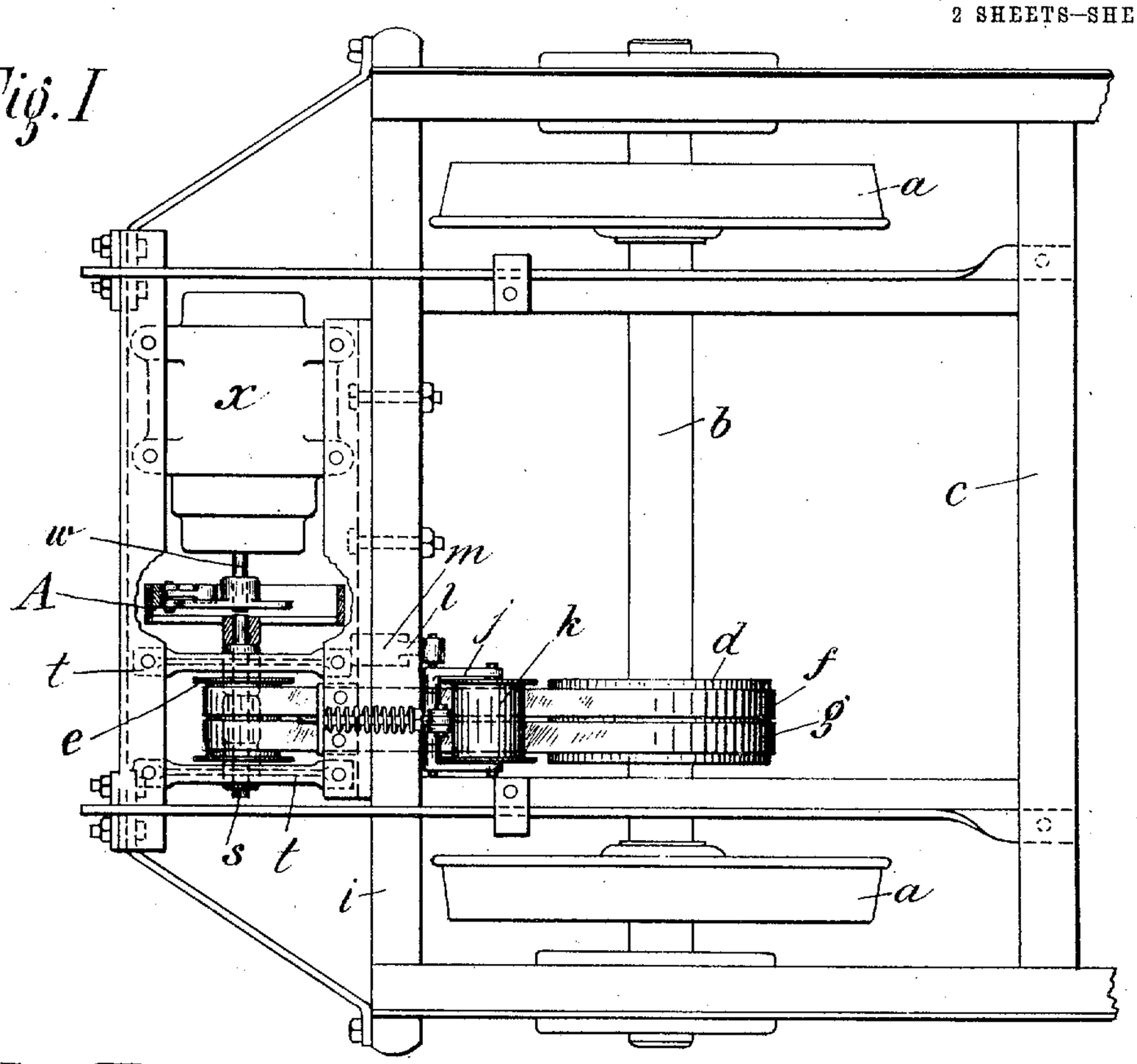
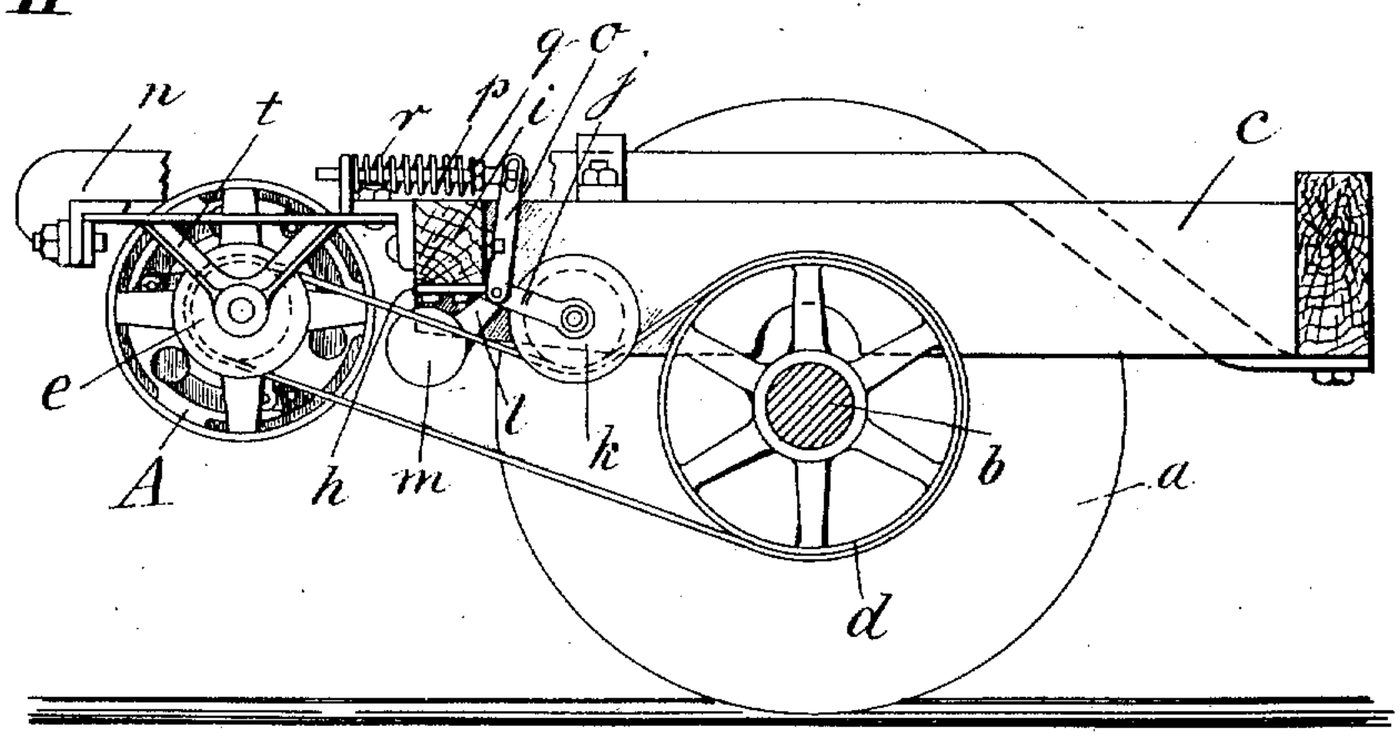


