(No Model.) 2 Sheets—Sheet 1.

A. GROSSMAN.

CONTROLLER FOR MOTORS AND BRAKES OF ELECTRIC CARS.

No. 594,946. Patented Dec. 7, 1897.

Fig. 1.

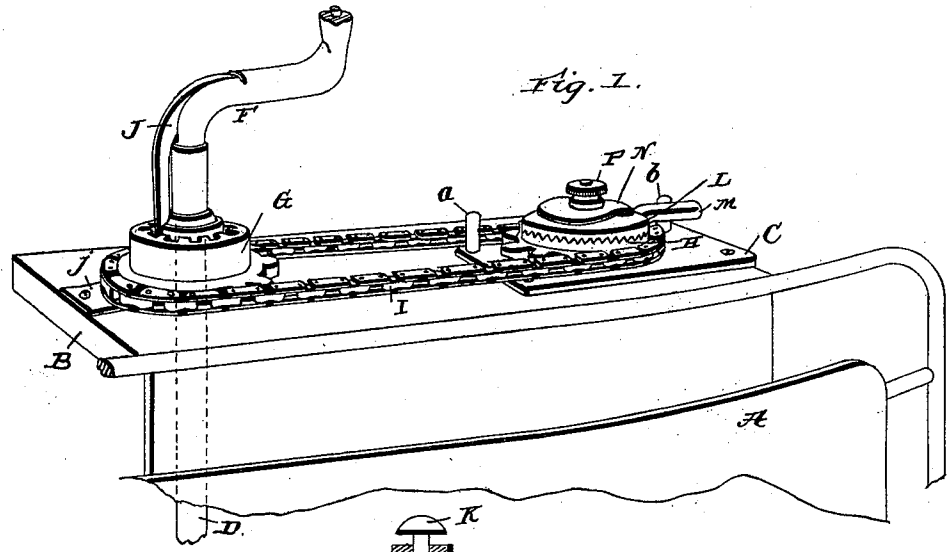
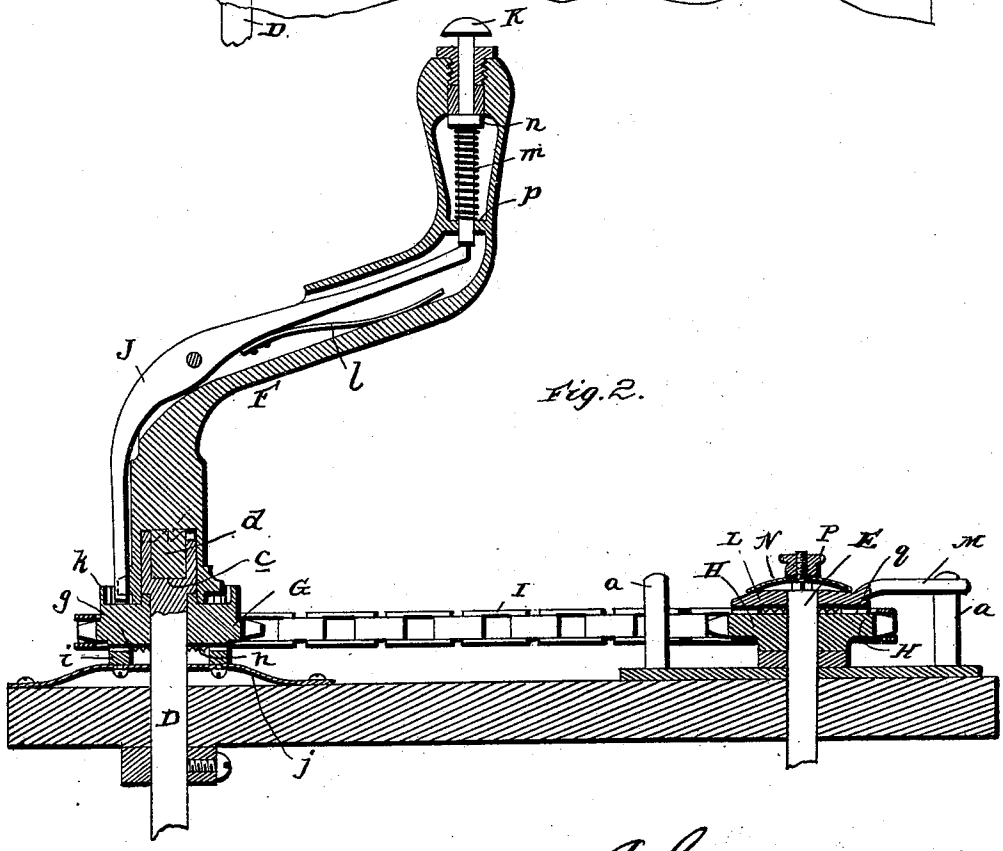


