

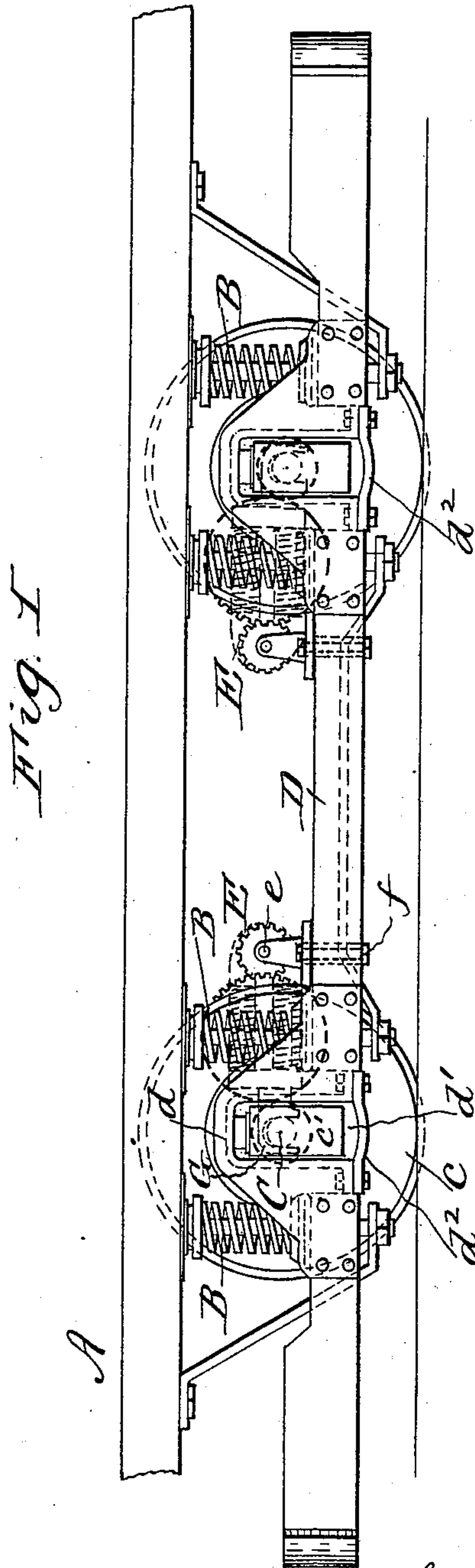
(No Model.)

2 Sheets—Sheet 1.

J. A. BRILL.
ELECTRIC RAILWAY CAR.

No. 426,708.

Patented Apr. 29, 1890.



WITNESSES:

