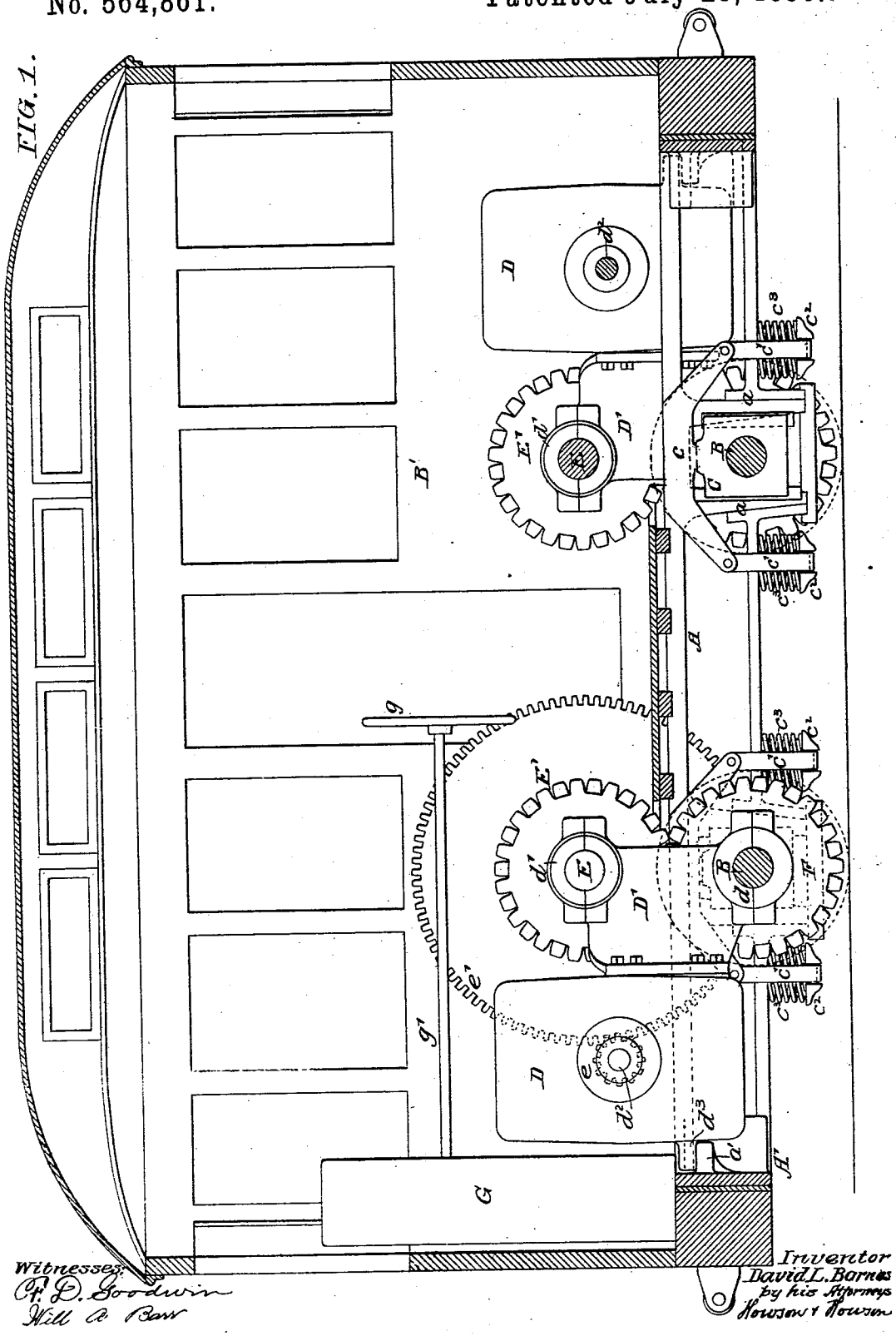
(No Model.) 3 Sheets—Sheet 1.

D. L. BARNES.

ELECTRIC RACK LOCOMOTIVE.

No. 564,861. Patented July 28, 1896.

FIG. 1.



