No. 672,878. Patented Apr. 23, 1901.

J. W. GUILLOTT.

ELECTRIC LIGHTING SYSTEM FOR RAILWAY TRAINS.

(Application filed July 20, 1896.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

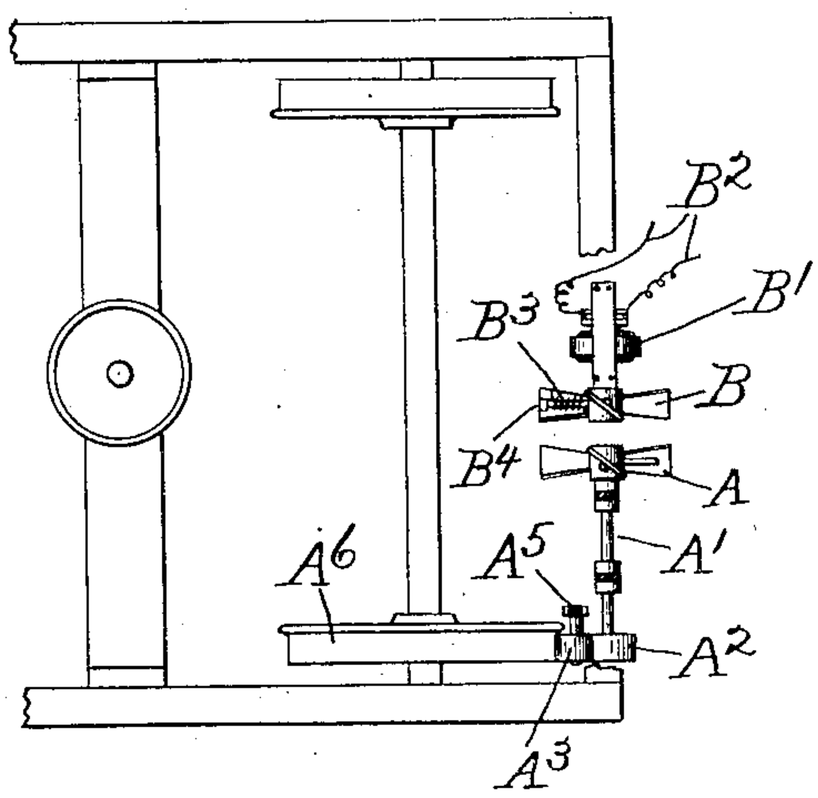


Fig. 2.

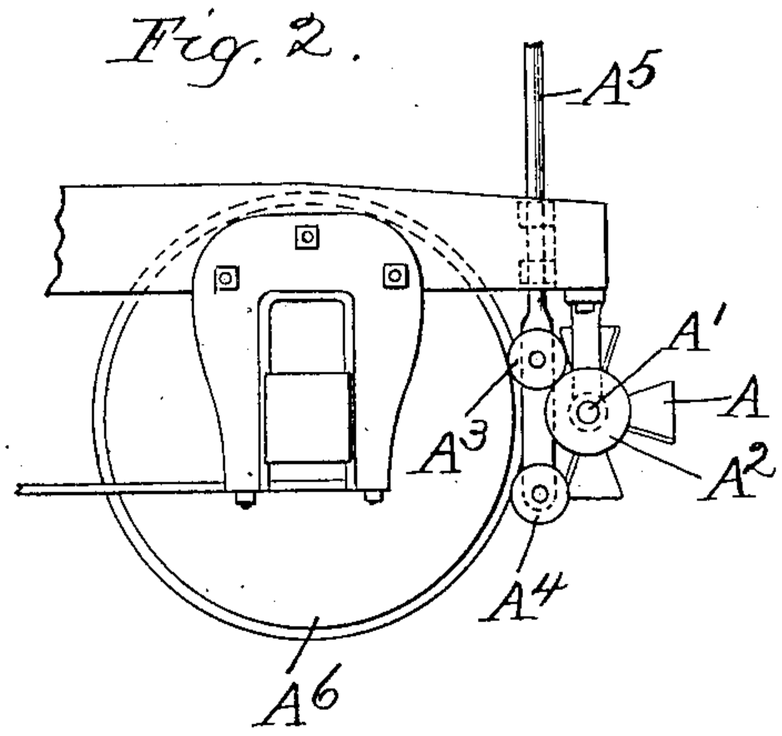


Fig. 3.