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

A. GROSSMAN.

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Fig. 4.

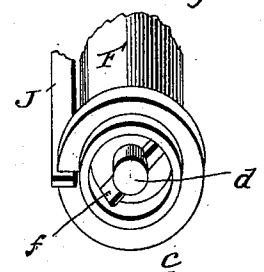


Fig. 3.

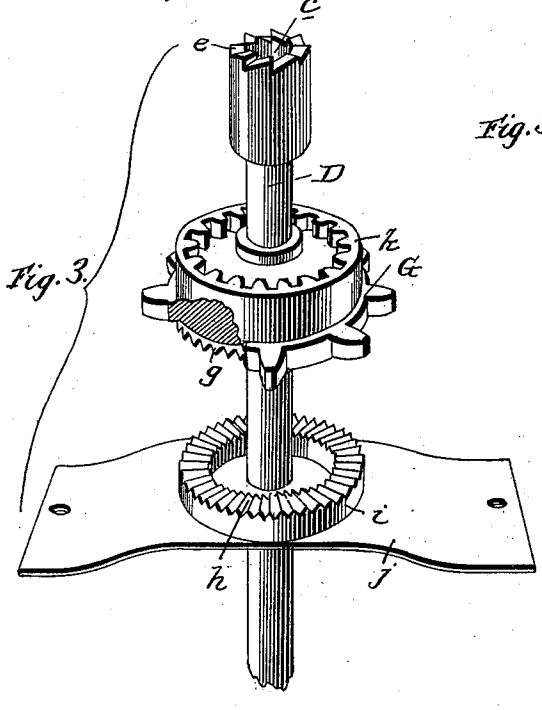
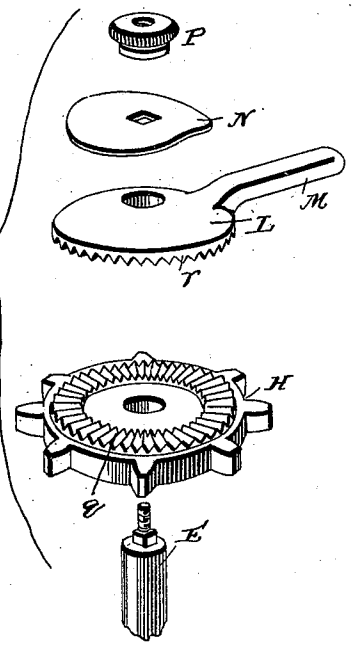


Fig. 5.



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UNITED STATES PATENT OFFICE.

ADOLPHE GROSSMAN, OF NEW ORLEANS, LOUISIANA.

CONTROLLER FOR MOTORS AND BRAKES OF ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 594,946, dated December 7, 1897.

Application filed August 31, 1897. Serial No. 650,156. (No model.)

To all whom it may concern:

Be it known that I, ADOLPHE GROSSMAN, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Mechanism for Controlling Motors and Brakes of Electric Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to mechanism for controlling the motors and brakes of electric cars and will be fully understood from the following description and claims when taken in conjunction with the annexed drawings, in which—

Figure 1 is a perspective view of my improved mechanism as applied to an electric car. Fig. 2 is an enlarged longitudinal section through the same. Fig. 3 is a perspective view, partly in section, illustrative of the brake-staff and its appurtenances, the latter being shown as separated. Fig. 4 is an inverted perspective view of the lower end of the brake-crank, and Fig. 5 comprises perspective views of the upper portion of the shaft of the electric switch or rheostat and the parts employed thereon.

In the said drawings similar letters designate corresponding parts in all of the several views, referring to which—

A designates the dash of an electric car, to which a suitable shelf or support B is connected.

