No. 628,967. Patented July 18, 1899.

H. VAN HOEVENBERGH.

ELECTRICALLY DRIVEN VEHICLE.

(Application filed June 2, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

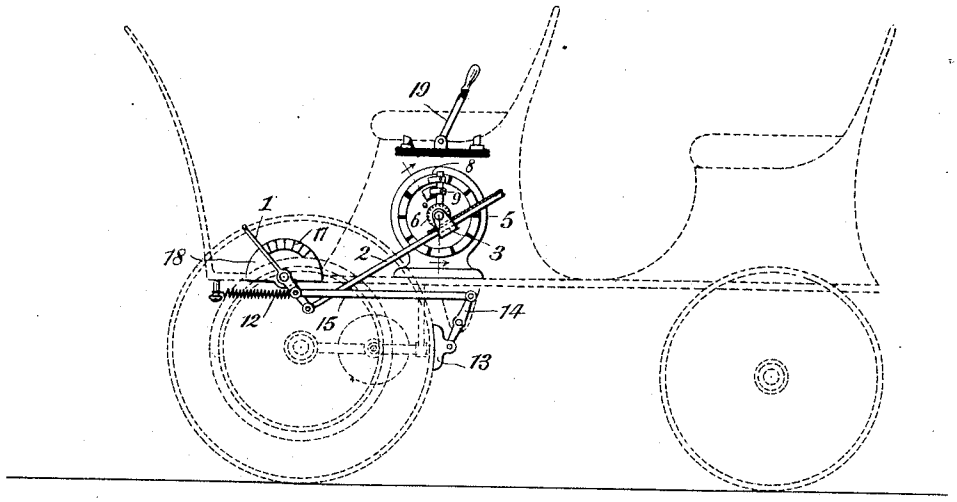


Fig. 2.

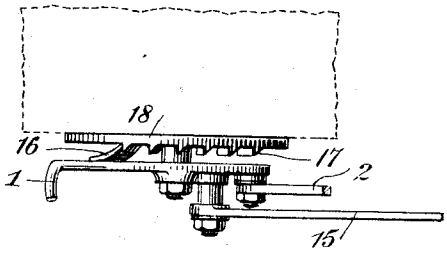
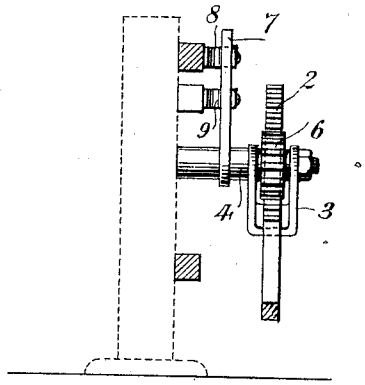


Fig. 3.



WITNESSES:
C. E. Ashley
H. W. Lloyd

INVENTOR:
Henry Van Hoevenbergh
By his Attorney
Rossiter Read

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 628,967. Patented July 18, 1899.