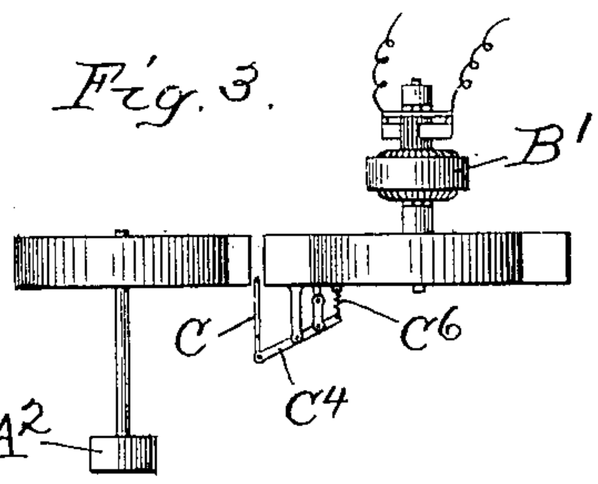


Fig. 6.

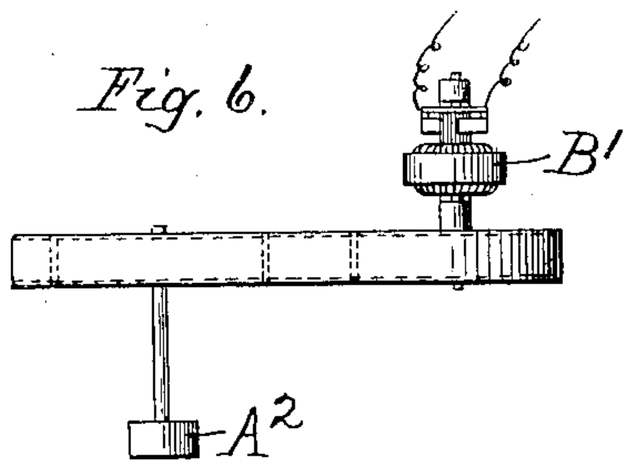


Fig. 4.

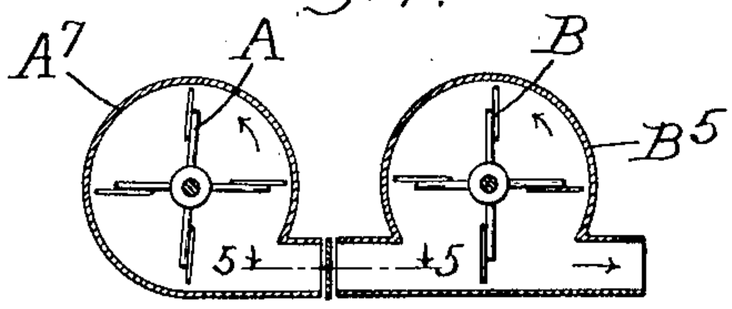


Fig. 7.

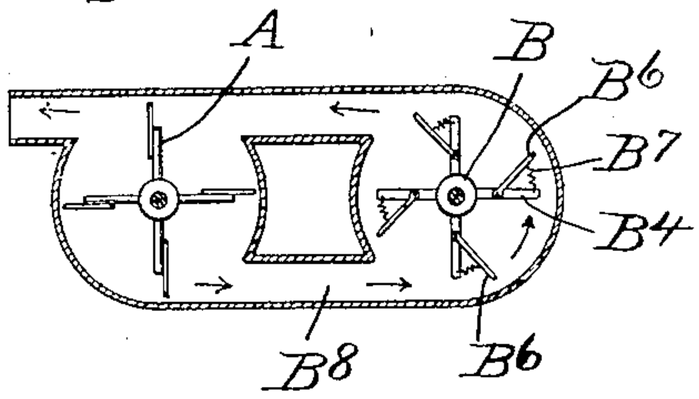
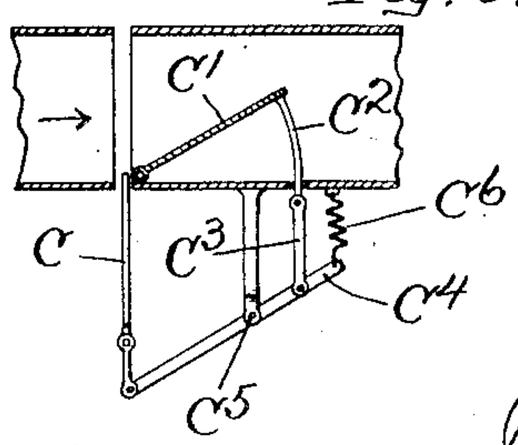