C designates a plate on the support B, which is provided with stops *a b* and may also be provided with a suitable index. (Not illustrated.)

D designates a brake-staff which extends through the shelf or support and is designed to be connected with the brake or brakes of the car by a chain or other suitable means, (not illustrated,) and E designates the shaft of the rheostat or switch of an electromotor, the said rheostat and motor not being illustrated because they form no part of my invention.

The brake-staff D is provided in its upper end with a socket *c*, which is designed to receive the interior journal *d* of a crank F, and said staff is also provided at its upper end with beveled teeth *e*, designed for engagement of the interior teeth *f* of the crank, (see Fig. 4,) whereby it will be seen that when the crank is turned to the right the staff will turn with it, while when said crank is turned toward the left the staff will remain idle, thus enabling the motorman to manipulate the crank in the usual manner when applying the brake.

My invention contemplates utilizing the rotation of the brake-staff to apply and release the brakes and also to stop and start the electromotor. To this end the brake-staff and rheostat-shaft E are equipped with sprocket-wheels G H, and a sprocket-chain I is employed to transmit motion from the wheel G to the wheel H. The sprocket-wheel G is provided at its under side with a clutch-face *g*, which engages a corresponding face *h* on a clutch member *i*, fixed to and mounted on a spring-plate *j*, whereby it will be seen that when idle said wheel G will be held against casual rotation, for a purpose presently described. The wheel G is also provided on its upper side with an interiorly-toothed annular flange *k*. This flange *k* is designed for the engagement of a detent-lever J, which is fulcrumed on the crank F (see Fig. 2) and is normally held out of engagement with the flange *k* by a spring *l*.

To enable the motorman to readily place the lever J in engagement with the flange *k* and thereby lock the sprocket-wheel G to the crank, the plunger or push-pin K is provided. This plunger or pusher-pin K is normally held in the position shown in Fig. 2 by a spring *m* interposed between its enlargement *n* and the diaphragm *p* in the handle, and it is designed when depressed to place the lever J in engagement with the flange *k* and when released to return to its normal position, so as to enable the spring *l* to disengage the detent-lever from said flange. The sprocket-wheel H of the rheostat-shaft E is also loose on said shaft, for a purpose which will presently be described. This sprocket-wheel H has a clutch-face *q* on its upper side, designed to engage a corresponding clutch-face *r* on the under side of a plate L, which is fixed on the shaft E, so as to turn therewith and yet have

a slight vertical movement thereon. The said plate L, which has an arm M, is normally held in engagement with the sprocket-wheel H by a spring-plate N, which is mounted on and preferably keyed to the shaft E and is interposed between a nut P on the shaft and the plate L, as shown.

In the practice of the invention the rheostat on the shaft E is so arranged that when the arm M of the plate L rests against the stop *b* the full electric current is supplied to the motor, while when said arm M rests against the stop *a* the current is cut off. Said rheostat is also so arranged that the resistance to the current will be gradually increased as the arm M moves in one direction and will be gradually diminished as said arm moves in the opposite direction, thus insuring the gradual stopping and starting of the motor.

In the operation of the mechanism, when the car is running at full speed and it is desired to stop the same, the motorman presses on the plunger K, so as to lock the sprocket-wheel G to the crank F, and turns said crank toward the right. This, as will be observed, rotates not only the brake-staff, but moves the plate L and shaft E, so as to stop the motor. When the arm M of the plate L reaches the stop *a* and the current is cut off from the motor, the motorman releases the plunger K, so as to release the sprocket-wheel G from the crank, and continues the rotation of the said crank toward the right until the car comes to a full stop or its speed is reduced to the extent desired.

When it is desired to start the car, the brake-staff is turned toward the left until the brakes are released. The plunger K is then depressed, so as to force the detent into engagement with the toothed flange *k* of the sprocket-wheel G, and the movement of the crank toward the left is continued until the arm M of plate L rests against the stop *b*. From this it will be seen that the motorman is enabled by turning the crank F in one direction to release the brakes and start the motor and by turning said crank in the opposite direction to stop the motor and apply the brakes, which is an important advantage.