Fig. II



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2 SHEETS—SHEET 2.

Fig. III

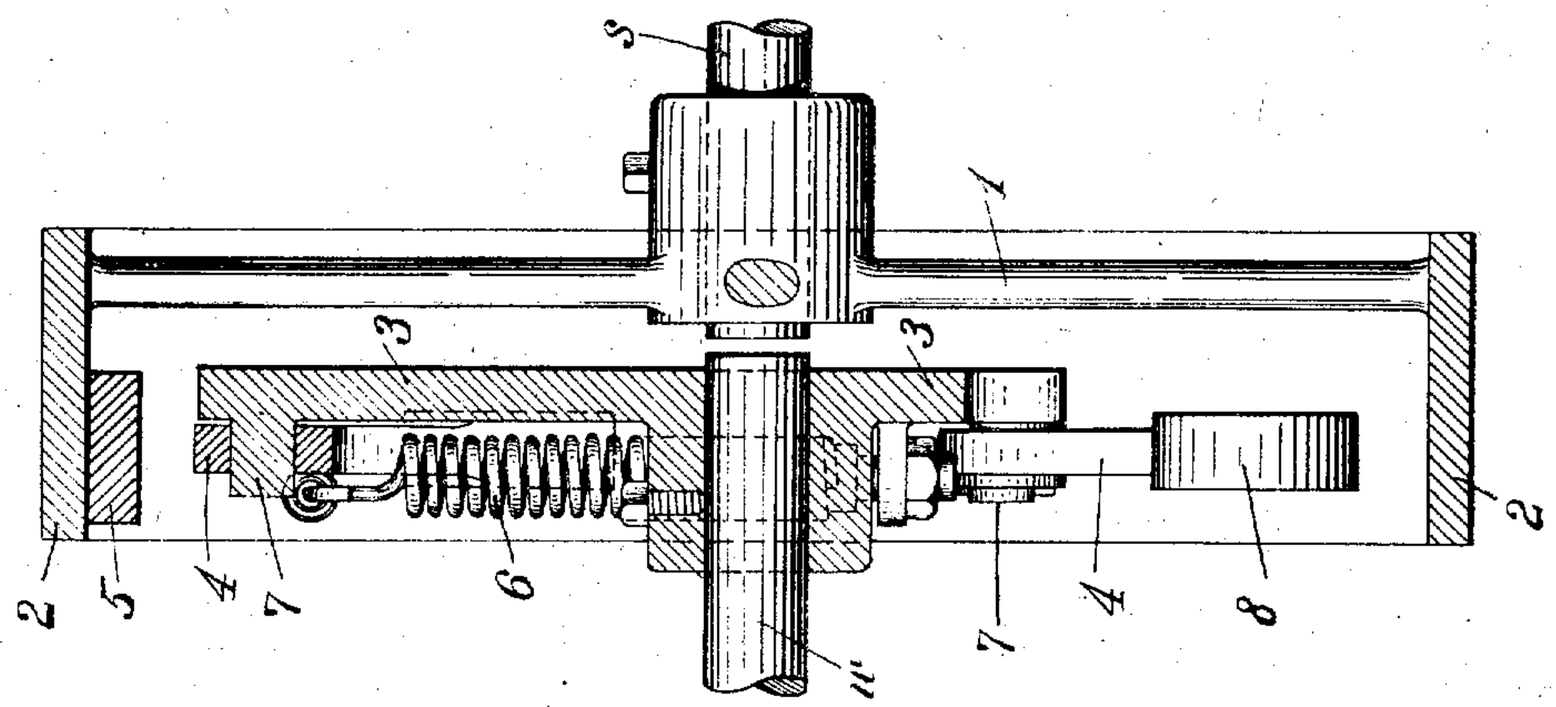
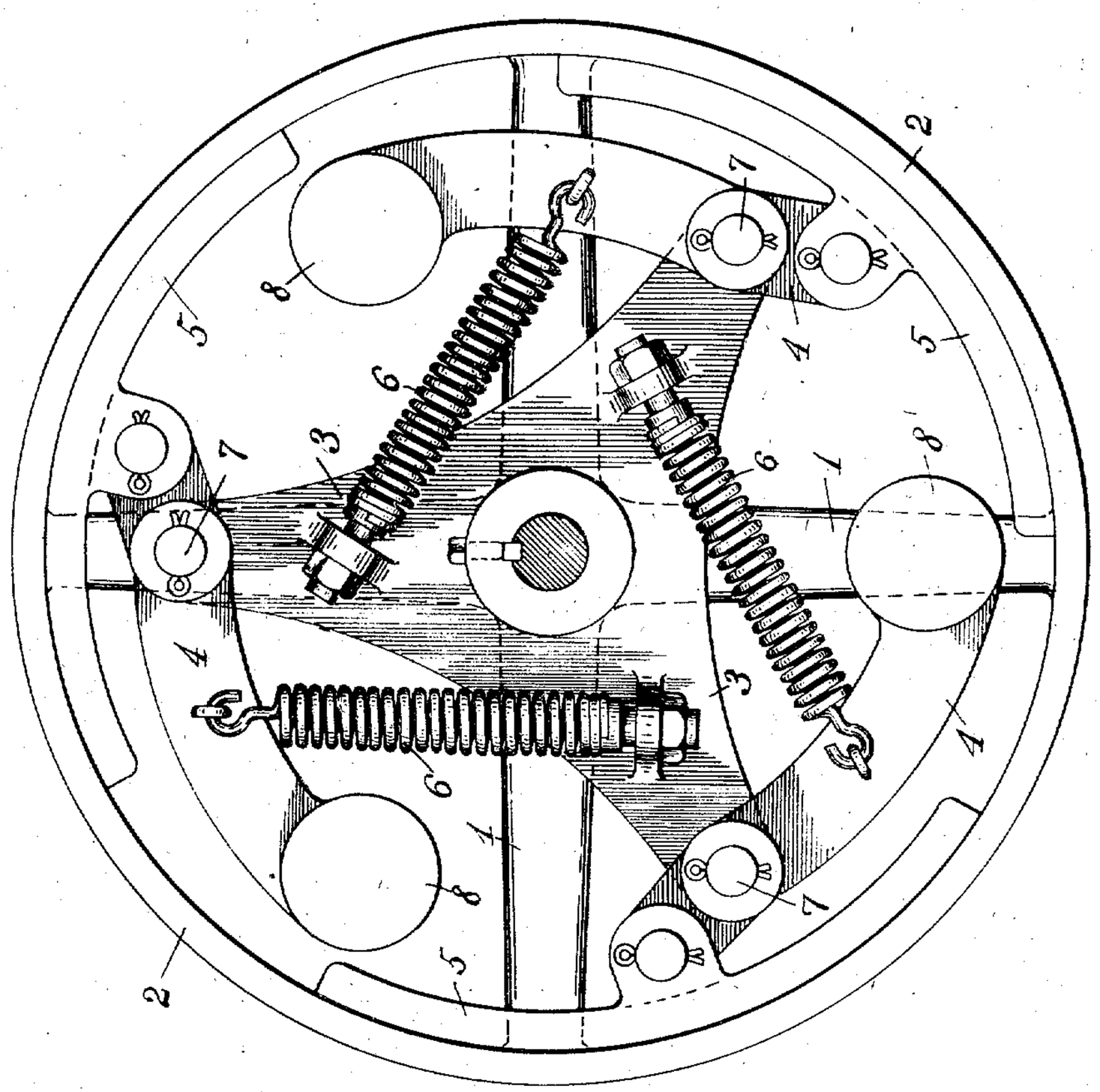