Fig. 5.



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No. 672,878. Patented Apr. 23, 1901.

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ELECTRIC LIGHTING SYSTEM FOR RAILWAY TRAINS.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 8.

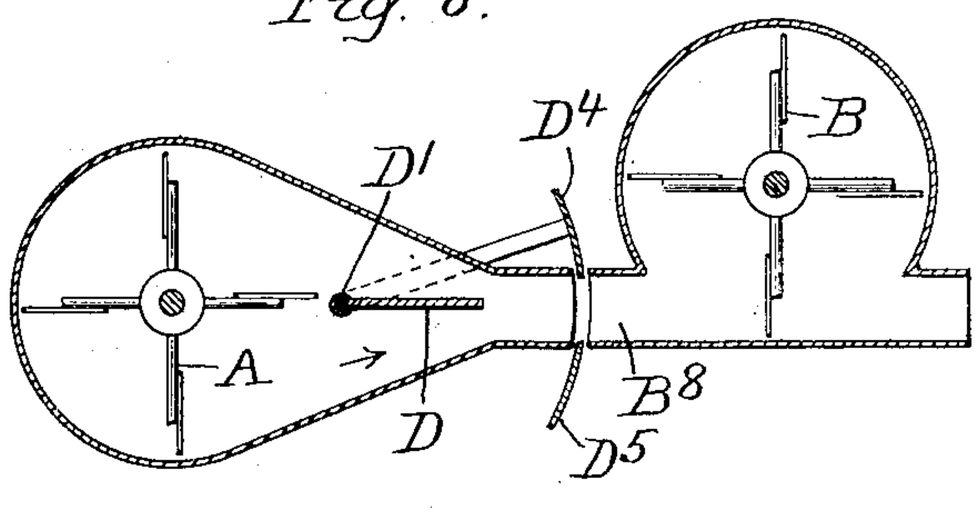


Fig. 9.

