

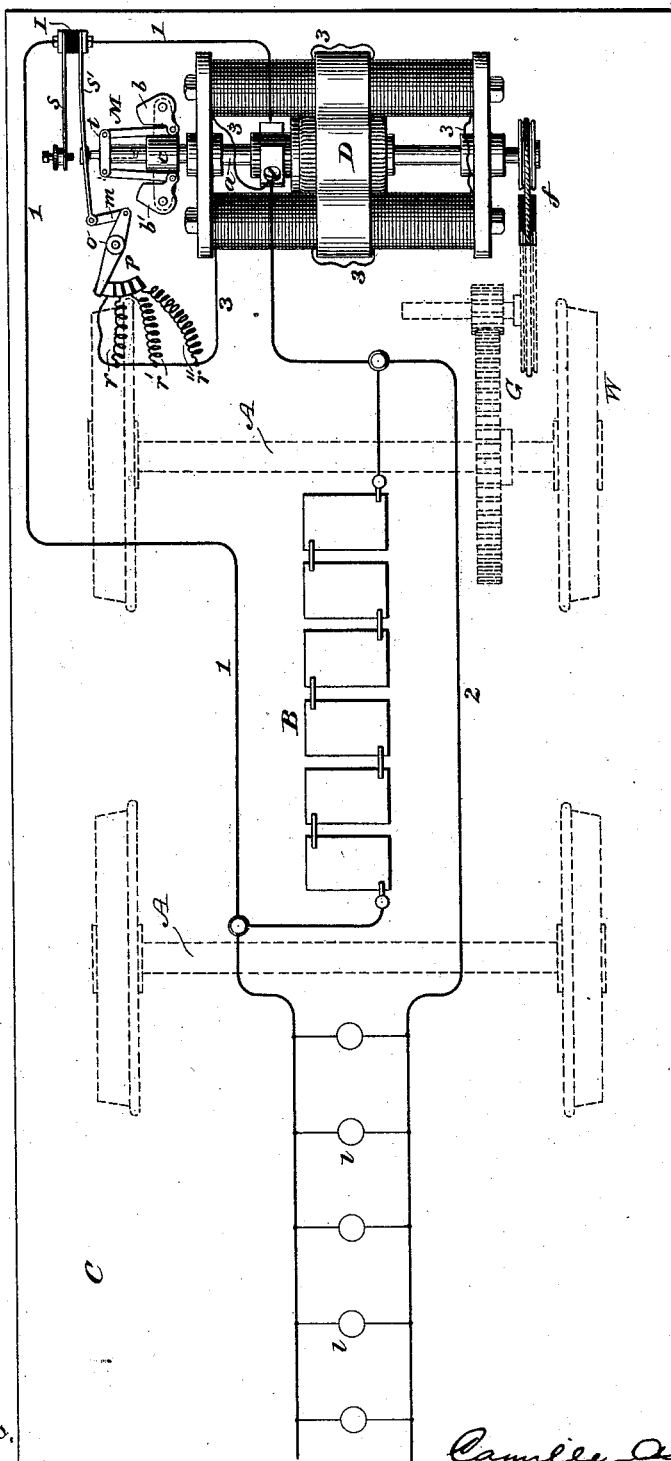
(No Model.)

C. A. FAURE.

AUTOMATIC SWITCH FOR SECONDARY BATTERIES.

No. 382,599.

Patented May 8, 1888.



Witnesses,
Geo. W. Bruck
Edward Thorpe

Inventor,
Camille A. Faure
By his Attorney *Wm. B. Vansie*

UNITED STATES PATENT OFFICE.

CAMILLE A. FAURE, OF NEW YORK, N. Y., ASSIGNOR TO THE ELECTRICAL ACCUMULATOR COMPANY, OF NEW YORK.

AUTOMATIC SWITCH FOR SECONDARY BATTERIES.

SPECIFICATION forming part of Letters Patent No. 382,599, dated May 8, 1888.

Application filed November 16, 1887. Serial No. 255,309. (No model.) Patented in France November 9, 1881, No. 145,931.

To all whom it may concern.

Be it known that I, CAMILLE A. FAURE, a citizen of the Republic of France, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Automatic Switches, of which the following is a specification, and for which I have obtained a Certificate of Addition to my French patent, No. 145,931, dated November 9, 1881, said certificate bearing date January 18, 1882.

My invention is an improvement in automatic regulators, and is especially useful in that system of lighting which embraces a dynamo driven from a wheel or axle of a moving car, a secondary battery supplied with electricity from the dynamo, and a series of electric lamps fed from either or both.

My object is to furnish a means for making and breaking the main circuit when the speed of the dynamo varies above or below a predetermined limit, and for regulating the electromotive force of the dynamo, so as to preserve its current substantially uniform.

