(No Model.) 2 Sheets—Sheet 1.

C. F. WINKLER.

ELECTRIC CAR TRUCK.

No. 514,109. Patented Feb. 6, 1894.

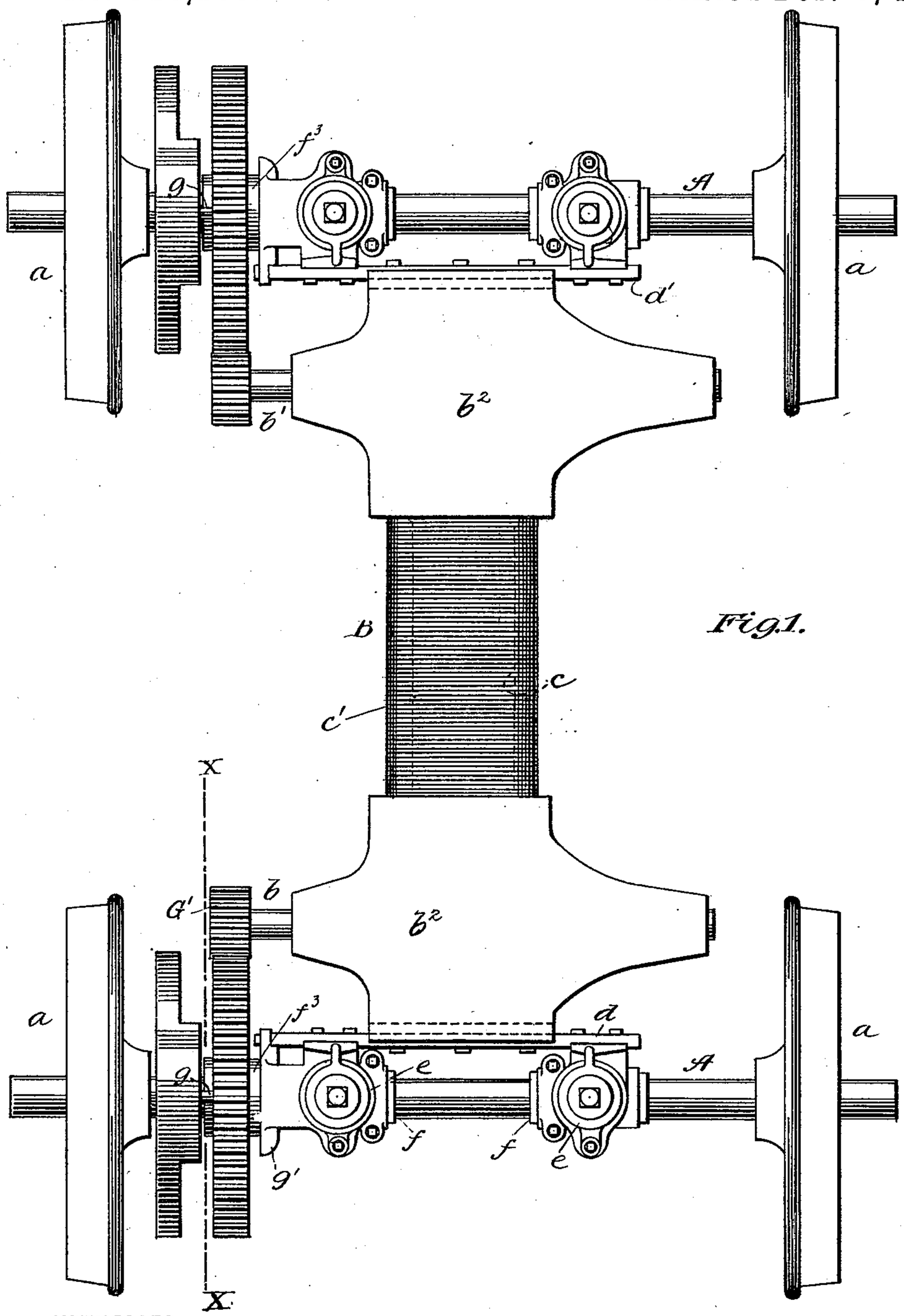