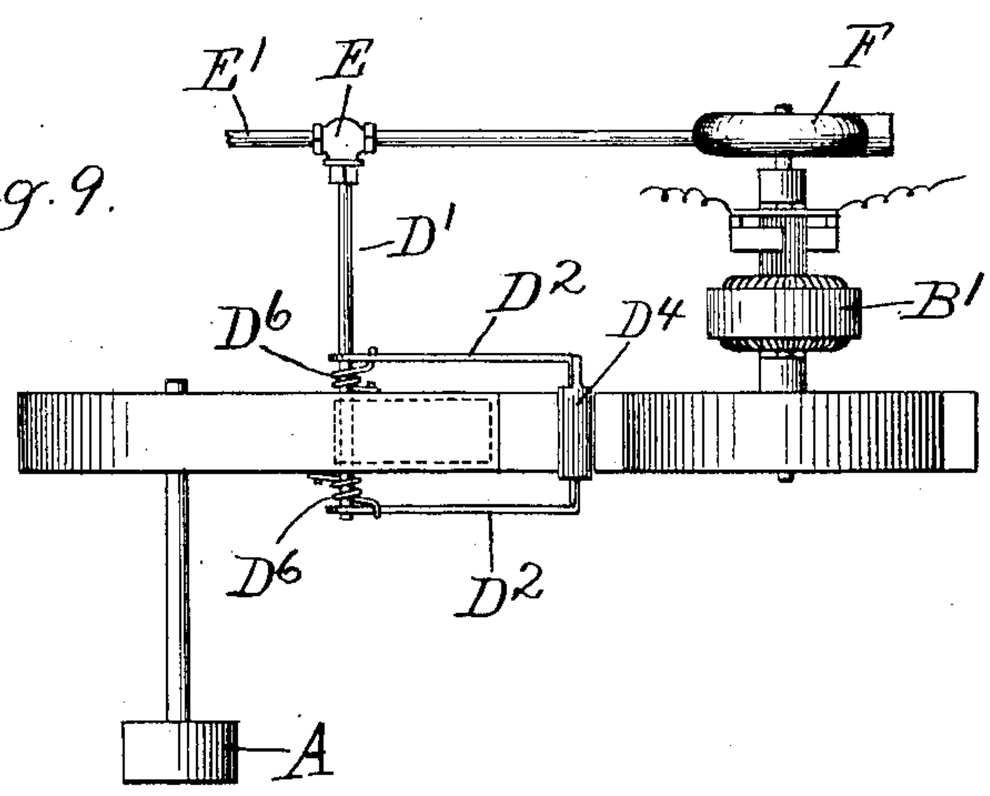


Fig. 10.

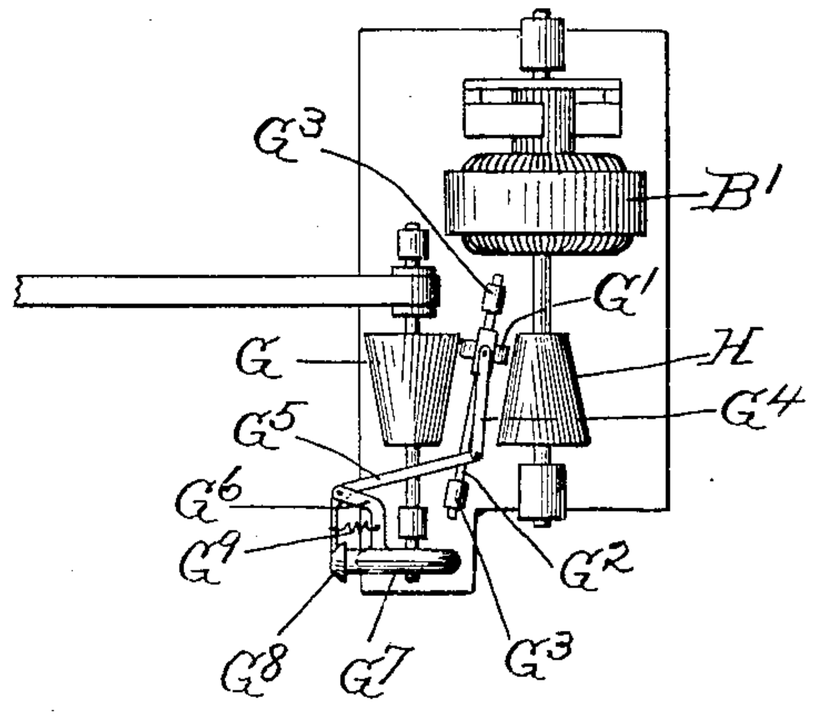
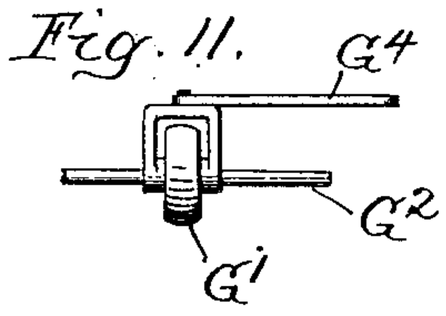


Fig. 11.



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UNITED STATES PATENT OFFICE.

JAMES W. GUILLOTT, OF CHICAGO, ILLINOIS, ASSIGNOR TO GEORGE W. CASS, TRUSTEE, OF SAME PLACE.

ELECTRIC-LIGHTING SYSTEM FOR RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 672,878, dated April 23, 1901.

Application filed July 20, 1896. Serial No. 599,984. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. GUILLOTT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Car-Lighting Devices, of which the following is a specification.