H. B. Hoyatt.
R. C. Amies

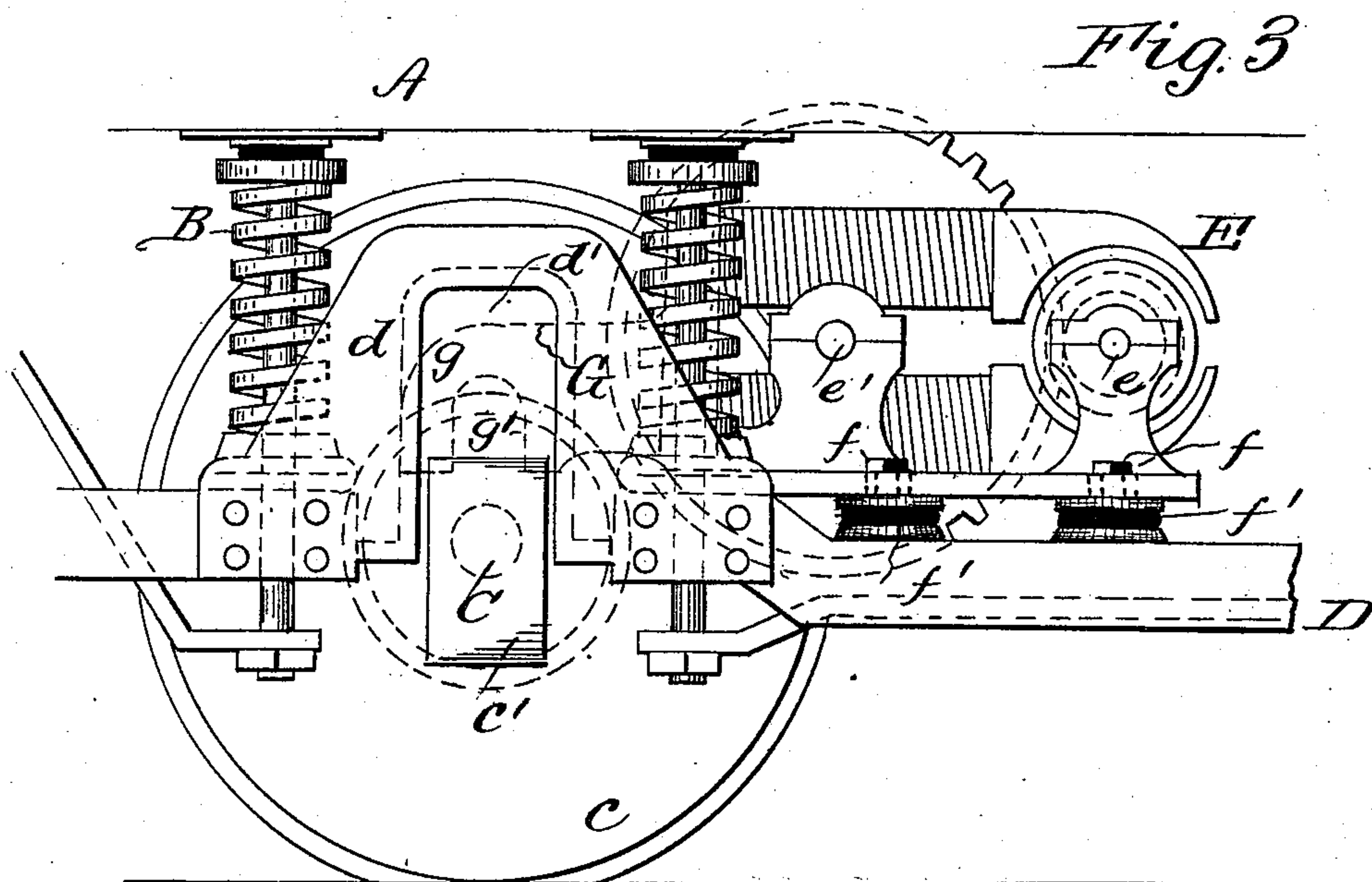
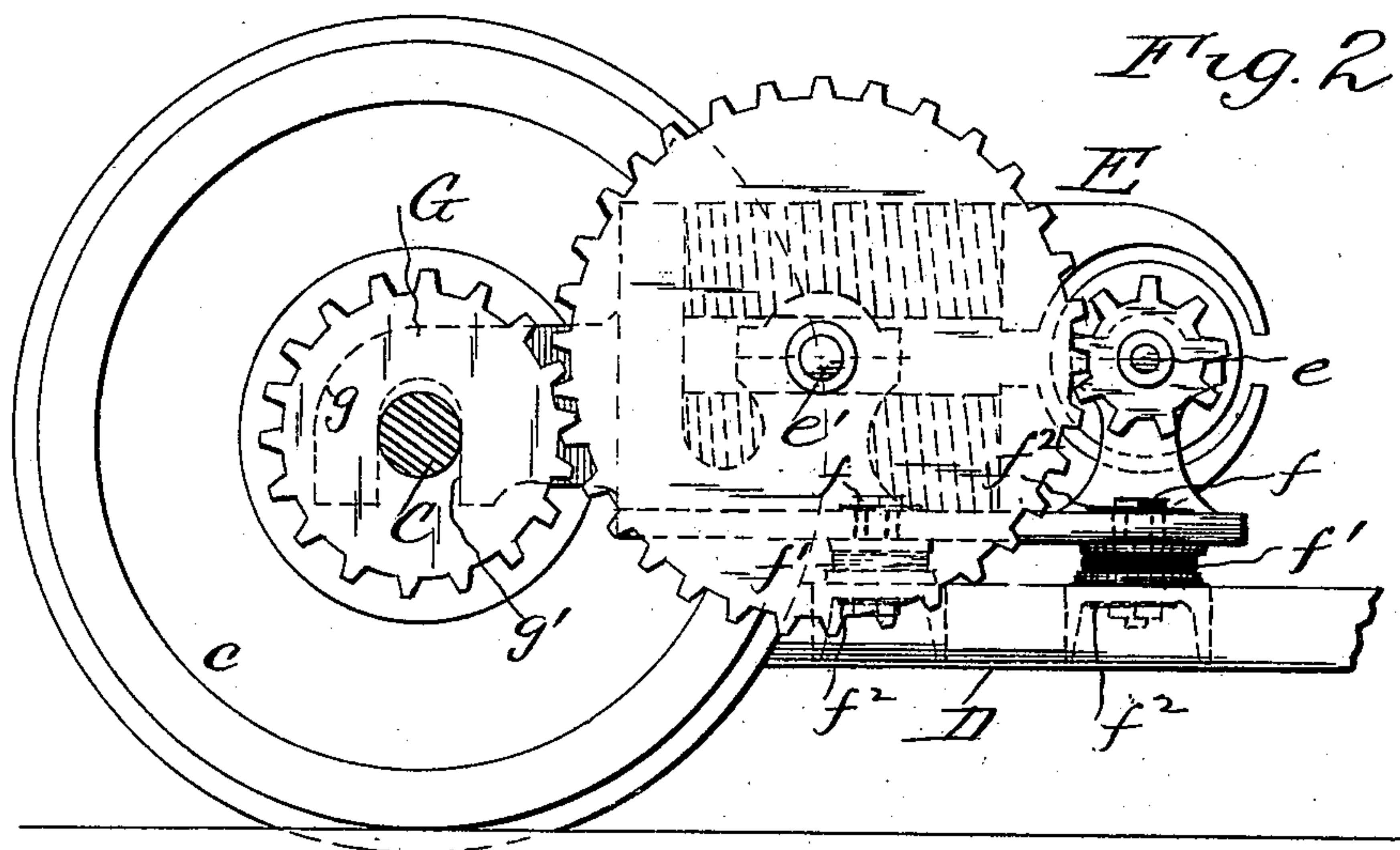
INVENTOR,