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

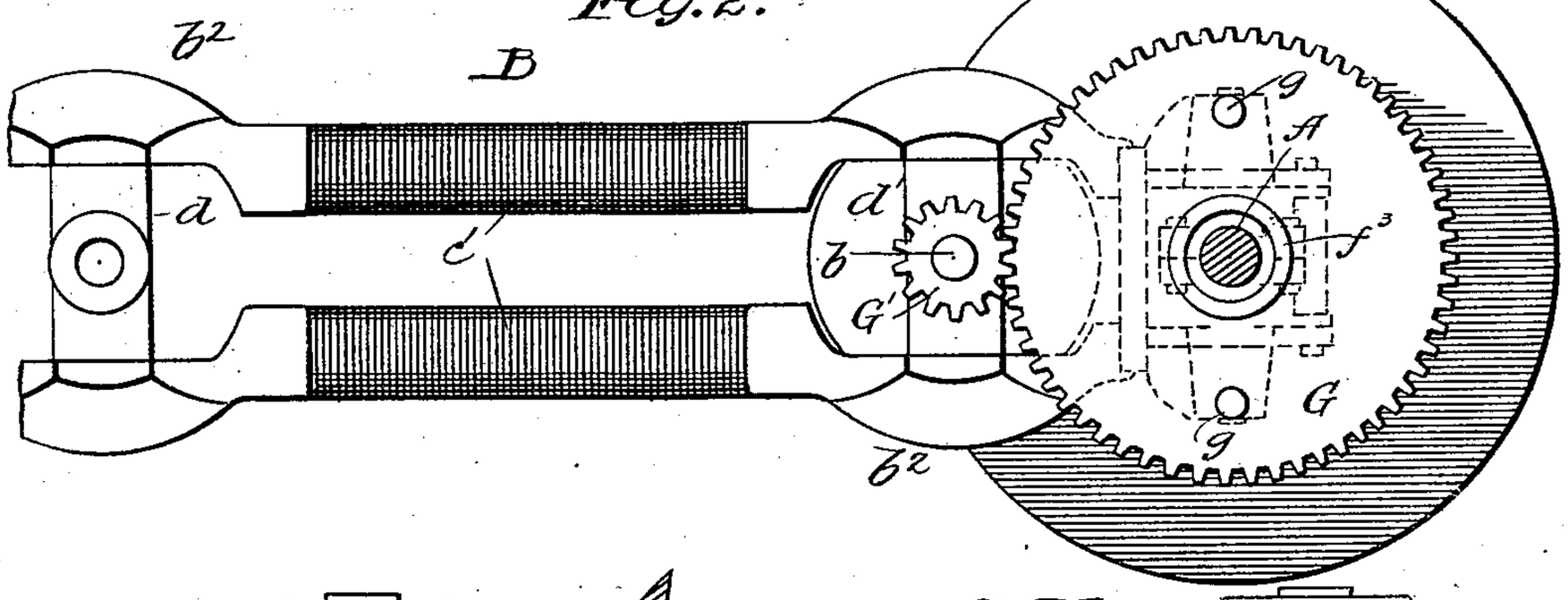


Fig. 3.