My invention relates to improvements in car-lighting systems, and has for its object to provide the new and improved car-lighting system of which the following is a description, reference being had to the accompanying drawings, wherein—

Figure 1 is a plan view of a portion of the car-truck with one form of my device attached thereto. Fig. 2 is a side view of the same. Fig. 3 is a plan view of a device embodying my invention provided with a regulating mechanism. Fig. 4 is a longitudinal section through the same. Fig. 5 is a section on line 5 5, Fig. 4, the parts being enlarged. Fig. 6 is a plan view of a device having a modified regulating mechanism. Fig. 7 is a longitudinal section through the same. Fig. 8 is a longitudinal section through a device embodying my invention provided with a different form of regulating device. Fig. 9 is a plan view of the same. Fig. 10 shows a generator driven from the axle of the car provided with a regulating mechanism. Fig. 11 is a detail view of the friction-wheel of Fig. 10.

Like letters refer to like parts throughout the several figures.

As shown in Figs. 1 and 2, I provide a fan A, mounted upon a shaft A′, said shaft being connected in any convenient manner to the frame of the car. A pulley A^2 is connected with this shaft. Two friction-pulleys A^3 A^4 are rotatably mounted upon shafts which are connected to the reciprocating arm A^5. This arm projects up into the car and may be moved up or down and held in any desired position. The several parts are so arranged that either of the friction-pulleys A^3 or A^4 may be brought into contact with the car-wheel A^6 and with the pulley A^2, thereby causing said pulley, and hence the fan A, to rotate. It will be seen that the direction of rotation when the friction-pulley A^4 is in contact with the pulley A^2 will be opposite to the direction of rotation when the friction-pulley A^3 is in contact with said pulley A^2. A wind-operated motor B is opposed to the fan A and is operatively connected in any desirable manner with the dynamo-electric machine B′, the wires B^2 of said dynamo-electric machine leading to the translating devices to be operated. It will be seen that when the fan A is operated the air will be set in motion and the motor B will also be operated, causing the armature of the dynamo-electric machine B′ to rotate, thereby generating an electric current. The motor B may be provided with any suitable regulating mechanism—as, for example, such as is shown in my application filed May 15, 1896, Serial No. 591,706. I have shown the motor in Fig. 1 as provided with one of these devices, consisting of a coil-spring B^3, connected at one end with the vane of the motor and at the other end with the rod B^4, to which said vane is connected, said vane being mounted upon said rod so as to be free to move with relation thereto. The object of my invention is to provide a mechanism for operating generators or the like from the wheel of the car, the mechanism being so constructed that the speed of the generator may be controlled and regulated, which cannot well be done when the generator is connected directly with the car wheel or axle. As shown in Figs. 3 and 4, the fan A is inclosed within a case A^7 and is operated from the wheel or axle of the car, by means of the pulley A^2, in the manner shown in Fig. 1 or in any other desirable manner. The motor B is inclosed within the case B^5 and is connected with the dynamo-electric machine B′, so as to operate the same. The cases A^7 and B^5 are normally in communication with each other, so that the air set in motion by the fan will enter the case B^5 and operate the motor. A plate or damper C is supported in proximity to the passage-way connecting the case A^7 with the case B^5 and is provided with mechanism by which it is automatically forced into said passage-way, so as to decrease the size of such passage-way, and thereby regulate the speed of the motor B. As shown in Figs. 3, 4, and 5, a plate C′ is located within the passage-way connecting the motor-case with the fan-case, said plate being normally held in an inclined position.