John A. Brill
By S. J. Van Stavern
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UNITED STATES PATENT OFFICE.

JOHN A. BRILL, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC-RAILWAY CAR.

SPECIFICATION forming part of Letters Patent No. 426,708, dated April 29, 1890.

Application filed May 18, 1889. Serial No. 311,294. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. BRILL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Railway Cars, of which the following is a specification.

My invention has relation to electrically-propelled cars of the type having an electric motor in gear directly with one of the car-axles either by gearing between the axle and the motor armature-shaft or between the axle and a counter-shaft, which in turn is in gear with the armature-shaft.

Heretofore, so far as I am aware, the system of supporting said motor which is deemed the most advisable for use is to suspend or mount the motor partly on the car-axle and partly on the car-body or truck-frame—that is to say, one end of the motor has journal-bearings on the axle and the other end is secured by a spring, flexible, or other connection to the car-body or truck-frame or a fixture thereon, preferably one which is not subject to the action of the car-springs.

The advantage of such described system of hanging or mounting the motor is that the axle and the motor armature-shaft or the counter-shaft between them when used are maintained in due parallel alignment under all conditions of service, and the car-axles are independent of each other to admit of each conforming to the curves or irregularities in the line of way, whereby the durability and efficiency of the motor and its actuated parts are enhanced. In practice it has been found, however, that the mounting of one end of the motor-frame on the axle is objectionable for the reasons, first, that the weight of the motor on the axle causes undue wear of it and the motor boxes or bearings on the axle, and, second, that said motor boxes or bearings have to be unshipped and the motor temporarily secured to the truck-frame or car-body when it is necessary to remove the axle with its wheels and axle-boxes for the purpose of replacing or repairing the same.

My invention has for its object to avoid such described objections and yet maintain

or secure the above-described advantages; or, in other words, it has for its object to so mount or support the motor that its armature and counter shafts are in direct gear with the axle, the latter is maintained in parallel alignment with the motor-shafts, and the axle with its wheels and axle-boxes are easily and readily removed from the car without necessitating unshipping or dismantling any part of the motor-frame, and the weight of the latter on the axle and wear of said frame and axle as heretofore is avoided.

My invention accordingly consists of the combinations, constructions, and arrangements of parts as hereinafter described in the specification and pointed out in the claims, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation of part of a car with running-gear and frame suspended from the axle boxes and motors on said frame, and having engagement with the axles in accordance with my invention. Fig. 2 is a sectional elevation of part of the same, drawn to an enlarged scale, showing more plainly the manner of securing the motor in position and its engagement with the axle; and Fig. 3 is an elevation of the same, showing the manner of unshipping an axle without dismantling any part of the motor-frame.

A represents a part of the frame-work of a car or truck; B, the springs therefor; C, the axles, having wheels *c* and axle-boxes *c'*; and D, the frame supported or mounted upon the axle-boxes *c'*, all of which may be constructed and arranged for operation in any of the well-known ways or as desired.

In the drawings, the frame D is shown having as a component part the axle-box pedestals *d*, which are of inverted-U-shaped form, to provide lower open ends for the recesses *d'*, closed by removable bars *d²*, so that the axles, with their wheels and boxes, can be removed from the car for replacement or repairs, as fully shown, described, and claimed in another pending application filed by me on the 17th day of May, 1889, Serial No. 311,294.