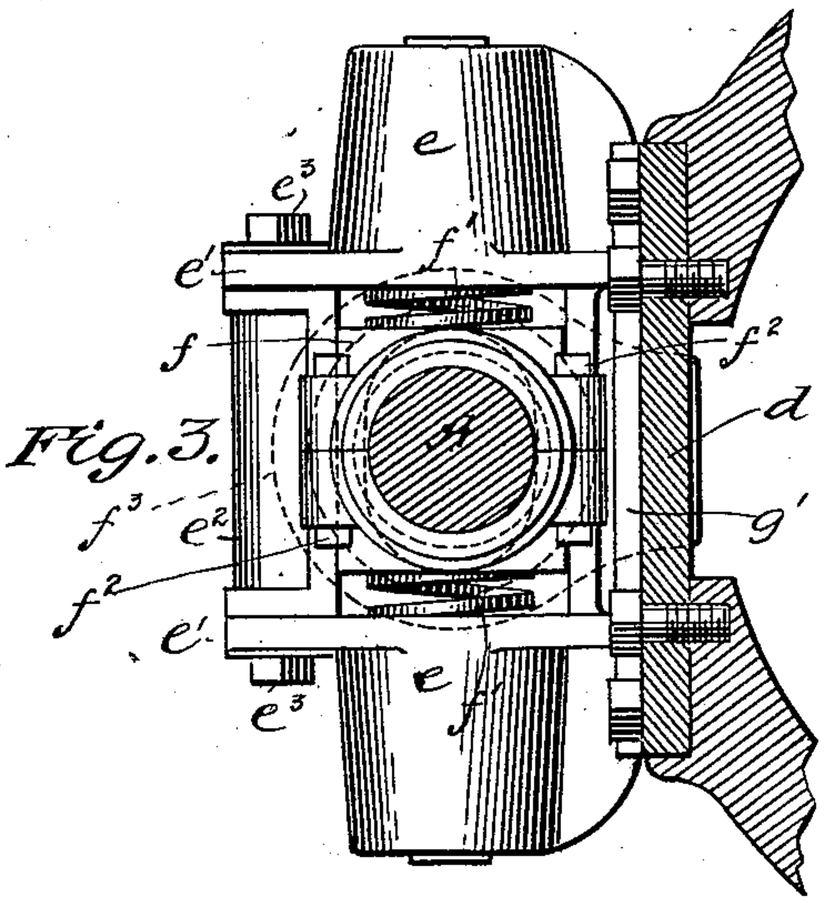


Fig. 4.

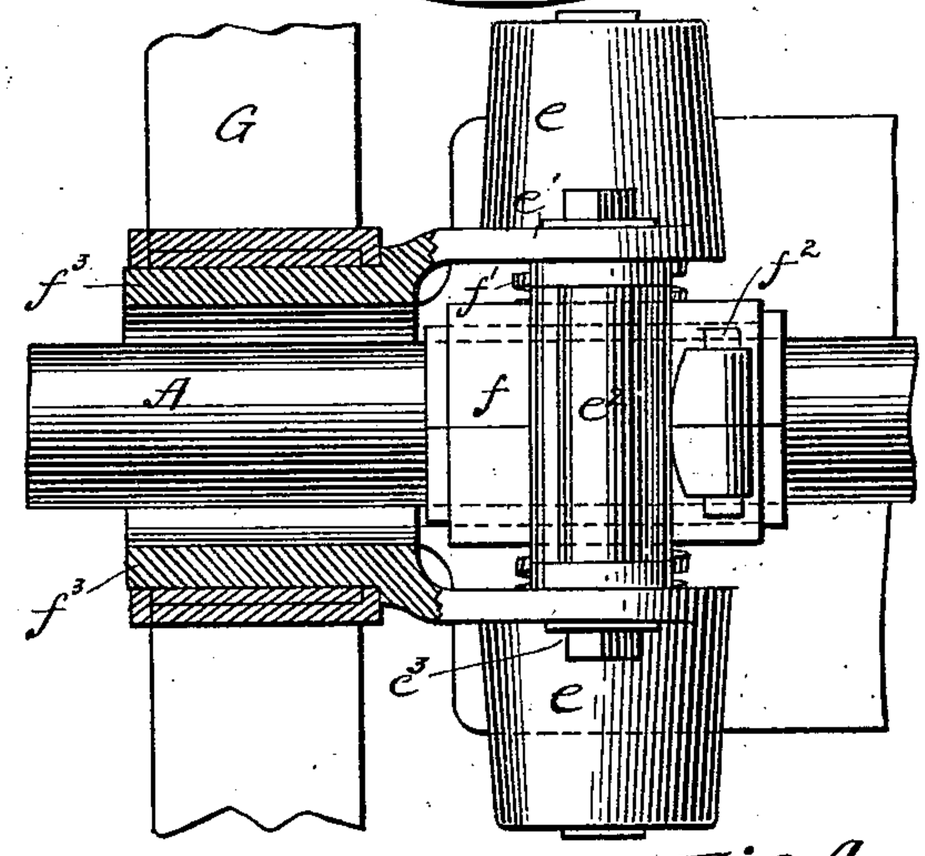
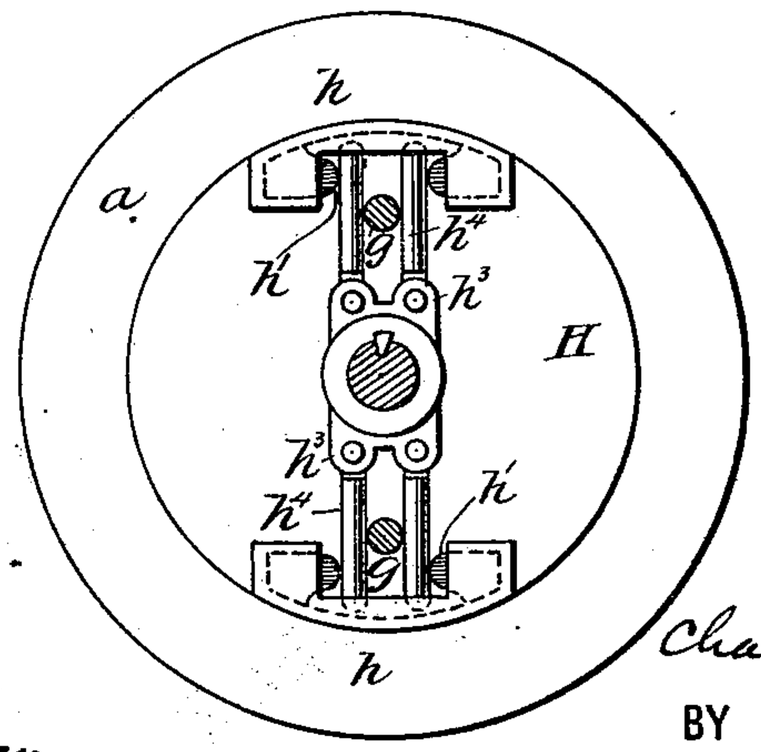