An arm C^2 is connected with said plate, and is connected, by means of the link C^3, with a lever C^4, pivoted at C^5 to an arm connected with some stationary part. A spring C^6 normally holds said arm in such a position that the plate C′ is inclined and projects within the passage-way, as shown. As the speed of the fan increases the velocity of the air forced into the motor-case increases, and said air, striking against the plate C′ tends to move it downwardly. This movement of the plate causes the lever C^4 to move, and hence the damper C is moved into said passage-way, thereby decreasing the size of the passage-way, so as to shut off some of the air, and thereby prevent the speed of the motor from increasing in the same ratio as the speed of fan. If the damper V is forced too far into said passage-way, the force exerted by the air upon the plate C′ will be decreased and the spring C^6 will move it back, and thereby withdraw the damper C from the passage-way. In Figs. 6 and 7 I have shown a similar arrangement, the regulating device being attached directly to the motor B. The vanes B^6 of the motor are pivoted to the arms B^4 and are connected near their outer ends to said arm by means of springs B^7. As the force of the air, due to the high velocity of the fan, increases said vanes will be moved away from the arms B^4, and hence will pass the passage-way B^8 at a greater inclination, thereby presenting less surface to the air and causing a regulation of the speed of the motor.

As shown in Figs. 8 and 9, a damper D is connected with a rod D′ and is interposed between the fan A and the motor B. Connected with the rod D′ are the arms D^2 and D^3, carrying the dampers D^4 D^5, which are adapted to be inserted in the passage-way B^8. These dampers are held away from said passage-way and the damper D is held normally parallel with said passage-way by means of springs D^6. The rod D′ is the valve-stem for a rotary valve within the valve-case E, said valve adapted to control the opening in the pipe E′, which is connected with the pilot of the engine or with the air-brake system. An auxiliary wind-motor F is connected with the armature-shaft of the dynamo-electric machine B′ and the pipe E, the whole being so constructed that when the valve in the case E is open the steam or air rushing through the pipe E′ will operate said motor F, and thereby rotate the armature of the dynamo-electric machine. The valve in the case E is so arranged that when the damper D is in its normal position—that is, in the position shown in Fig. 8—said valve will be open. If now the fan is rotated in the direction of the arrow, the air will be forced through the passage B^8 into the case containing the motor B, said motor being operated thereby so as to rotate the armature of the dynamo-electric machine. As the force of the current of the air increases it strikes the lower surface of the damper D and tends to move said damper upwardly. This movement of the damper closes the valve in the pipe E′ and brings the damper D^5 into the passage-way B^8, thereby decreasing the size of said passage-way. It will be seen that as the current of the air increases the size of the passage-way will be correspondingly increased, and hence the speed of the motor B may be regulated, so as not to be varied by the variations above a predetermined point in the speed of the fan. If now the train is stopped, the fan A ceases to rotate and the damper D takes the position shown in Fig. 8. The valve in the pipe E′ will now be opened and the air or steam rushing through said pipe will operate the auxiliary motor F, said auxiliary motor operating the dynamo-electric machine B′. It will be seen that by this construction the dynamo-electric machine will be continuously operated when the train is stopped, and hence I may do away with storage batteries, connecting the translating devices on the cars directly with the generator. When the train again starts up, the damper D is moved and the valve in the pipe E′ closed, the generator being operated by the motor B. If the direction of the motion of the train is reversed, the fan A will be rotated in a direction opposite to that indicated by the arrow, but the direction of rotation of the motor B will not be changed. If the speed of the fan becomes too great, the air passing through the motor B will strike the upper surface of the damper D and cause the damper D^4 to be moved into the passage-way B^8. The pulley A^2 may be connected with the car-axle by a belt or in any other desirable manner.

In Fig. 10 I have shown a construction in which the generator is connected with the car-axle through intermediate mechanism, the connection being controlled so as to regulate the speed of the generator by means of a fan or air-pumping device. In this construction I use two cone-pulleys G and H. The pulley G is connected by a belt or in any other desirable manner with the car-axle, and the pulley H is connected with the generator B′. Interposed between these two pulleys is a friction-wheel G′. This friction-wheel is preferably feathered to the shaft G^2, mounted in bearings G^3, and is adapted to move along said shaft. An arm G^4 is pivotally connected with said friction-wheel and with a bell-crank lever G^5, said bell-crank lever being pivoted to the stationary part G^6. A fan G^7 is connected with the pulley G, so as to be operated thereby, and discharges against a plate G^8, connected with one end of the bell-crank lever G^5. A spring G^9 normally holds said plate in proximity to the discharge-opening of the fan. If the speed of the pulley G increases above a predetermined amount, the air discharged by the fan G^7 striking against the plate G^8 moves the bell-crank lever, and hence moves the friction-pulley G′ along the shaft G^2. It will be seen that the speed of the generator will depend upon the position of the

friction-wheels E', and the parts are so constructed that as the cone-pulley G increases above a predetermined speed the friction-wheel is moved so as to prevent the speed of the generator from proportionally increasing. If the speed of the pulley G now increases, the force of air against the plate G^8 will also decrease and the spring G^9 will move the friction-wheel to a position corresponding with such speed. It will therefore be seen that the generator may be driven at a substantially constant speed, although the speed of the car may vary.