Witnesses:
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Will A. Barr

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David L. Barnes
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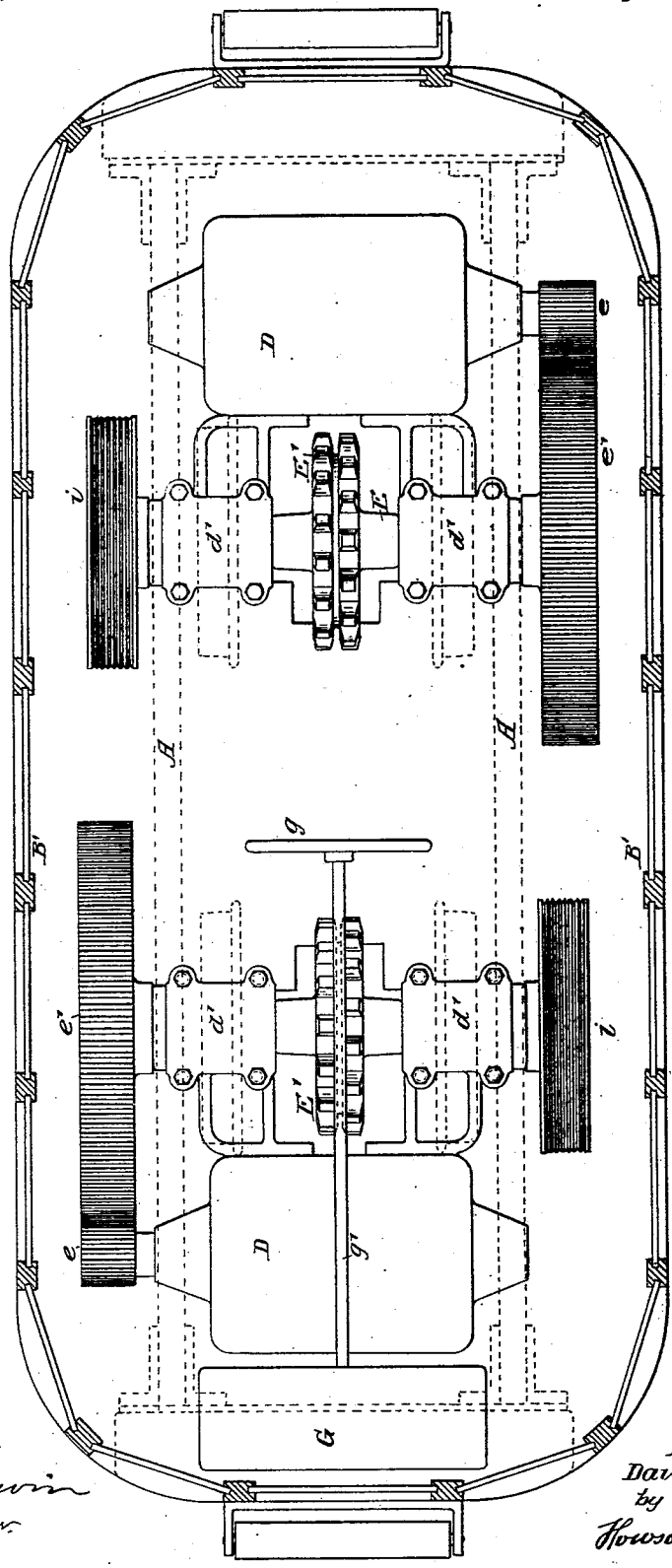

FIG. 2.

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(No Model.) 3 Sheets—Sheet 3.

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FIG. 4.

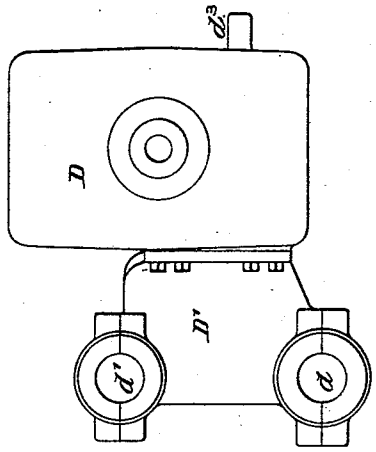
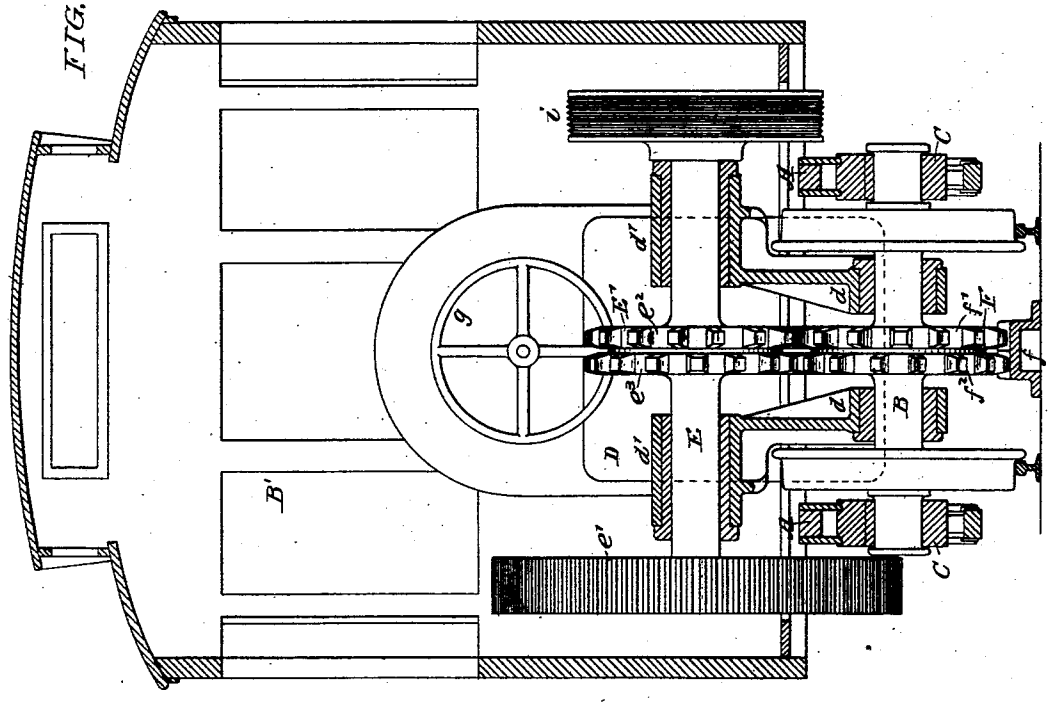


FIG. 3.