Fig. IV



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UNITED STATES PATENT OFFICE.

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MEANS FOR DRIVING GENERATORS FROM CAR-AXLES.

986,656. Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed November 13, 1902. Serial No. 131,076.

To all whom it may concern:

Be it known that I, WILLIAM I. THOMSON, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Means for Driving Generators from Car-Axles, of which the following is a full, clear, and exact description.

My invention relates to means for driving generators from car axles, that is to say my invention relates particularly to this subject, but I would have it understood that I intend to include within the terms employed such analogous organisms as within the limitations imposed by the state of the art may be properly included, my intention being to give a full, clear and exact description of one mode of carrying out my invention as required by law, leaving the interpretation as to the scope of the invention to be determined by the state of the art. With this understanding I will proceed to describe the form of my invention shown in the drawings.

In these drawings—Figure I is a plan view partly broken away showing an organism embodying my invention; Fig. II is a sectional side elevation of the construction shown in Fig. I; Fig. III is an enlarged sectional view of the frictional driving gear or clutch preferably employed by me; and Fig. IV is an elevation thereof.

In the embodiment of my invention shown in these figures I have illustrated a construction adapted for use in situations where the driving member is subject to variations in speed of a gradual character, and in this sense the construction is to be differentiated from constructions in which the driving force abruptly changes, such as where a motive power is employed which varies during different periods or cycles of a single revolution, such, for instance, as would be produced in the operation of an ordinary gas engine as a driving force. With these explanations I will now proceed to describe in detail the construction shown.

In the drawings *a* indicates a car wheel and *b* the axle thereof.

c indicates the truck frame.