I have described these several parts in detail; but it is evident that they may be greatly varied in form, construction, and arrangement and that some may be omitted and others used with parts not herein shown without departing from the spirit of my invention, and I therefore do not wish to be limited to the construction herein shown and described.

The use and operation of my invention will be readily seen from the foregoing.

I have herein shown methods and means for regulating and controlling the speed of a generator to be used upon moving cars and the like, such generator operated by the car-axle. In the operation of dynamo-electric machines, as is well known, the speed, to get the best results, should not vary greatly while the machine is in operation. When such machines are connected to the axle of the car, it has heretofore been difficult to obtain this result or to approximate the result so as to obtain satisfactory effects.

I claim—

1. In a device for developing electricity in connection with moving trains, the combination of an electric generator with means for driving the same from the axle or wheel of the car, and a fan responsive to the speed of rotation of the driving part and adapted to regulate the speed of the generator.

2. In a device for developing electricity in connection with moving trains, the combination of the driving part of the car with a generator, intermediate driving mechanism, and an air-driven controller responsive to the speed of the driving part and adapted to regulate the speed of the driven part.

3. In a device for developing electricity in connection with moving trains or other bodies, the combination of a rotating part of the car, with a fan driven thereby, a generator driven by said fan, and a connection from the fan to the generator whereby the speed of the latter is varied responsive to the variations in the speed of the former.

4. In a device for generating electricity, the combination of the driving part of the car with a driven electric generator, an intermediate wind-driven device, and a governing device associated with said motor and responsive to said wind-driven device whereby the speed of the motor varies inversely as the speed of the car-driving portion.

5. In a device for generating electricity on moving trains the combination of a car with a fan driven thereby, a generator of electricity driven by the wind discharged from the fan, a wind-controlled regulator intermediate, and adapted to vary the speed of the generator responsive to the variations in the speed of the car.

6. In a device for generating electricity on moving trains, the combination of the driving parts of the car, with a fan driven thereby, a generator on the car, a fan to drive the generator, the two fans related so that the first drives the second, an auxiliary motor adapted to drive the generator when the car is stationary, a connection from said auxiliary motor to a source of power-supply, and a wind-operated controlling device associated therewith.

7. In a device for generating electricity on moving trains, the combination of the driving parts of the car with a fan driven thereby, a generator on the car, a fan or motor to drive the generator, the two fans related so that the first drives the second, an auxiliary motor connected with said generator and adapted to drive the same when the car is stationary, said auxiliary motor connected with a source of power-supply, a wind-operated controlling device interposed between said auxiliary motor and the source of power-supply, and associated with one of said fans so as to be operated when the fan is in motion and disconnect the auxiliary motor from the source of power-supply, and to connect the auxiliary motor with the source of power-supply after the speed of the fan falls below a predetermined rate.

8. In a device for generating electricity on moving trains, the combination of the driving parts of the car with a fan driven thereby, a generator on the car, a fan to drive the generator, the two fans related so that the first drives the second.

9. In a device for generating electricity on moving trains, the combination of the driving parts of the car with a fan driven thereby, a generator on the car, a fan to drive the generator, the two fans related so that the first drives the second, and wind-controlled devices which vary the speed of the motor inversely as the speed of the car-driving portion.

10. In a device for developing electricity in connection with moving trains, the combination of an electric generator with means for driving the same from a moving part of the car, a fan responsive to the speed of rotation of the driving part and adapted to regulate the speed of the generator, and a direction-varying device interposed between the driving part on the car and the generator.

JAMES W. GUILLOTT.

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