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UNITED STATES PATENT OFFICE.

DAVID L. BARNES, OF CHICAGO, ILLINOIS.

ELECTRIC RACK-LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 564,861, dated July 28, 1896.

Application filed March 19, 1896. Serial No. 583,937. (No model.)

To all whom it may concern:

Be it known that I, DAVID L. BARNES, a citizen of the United States, and a resident of Chicago, Illinois, have invented certain Improvements in Electric Rack-Locomotives, of which the following is a specification.

The object of my invention is to construct an electric rack-locomotive in which the motors are supported partly by the axles and partly by the frame.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved rack-locomotive. Fig. 2 is a sectional plan view. Fig. 3 is a transverse sectional view. Fig. 4 is a detached side view of the motor and its bearings.

A A are the side frames of a locomotive, on which is the body or car-frame B′ of any suitable design. On the frames A are the pedestals *a a* for the journal-boxes C.

B are axles adapted to the journal-boxes C, as clearly shown in Figs. 1 and 3. Yokes *c* are supported by each box C, and suspended from the end of these yokes by the links *c′* are carriers c^2 for the springs c^3, which support the frames A, Fig. 1.

D are electric motors of any suitable construction, and on each motor are frames D′, having boxes *d* and *d′*. The boxes *d* are adapted to the axles B, while an intermediate shaft E is adapted to the boxes *d′*.

On the motor-shaft d^2 is a pinion *e*, meshing with the gear-wheel *e′* on the intermediate shaft E, and on this intermediate shaft E is a gear-wheel E′, which meshes with the gear-wheel F on the axle B. The gear-wheel F is adapted to mesh with a rack *f*, Fig. 3, mounted between the rails of the track.

It will be noticed that the wheels E′ and F are double wheels. One half, e^2, of the wheel E′ has teeth which are opposite the spaces in the other half, e^3, of the wheel. The same construction is carried out on the wheel F. The teeth of the half *f′* are opposite the spaces of the half f^2. This form of gear-wheel is common in rack-locomotives.

I have shown in the drawings two bearing-frames D′ for each motor, but a single frame may be used without departing from my invention.

On that side of each motor D opposite to the side carrying the bearing-frame is a lug d^3, which rests upon a bracket *a′* on the cross-bar A′ of the frame A. Thus the motor is partly supported by the frame and partly by the axle B. The motor rests loosely upon the bracket *a′*, so that it will accommodate itself to the axle.

In the drawings, Figs. 1 and 2, I have shown the locomotive having two independent motors, each motor geared to an axle, one motor being a duplicate of the other, so that each axle is driven by its own motor.

In some instances a single motor may be used, either on a single driving-shaft, or the driving-wheels may be coupled in the ordinary manner by connecting-rods.

One or both of the intermediate shafts E may be provided with friction-drums *i* or other brake mechanism.

More than two motors may be used and more than two axles, and the axles may be coupled together when the motors are independently arranged without departing from my invention, the essential feature of my invention being the arrangement of the parts so that the rack-gear can be driven by an electric motor.

The controller-box G is made in any suitable manner. The controller-wheel *g* is mounted on the shaft *g′*, which is coupled to the mechanism in the box, this shaft being supported in any appropriate manner and arranged within easy access of the operator.

I claim as my invention—

1. The combination in a rack-locomotive, of the rack-wheel and its axle, a motor having a frame supported by said axle and also having a bearing on the frame of the locomotive and gearing between the armature-shaft of the motor and the axle, one of the elements of said gearing being the rack-shaft, substantially as described.

2. The combination in a rack-locomotive, of the main frame, the driving-axle, a gear-wheel mounted on the axle and adapted to engage a rack, a motor, a bearing-frame secured to or forming part of the motor and having journal-boxes adapted to the axle, an intermediate shaft and a motor-shaft, the said intermediate shaft being supported by the said frame and having gear-wheels, one meshing with the gear-wheel on the axle and the

other meshing with the pinion on the motor-shaft, the motor resting loosely on the frame, substantially as described.

3. The combination in an electric rack-locomotive, of the main frame, the driving-axle, journal-boxes mounted in the pedestals of the frame, springs interposed between the frame and the axle, a motor having a lug loosely resting on the frame, bearing-frame secured to or forming part of the motor and resting upon the axle, an intermediate shaft journaled in bearings on the said frame, a gear-wheel on the axle adapted to mesh with a rack, a gear-wheel on the intermediate shaft meshing with the rack gear-wheel, a second gear-wheel also on the intermediate shaft, the motor-shaft and a pinion on said motor-shaft engaging with the said second gear-wheel, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID L. BARNES.

Witnesses:
JAMES G. KEYS,
HENRY HOWSON.