When the sprocket-wheel G is released from the crank F, it will be seen that the clutch member *i* will hold said wheel G against casual rotation and will thus prevent it from moving the sprocket-wheel H and plate B and thereby casually start or stop the motor.

It will also be seen that in the event of the motorman forgetting to release the plunger K when the arm M of plate L reaches either one of the stops *a b* the continued rotation of the crank F to the right or left, according to whether the car is being stopped or started, will do no damage, because the clutch-teeth of the wheel H will ride over those of the plate L when the arm of said plate reaches the stop to which it is moved.

I prefer to use sprocket-wheels and a chain for transmitting motion from the brake-staff to the rheostat-shaft, because such gearing is well adapted for the purpose. I do not desire, however, to be understood as confining myself to the same, as any gearing or connection suitable to the purpose of my invention may be employed. I also prefer to use the construction shown and described whereby the sprocket-wheel G is clutched to the support and the sprocket-wheel H is clutched to the shaft E. I do not desire, however, to be understood as confining myself to such construction, as any construction which will serve the purpose described may be employed.

Various changes in the construction and relative arrangement of the several parts of my improved mechanism may also be made in practice without departing from the scope of my invention.

Having thus described my invention, what I claim is—

1. A mechanism for controlling the motor and brake of an electric car, comprising a rotary brake-staff, a handle so connected with the staff that it will turn in one direction with said staff and in the opposite direction loose on the same, a gear-wheel loosely mounted on the staff, a suitable means for holding said gear-wheel against casual rotation, suitable means for detachably connecting said gear-wheel with the handle, and a rheostat or switch shaft connected by gearing with said gear-wheel, substantially as specified.

2. A mechanism for controlling the motor and brake of an electric car, comprising a suitable support, a rotary brake-staff, a crank for turning said staff, a gear-wheel loosely mounted on the staff and clutched to the support, means for fixing said gear-wheel to the crank, and a rotary rheostat or switch shaft connected by gearing with the gear-wheel on the brake-staff, substantially as specified.

3. A mechanism for controlling the motor and brake of an electric car, comprising a support, a rotary brake-staff, a stop on the support, a rotary rheostat or switch shaft provided with means for engaging said stop, and a gear-wheel loosely mounted on and clutched to the rheostat or switch shaft and connected by gearing with the brake-staff, substantially as specified.

4. A mechanism for controlling the motor and brake of an electric car, comprising a support, a rotary brake-staff, a rotary rheostat or switch shaft, stops arranged on the support at opposite points with respect to the rheostat-shaft, a gear-wheel loosely mounted on the rheostat or switch shaft and connected by gearing with the brake-staff, a plate mounted on the rheostat-shaft so as to turn therewith and adapted to engage the stops on the support, and coacting clutches on said plate and the gear-wheel, substantially as specified.

5. A mechanism for controlling the motor and brake of an electric car, comprising a suit-

able support, a rotary brake-staff, a crank for turning said staff, a gear-wheel loosely mounted on the staff and clutched to the support, means for fixing said gear-wheel to the crank, a stop arranged on the support, a rotary rheostat or switch shaft provided with means for engaging said stop, and a gear-wheel loosely mounted on and clutched to the rheostat or switch shaft and connected with the brake-staff, substantially as specified.

6. A mechanism for controlling the motor and brake of an electric car, comprising a suitable support, a rotary brake-staff, a crank for turning said staff, a sprocket-wheel loosely mounted on the staff, an adjustable device for detachably fixing said sprocket-wheel to the crank, coacting clutch-faces on the support and sprocket-wheel, a rotary rheostat or switch shaft, stops on the support at opposite points with respect to said shaft, a sprocket-wheel loosely mounted on the shaft, a plate mounted on said shaft so as to turn therewith and adapted to engage the stops on the support, coacting clutch-faces on said plate and sprocket-wheels, and an endless chain connecting the sprocket-wheels of the brake-staff and rheostat-shaft, substantially as specified.

7. A mechanism for controlling the motor and brake of an electric car, comprising a rotary brake-staff, a rotary rheostat or switch shaft, a wheel loose on the brake-staff and connected by gearing with the rheostat-shaft, a handle for turning the brake-staff and means for detachably fixing said handle to the loose wheel, substantially as specified.