Mounted upon the axle *b* is a pulley *d*, or if found desirable the pulley *d* may be divided and a plurality of pulleys employed. The pulley *d* is belted to a pulley *e* by a plurality of belts *f*, *g*, that is to say preferably by a plurality of belts. A suitable belt tightening device is, or may be, employed, which may be described as follows: A bracket *h* is bolted to the end piece *i* of the truck frame or otherwise suitably mounted, and has pivoted thereto a three arm supporter comprising a bifurcated arm *j* carrying a belt tightening pulley *k*, an arm *l* carrying a weight *m* and an arm *o* connected by pin and slot connection with a thrust rod *p* having a thrust collar *q*, against which a coil spring *r* bears. This belt tightening device bears upon the belt or belts *f*, *g*, and is held thereon with pressure by the spring *r*, the weight *m* serving to provide the necessary moment of inertia.

The pulley *e* is carried upon a short shaft *s* carried by suitable brackets *t* secured to the end piece of the truck frame and to a supplemental frame *n*. This supplemental frame *n*, as clearly shown in Fig. I of the drawings, comprises a pair of longitudinal members extending from beneath a truck cross-member over the end sill and projecting beyond the same and having their free ends connected by a cross-member embraced by inclined braces to the end sill. The shaft *s* drives the shaft *w* of a suitable dynamo *x*, mounted between the cross-member of the supplemental frame and the end sill of the truck, through the medium of a friction transmission gear or clutch designated generally in Figs. I and II by the letter A. It may here be noted that terms of the nature of "outer" are used with reference to a direction outside of or away from the truck. Detailed views of this transmission gear are shown in Figs. III and IV. In these figures it will be observed that a suitable spider 1 is mounted upon the end of shaft *s* and is provided with a rim 2. The dynamo shaft *w* has mounted thereon a spider 3 to which are pivoted suitable arms 4. Each of these arms 4 is provided with a curved shoe 5, which shoes 5 bear against the inner face of the rim 2, being held thereon by the action of suitable springs 6 acting in the rear of the pivotal points 7 of the levers 4. The levers 4 are each provided with weights 8 which serve through the medium of centrifugal action to release the pressure of the shoes 5 against the inner face of the rim 2, as will be explained.

The mode of operation of the construction shown is as follows: Under ordinary cir-

cumstances up to a certain predetermined speed, the shoes 5 are held firmly against the rim 2 by the action of the springs 6, and motion will be transmitted to the dynamo *x* from the axle *b* through the belts *f*, *g*, shaft *s*, transmission gear A and shaft *w*. It is, of course, well known that trains run at variable speeds and start and stop at intervals. So long as the train remains below a certain normal speed the parts will remain in their normal positions, but as soon as the train exceeds a normal speed so as to drive the generator too fast the weights 8 will move outward from the center of rotation against the tension of the springs 6 and thereby relieve the pressure of the shoes 5 against the rim 2. In this manner the pressure being relieved as soon as the rotation of the car axle reaches a critical speed, the dynamo will always be driven at a constant rate of speed, the excess speed within certain limits causing the pressure to be relieved sufficiently to allow the generator to be driven at its predetermined rate of speed, which, of course, will be slower than the speed of rotation of the shaft *s*, and consequently the machine will be frictionally driven. It has been found in practice that as long as the speed of the car axle is kept within certain fairly defined limits, the generator will be driven at a constant speed, thereby dispensing with the necessity of minute regulation of the current output through the medium of other devices.

Certain broad features herein shown and described are shown, described and claimed in my co-pending application Serial No. 285,981 filed November 6, 1905, and accordingly are not claimed herein.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In apparatus of the class described, in combination with a car truck, a pair of longitudinal members mounted upon said truck and projecting beyond the end sill thereof, a generator, means mounting said generator upon the projecting ends of said members, a pair of laterally inclined members extending from the ends of said first members to said truck, and means driving said generator from an axle of said truck.

2. In apparatus of the class described, in combination with a car truck, a pair of longitudinal members mounted upon said truck and projecting beyond the end sill thereof, a generator, means mounting said generator upon the projecting ends of said members, a pair of inclined members extending from the ends of said first members and secured adjacent the end sill of the truck, and means adapted to drive said generator from an axle of the truck.