I provide a mechanical device operated by the centrifugal force due to the speed of rotation of the armature, which acts to make the main circuit when the speed of rotation is sufficient to produce the requisite minimum electromotive force and to break said circuit whenever the speed falls below this point. The said device also operates a switch-arm to introduce and withdraw resistance with respect to a separate circuit containing the field-magnet coils of the dynamo, so that the dynamo-current is rendered substantially uniform. This centrifugal regulator I place upon the armature-shaft in such a position that the divergence due to variations in centrifugal force is in a vertical plane; thus the evil effect due to the jolting of the car is compensated for. In case of the illustration any given jolt or shock will produce a deflection of one of a pair of governor-balls in a direction to produce a given effect; but the same jolt or shock will produce an equal and opposite effect upon the other ball, and the evil effect is thus neutralized. I also provide two blade-springs upon which the terminals of the divided main circuit are re-

spectively carried. These springs preserve the continuity of the circuit by moving together or in contact within a considerable range, the result being that jolts, jars, and shocks to which the apparatus is subjected on a railway are ineffectual to produce a rupture of the circuit.

I will now describe my invention by reference to the accompanying drawing.

C is the floor of a car located upon trucks having wheels W and axles A.

G and f are gear-wheels and belt mechanically connecting the pulley upon the armature-shaft *a* of the dynamo D with the axle A, operating to drive the dynamo.

B is a secondary battery having its terminals electrically connected with the brushes of the dynamo. Main conductors 1 and 2 connect the lamps *l* with the dynamo and battery.

3 is a derived circuit containing the field-coils of the dynamo and a switch, *p*, operating to connect or disconnect a series of resistance-coils, *r r'*, &c., with respect to said circuit. This switch consists of a series of insulated contacts, an arm making contact therewith pivoted at *o*, and a link, *m*, connecting said arm to a blade-spring, *s'*, fixed to a block of insulating material, I, to which spring one terminal of the divided lead 1 is connected. Spring *s* is also connected to block I and forms the other terminal of the divided conductor 1.

c is a collar fixed to armature-shaft *a*.

M is a mechanical device operated by centrifugal force. There is a T-shaped piece on the end of shaft *a* capable of a movement equivalent to lengthening shaft *a*. Weights or balls *b b'* are pivoted, as shown, in such a manner that under the influence of centrifugal force they act in a vertical plane to produce a movement of the T-piece *t*. These weights *b* are so placed that the jolts and jars incident to railroad travel occur at right angles to the shaft upon which they are placed. While the weights are in the position shown, the jolting due to the unevenness of the road-bed would not affect either. When they are in a position between that shown and ninety degrees of rotation, a jolt or jar would affect them equally and oppositely, and the evil ef-

fects of chattering or intermittent break in connection at the circuit-breaking points is avoided.

The apparatus operates as follows: The armature is driven by the rotation of the car-axes. When a sufficient speed is attained, the device M moves spring *s'* into contact with spring *s* and closes the main circuit. When this occurs, the switch-arm *n* is on the first insulated contact, as shown, there is no artificial resistance in the field-magnet circuit, and the dynamo is generating an electro-motive force effective to charge battery B and raise lamps *ll* to incandescence. As speed of rotation increases the device M forces spring *s s'* farther along, moving the switch arm *p* onto the second insulated contact, *r*, and introducing the smallest artificial resistance into the circuit 3. This reduces the field magnetism and the electro-motive force generated by the dynamo to the normal point. If the speed still increases, the springs *s* and *s'* are still farther moved along, as is the switch-arm *n*, and a larger resistance, *r'*, is introduced into the field-circuit 3. If the speed decreases, the reverse of the described operation takes place and the electro-motive force is still preserved substantially uniform until the speed of rotation drops below the point where the minimum effective electro-motive force of charge is produced, when the springs *s* and *s'* separate and disconnect the dynamo and battery.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of a car or vehicle, a dynamo-electric machine, a secondary battery in circuit therewith, a switch or circuit-closer in the main circuit, and a mechanical device, arranged as described, controlled by centrifugal force and operating in a vertical plane to close said switch when the speed of rotation reaches a predetermined point, whereby the effect of jars and jolts upon the switch is avoided.

2. The combination of a dynamo-electric machine having its field-coils in a separate circuit, a switch or circuit-changer in said circuit, a switch or circuit-changer in the main circuit, and a device operated by the centrifugal force due to the speed of rotation controlling both said switches.

3. The combination of a dynamo-electric machine having its field-coils in a separate circuit, a switch or circuit-changer in said circuit, a switch or circuit-changer in the main circuit, and a mechanical device for automatically controlling both switches.

Signed at New York, in the county of New York and State of New York, this 15th day of November, A. D. 1887.

CAMILLE A. FAURE.

Witnesses:

FREDERICK EDER,
WM. B. VANSIZE.