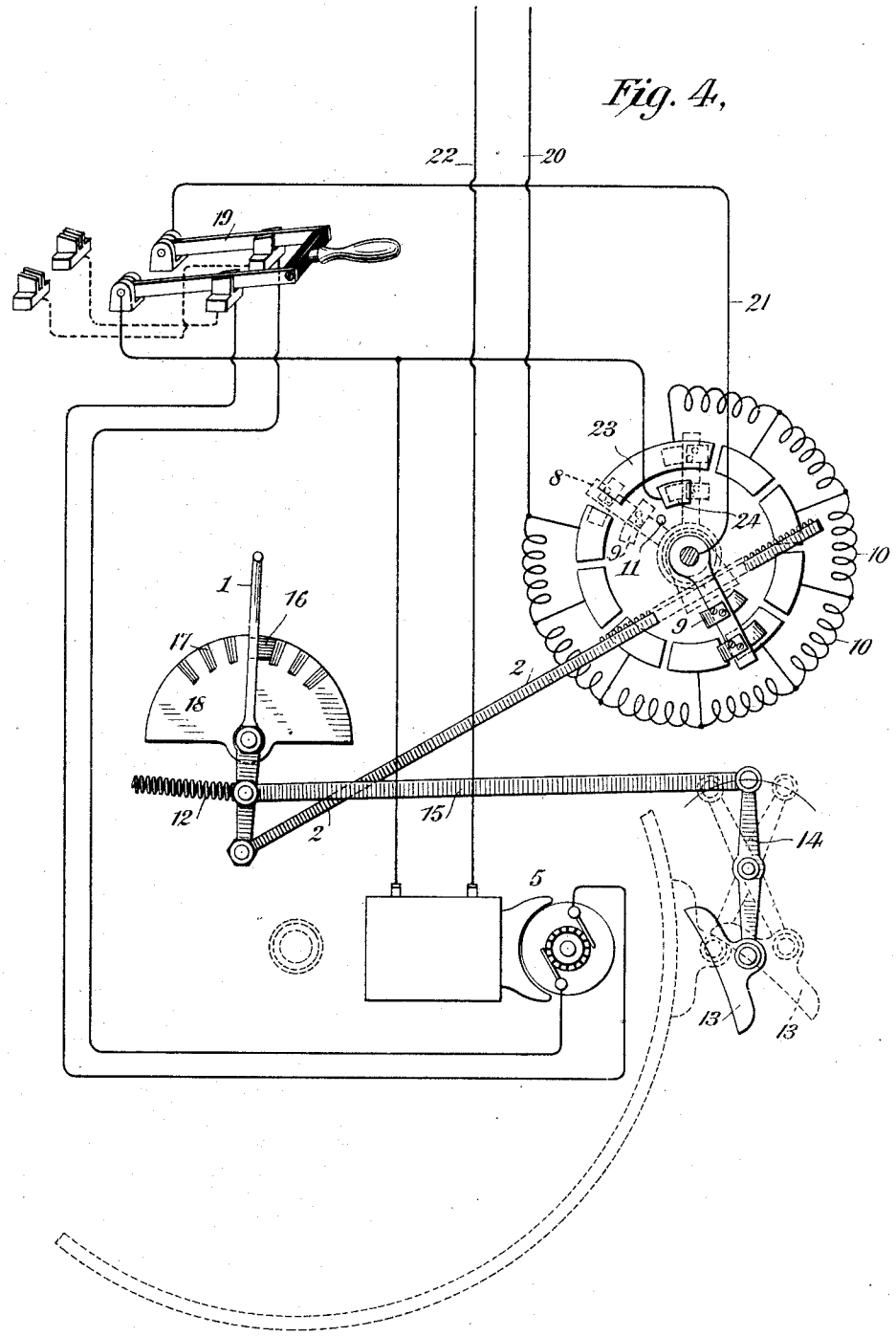
H. VAN HOEVENBERGH.

ELECTRICALLY DRIVEN VEHICLE.

(Application filed June 2, 1897.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4,



WITNESSES:
C. E. Ashley
H. W. Lloyd

INVENTOR:
Henry Van Hoevenbergh
By his Attorney
Robt. N. Lott.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF NEW YORK, N. Y., ASSIGNOR TO NOAH C. ROGERS, OF GREENWICH, CONNECTICUT.

ELECTRICALLY-DRIVEN VEHICLE.

SPECIFICATION forming part of Letters Patent No. 628,967, dated July 18, 1899.

Application filed June 2, 1897. Serial No. 639,092. (No model.)

To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, residing in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Electrically-Driven Vehicles, of which the following is a specification.

My invention has for its object the control of electrically-propelled vehicles. In carrying out this object I provide the vehicle with an electric motor and connections by which the speed of the motor may be cut down simultaneously with the application of a brake by a foot-lever controlled by the driver or motorman, the speed being first reduced by introducing resistance, the armature then short-circuited, while the field-magnet remains excited, and a friction-brake then put on. The apparatus is so organized that the motor must necessarily be thrown out of operation as a motor and utilized to produce an electromagnetic brake before the friction-brake can be called into action.

The several features of novelty will be more particularly hereinafter described and will be definitely indicated in the claim appended to this specification.

In the accompanying drawings, illustrating the invention, Figure 1 is a side elevation of my controlling apparatus, the outlines of a vehicle containing the same being shown in dot. Figs. 2 and 3 are views of detents of the controlling device; and Fig. 4 is a diagram of the electric circuits, showing their relation to the regulating devices.

The apparatus is shown as adapted to a motor-wagon, to which my controller is particularly adapted. It might, however, be employed on other types of vehicles or conveyances. The control of the braking apparatus, both electrical and mechanical, is exclusively by foot-power—a mode of control with which those accustomed to driving vehicles drawn by horses are most familiar and which therefore is the most natural to use in an emergency.