3. In apparatus of the class described, in combination with a car truck, a pair of longitudinal members extending from beneath a cross-member of the truck-frame and thence over the end sill thereof and projecting beyond said end sill, a generator, means mounting said generator upon the projecting ends of said members, a pair of inclined members extending from the ends of said longitudinal members, and secured adjacent the end sill of said truck, and means driving said generator from an axle of said truck.

4. In apparatus of the class described, in combination, a car truck having longitudinal members extending beyond the end of the truck frame, a cross-bar connecting the ends of said longitudinal members, a generator suspended from said cross-bar, and means adapted to drive said generator from an axle of the truck.

5. In apparatus of the class described, in combination, a car truck having longitudinal members extending beyond the end of the truck frame, a cross-bar connecting the ends of said longitudinal members, a generator suspended from said cross-bar, and a belt connecting the shaft of said generator with an axle of the truck.

6. In apparatus of the class described, in combination, a car truck having longitudinal members extending beyond the end of the truck frame, a cross-bar connecting the ends of said longitudinal members, a generator suspended from said cross-bar, braces extending from said cross-bar to the truck frame, and means adapted to drive said generator from an axle of the truck.

7. In apparatus of the class described, in combination, a pair of longitudinal members extending beyond the truck, a pair of transverse members extending from one to another of said longitudinal members, a generator mounted upon said transverse members outside the truck, and means adapted to drive said generator from an axle of the truck.

8. In apparatus of the class described, in combination, a pair of longitudinal members extending beyond the truck, a transverse member extending from one to another of said longitudinal members, a generator having its outer side supported upon said transverse member, means supporting the other side of said generator at a point inside said transverse member and outside of the truck, and means driving said generator from an axle of said truck.

9. In apparatus of the class described, in combination, a pair of longitudinal members extending beyond the truck, a pair of transverse members extending from one to another of said longitudinal members, a generator mounted upon said transverse members outside the truck, means adapted to drive said generator from an axle of the truck, and a pair of laterally inclined mem-

bers extending from the ends of said longitudinal members to the truck.

10. In apparatus of the class described, in combination with a car truck, a pair of longitudinal members extending from beneath a cross-member of the truck frame and over the end sill thereof and thence beyond said end sill, a pair of inclined members extending from the ends of said longitudinal members and secured adjacent the end sill of the truck, a transverse member extending from one to another of said longitudinal members, a generator having its outer side supported upon said transverse member, and having its inner side supported at a point inside said transverse member and outside the truck, and means driving said generator from an axle of the truck.

11. In apparatus of the class described, in combination, a pair of longitudinal members extending beyond the truck, a transverse member extending from one to another of said longitudinal members, a generator having its outer side supported upon said transverse member, means supporting the other side of said generator at a point inside said transverse member and outside of the truck, means driving said generator from an axle of said truck, and a pair of laterally inclined members extending from the ends of said longitudinal members and secured adjacent the end sill of the truck.

12. In an apparatus of the class described, in combination with a car truck, a pair of longitudinal members mounted upon said truck and projecting beyond the end thereof, a cross-member connecting the ends of said longitudinal members, a generator provided at its opposite sides with projecting portions respectively secured to said cross-member and to the end sill of the truck, and means adapted to drive said generator from an axle of the truck.

13. In apparatus of the class described, in combination with a car truck, a pair of longitudinal members mounted upon said truck and projecting beyond the end sill thereof, a cross-member connecting the ends of said longitudinal members, a generator provided on each side with a pair of projecting portions, said pairs being respectively secured to said cross-member and to an end sill of the truck, and means adapted to drive said generator from an axle of the truck.

14. In apparatus of the class described, in combination with a car truck, a pair of longitudinal members mounted upon said truck and projecting beyond the end sill thereof, a cross-member connecting the ends of said longitudinal members, a generator provided at its opposite sides with projecting portions respectively secured to said cross-member and to the end sill of the truck, means adapted to drive said generator from an axle of the truck, and a pair of laterally inclined braces extending from the ends of said longitudinal members and secured adjacent the end sill of the truck.

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