E represents the electric motor of any suitable construction. In the drawings I have shown its armature-shaft *e* in gear with a

counter-shaft e' , which in turn is in gear with the axle, said counter-shaft e' having its bearings preferably in the frame of the motor E to maintain the counter and armature shafts in parallel alignment. The motor E is wholly mounted upon the frame D, being suitably bolted to cross rods or bars, as necessary, said bolts being illustrated at f . To give the motor a spring-support or to cushion it, I interpose rubber or other elastic cushions f' and f'' between the frame D and motor E and between said parts and the bolt heads and nuts, respectively. The openings in the motor-frame or those in the frame D, through which the bolts f pass, are preferably slightly larger than the diameter of the bolts, in order to admit of the motor having a longitudinal movement independent of frame D, as and for a purpose hereinafter set forth.

From the motor E project arms G, having bifurcated or yoke outer ends g , to provide vertical recesses g' therein with lower open ends, into which the axle C passes for engagement with said arms G, so that the latter will maintain said axle in due parallel alignment with the motor-shafts. The arms G do not impose any weight on the axle, hence there is no wear of said parts; and when the removable bars d^2 are detached from the pedestals d to remove the axle, the latter automatically releases itself from the guide-arms G, and no part of the motor-frame is disturbed or dismantled as such described removal is effected.

As the motors E on frame D have a slight longitudinal movement independent of said frame, the motor for each axle conforms to the lateral movements of the axle in passing around curves or at other points of the line, or, in other words, each motor and axle are independent of each other, which would not be the case if both motors were rigidly secured to frame D; but where only one motor E is employed for a car, said motor may be firmly bolted to frame D.

From the foregoing it will be noted that the motor is in direct gear with the car-axle, and the latter is maintained in parallel alignment with the motor-shafts without the motor being journaled to or imposing any of its weight on the axle, and that the latter may be removed from the car without dismantling any part of the motor.

It is obvious that my improvements are applicable to other forms of motors and to all styles of cars and frames D or other like fixtures on the car or truck.

What I claim is—

1. In a car, the combination of a motor mounted upon and wholly or entirely supported on a frame not subject to the action of the car-springs, and having guide-arms in engagement with one of the axles of the car to keep said axle in parallel alignment with the motor shaft or shafts, substantially as set forth.

2. In a car, the combination of a car-axle, and an electric motor wholly supported independently of and having a guide-arm engaging with said axle, substantially as set forth.

3. In combination with a car and its axles, an electric motor wholly supported upon the car independently of the axles and of the action of the car-springs, gearing interposed between the motor and an axle, and a guide projecting from the motor and engaging with said axle, substantially as set forth.

4. In combination with a car and its axles, an electric motor having a counter-shaft and wholly supported on the car independently of its axles, gearing interposed between an axle and said counter-shaft, and guide-arms projecting from the motor and having slotted ends engaging with said axles, substantially as set forth.

5. In combination with a car, a frame D, not subject to the action of the car-springs, an electric motor secured to said frame and having a loose guide-arm wholly independent of the motor-supporting mechanism and engaging one of the axles of the car, substantially as set forth.

6. In combination with a car and one of its axles, a frame D, an electric motor secured thereto wholly independent of support from said axle, cushions between said motor and frame, gearing interposed between the motor and an axle, and guide-arms from the motor having a loose engagement with said axle, substantially as set forth.

7. In combination with a car and its axles, a frame D, electric motors on said frame in gear with said axles and having a guide-arm engagement with the axles and each axle and motor being independent of the other, substantially as set forth.

8. In combination with a car and one of its axles, a motor secured to the car so as not to be subject to the vertical action of its springs, having a gear in engagement with said axle, and a guide-arm having a loose engagement with said axle to admit of removing the axle from the car without dismantling any of the parts of the motor, substantially as set forth.

9. In combination with a car and its axle-boxes, a frame on the axle-boxes not subject to the action of the car-springs, electric motors supported independently of the axles and spring-supported on said frame and having a longitudinal movement on their spring-supports, slotted end guide-arms for said motors for loose engagement with the axles and gearing interposed between the motors and axles, substantially as set forth.

10. The combination, in a car, the frame D, having pedestals d and removable bars d^2 , axle C, motor E, secured to frame D, and guide-arms G, engaging with said axle, substantially as set forth.

11. In combination with a car and its axle-boxes, a frame D, having yokes spring-supported upon the axle-boxes, electric motors

spring-supported on frame D and having a guide-arm G for loose engagement with one of the axles of the car, and a gear-connection with said axle, substantially as set forth.

- 5 12. In combination with a car and its axle-box frame, a motor loosely mounted and having a longitudinal movement on said frame, guide-arms G for the motor-frame, having a loose engagement with the car-axle and a gear-

connection between the motor and axle, substantially as set forth.

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

JOHN A. BRILL.

Witnesses:

R. S. REED,

R. W. BROADBENT.