1 represents a foot-lever pivoted on the vehicle-frame and located on the side where the driver is most accustomed to sit—commonly the right side. It is pivotally connected with a rack-bar 2, supported by and sliding in a yoke 3, pivotally suspended from a sleeve 4 (see Fig. 3) on the armature-shaft of the propelling electric motor 5. Secured to the sleeve 4 on the outside is a gear-wheel 6, coöperating with the rack, and on the inside a brush-arm 7, carrying two trailers or brushes 8 9, the former adapted to engage a series of contact-blocks, between which are interposed resistance-coils 10. (See Fig. 4.) The contact-blocks are arranged in circular order, and the parts are so arranged that the brush 8 may be made to sweep the entire circle and the arm finally brought against a stop 2 when the friction-brake is set. The foot-lever is controlled by a spring 12, which normally holds it in a position in which the resistance is cut out, the armature short-circuited, and the friction-brake set. The brake-shoe 13 is mounted on a lever 14, journaled in a standard secured to the vehicle-frame, said lever being connected by a rigid link 15 with the foot-lever. The foot-lever carries a spring-dog 16, (see Fig. 2,) adapted to engage any one of a series of detents 17, mounted on a circular frame 18, to arrest it at any desired position to graduate the strength of current as desired to suit the speed or grade. A reversing-switch 19 permits the armature-circuit of the motor to be reversed and therefore the direction of movement of the vehicle.

The operation of the organization will best be understood from the diagram Fig. 4. In the position shown the motor is in action at partial speed, part of the resistance 10 having been cut out. The field-magnet and armature are shown as series connected, but may be in shunt relation, as preferred. Current passes from the supply-circuit—a trolley-wire or other source—through a circuit-closer (not shown) by way of conductor 20 through such part of the resistance 10 as may be included by the position of the brush 8, through the latter to a brush bearing on a collar at the hub, thence by conductor 21 to the reversing-switch, thence to the armature and back to the other pole of the switch, and thence to the field-magnet coil and back to the return supply-wire by conductor 22. In stopping the vehicle the driver pushes with his foot on lever 1, thus gradually cutting in re-

sistance to the motor-circuit and slowing the motor down until the brush 8 is brought to the final contact-block 23, when the brush 9 engages contact-block 24. Thus it will be seen that the movement of the foot-lever through a short arc shifts the brushes of the rheostat over almost a complete circle by reason of the multiplying-gear afforded by the rack and pinion which operate the rheostat. The motor then acts as a short-circuited generator having an independently-charged field-magnet, and a powerful magnetic brake is brought into action to check the speed of the armature and slow down the vehicle, the field-magnet being excited by current flowing over conductor 20 through the resistance-coils of the rheostat to the contact-segment 23 thereof, thence by the brush-lever to contact 24 through the field-magnet and out by conductor 22, and the armature-current flowing from one pole of the switch over conductor 21 to the brush-lever, across the latter to contact 24, and back to the other pole of the switch. On further pressure of the foot-lever the friction-brake is set and the vehicle is brought to rest, where it is held until the foot-lever is released. In case it is desired to back the vehicle the reversing-switch is operated and the foot-lever is partially released. It will thus be seen that the entire control of the motive power as to speed or rest is by the driver's foot, permitting the driver to use both hands to operate the steering-gear. The latter may be of any approved kind. It has been deemed unnecessary to show it, as it forms no part of the invention. This organization permits the vehicle to be controlled by the simple and natural method used on horse-drawn vehicles and the one which is exclusively resorted to in sudden emergencies, and, moreover, requires a minimum amount of exertion upon the part of the driver, as it leaves his hands free to manipulate the steering-gear.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

An electrically-propelled vehicle provided with a foot-lever, a rack connected therewith, a brush geared to the rack, a rheostat the contacts of which are engaged by the brush, connections for short-circuiting the motor after the rheostat has been completely cut in, and a friction-brake set by the lever after the motor has been short-circuited.

In testimony whereof I have hereunto subscribed my name this 24th day of May, A. D. 1897.

HENRY VAN HOEVENBERGH.

Witnesses:

ALICK G. MACANDREW,

ROBT. H. READ.