8. A mechanism for controlling the motor and brake of an electric car, comprising a rotary brake-staff, a rotary rheostat or switch shaft, a wheel loose on the brake-staff and connected by gearing with the rheostat-shaft, a crank for turning the brake-staff, and a detent on said crank for engaging the loose wheel and fixing it to the crank; said detent being normally held out of engagement with the wheel, substantially as specified.

9. A mechanism for controlling the motor and brake of an electric car, comprising a rotary brake-staff, a rotary rheostat or switch shaft, a sprocket-wheel on said rheostat-shaft, a sprocket-wheel loose on the brake-staff, a handle for turning the brake-staff, means for detachably fixing said handle to the sprocket-wheel, and an endless sprocket-chain connecting the sprocket-wheels of the brake-staff and rheostat-shaft, substantially as specified.

10. A mechanism for controlling the motor and brake of an electric car, comprising a rotary brake-staff, a rotary rheostat or switch shaft, a wheel loose on the brake-staff and connected by gearing with the rheostat-shaft and having an interiorly-toothed annular flange on its upper side, a crank for turning the brake-staff, a spring-pressed detent-lever fulcrumed on the crank and normally held out of engagement with the toothed flange of the gear-wheel, and a plunger arranged in the crank and adapted when depressed to hold the detent-lever in engagement with the toothed flange of the gear-wheel, substantially as specified.

11. A mechanism for controlling the motor and brake of an electric car, comprising a brake-staff, a stop, a rheostat or switch shaft provided with means for engaging the stop, whereby said stop is enabled to arrest its rotation, and a gear-wheel so connected with the rheostat-shaft that it will turn with said shaft until the rotation thereof is stopped and will then turn thereon; said gear-wheel being also connected by gearing with the brake-staff, substantially as specified.

12. A mechanism for controlling the motor and brake of an electric car, comprising a support, a rotary brake-staff, a rotary rheostat or switch shaft, a stop arranged on the support, a plate mounted on the shaft so as to turn therewith and having an arm to engage the stop and also having a clutch-face, a gear-wheel loosely mounted on the shaft and having a clutch-face engaging that of the plate, a spring for pressing said plate and gear-wheel together, and a connection between said gear-wheel and brake-staff, substantially as specified.

13. A mechanism for controlling the motor and brake of an electric car, comprising a support, a rotary brake-staff, a rotary rheostat or switch shaft, a gear-wheel loosely mounted on the brake-staff and having a clutch-face, a clutch member fixed on a spring connected to the support and having a clutch-face engaging that of the gear-wheel, and a connection between said gear-wheel and the rheostat-shaft, substantially as specified.

14. A mechanism for controlling the motor and brake of an electric car, comprising a support, a rotary brake-staff, a rotary rheostat or switch shaft, a stop on the support, a plate mounted on the shaft so as to turn therewith and having an arm to engage the stop and also having a clutch-face, a sprocket-wheel loosely mounted on the shaft and having a clutch-face engaging that of the plate, a spring for pressing said plate and sprocket-wheel together, a sprocket-wheel loosely mounted on the brake-staff and having a clutch-face, a clutch member fixed on a spring connected to the support and having a clutch-face engaging that of the sprocket-wheel, a sprocket-chain connecting the sprocket-wheels of the staff and shaft, a crank for turning the brake-staff and means for detachably fixing the sprocket-wheel of the staff to said crank, substantially as specified.

15. A mechanism for controlling the motor and brake of an electric car, comprising a stop, a rheostat or switch staff provided with means for engaging the stop whereby said stop is enabled to arrest its rotation, a gear-wheel so connected with the rheostat-shaft that it will turn with said shaft until the ro-

tation thereof is stopped and is then free to turn thereon, a brake-staff, a gear-wheel loosely mounted on said staff and connected with the gear-wheel on the rheostat-shaft, a handle so connected with the brake-staff that it is adapted to turn in one direction with the staff and in the opposite direction on the same, and a suitable means for detachably connecting the handle with the gear-wheel on the brake-staff, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ADOLPHE GROSSMAN.

Witnesses:

JOS. LAUTENSCHLAEGER,

JOHN M. MEARS.