Fig. 5.



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CHARLES F. WINKLER, OF KINGSTON, NEW YORK.

ELECTRIC-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 514,109, dated February 6, 1894.

Application filed May 22, 1893. Serial No. 475,015. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. WINKLER, a citizen of the United States, residing at Kingston, in the county of Ulster and State of New York, have invented certain new and useful Improvements in Electric-Car Trucks, of which the following is a full, clear, and exact description.

My invention relates to electric car trucks and motors, the object being to provide a construction wherein the motor will be protected from the jarring or vertical motions of the car axles due to unevenness in the road-bed or obstructions on the track.

A further object is to provide means whereby a motor having two armatures geared respectively to the two axles of the car, and forming a single magnetic circuit for both armatures, may be saved from strains due to the relative movements of the two axles with which it is connected and upon which it is mounted.

To this end, the invention consists of the combination of the motor of the particular type mentioned, with two car axles upon which the motor is supported, and a peculiar form of flexible connection between the motor and the car axles.

The invention also consists of a peculiar form of gearing between the armature shafts and the car axles.

Referring to the accompanying drawings, Figure 1 represents a plan of the truck and motor. Fig. 2 is a section through one of the axles, taken on line $x\,x$ of Fig. 1, and showing portions of the mechanism in side elevation. Fig. 3 is a transverse section of the axle showing the flexible mounting in detail. Fig. 4 is a view of the mechanism shown in Fig. 3 and taken at right angles thereto, parts being in section; and Fig. 5 is a face view of the clutch disk looking from the line $x\,x$ of Fig. 1.

A A respectively represent the two car axles, and a are the car wheels fixed thereto.

B is a single electric motor having two armatures, the shafts of which are respectively represented by b and b', and two sets of pole pieces b^2 for the respective armatures. The four pole pieces are connected together by a pair of field magnet cores c, one connecting the two upper pole pieces, and the other connecting the two lower pole pieces. These cores are surrounded by coils of wire c', and it will be observed that there is but one magnetic circuit established by these coils which includes both armatures.

The motor is mounted upon the axles in the following manner: The upper and lower halves of the field magnet structure are connected together at their outer ends by two plates of non-magnetic material d, d'. The connection between the motor and the axle at each end is exactly the same so that a description of the apparatus at one end will suffice for both. This non-magnetic plate d is secured to the pole pieces by means of bolts and it extends laterally beyond the pole pieces on each side. To the projecting ends of the plate are secured two castings surrounding the axle. These castings consist of two cups e, e, arranged above and below the axle with their concave sides facing it. The edges of the cups are provided with lateral flanges e' between which are located bolsters or brackets e^2 which connect the cups together and hold them a certain distance apart. These bolsters are secured by bolts e^3 which make a rigid structure. The bolsters form vertical guides in which a two part axle box f is fitted and adapted to move a limited extent vertically. In each cup is placed a coiled spring f' and these springs bear upon the opposite sides of the axle box so that the weight of the motor is acting upon them. With this construction, the axle and the motor have a certain vertical movement independent of each other. The parts of the boxes are secured together by bolts f^2. One pair of these cups has formed integrally with it a sleeve f^3 which extends toward the adjacent car wheel and surrounds the axle. The internal diameter of this sleeve is such that the axle may move freely inside of it to the extent permitted by the springs without coming in contact with its walls. This sleeve serves as an axis for a gear wheel G which is loosely mounted upon it. It is braced and supported by a flange g' which is bolted to the end of the plate d in the manner shown in Fig. 1. The gear wheel engages with a pinion G′ on the adjacent armature shaft. The gear wheel is provided with two pins g, g arranged at diametrically opposite points on its side next to the car wheel.

H represents a disk keyed to the axle and extending close to the gear G. At opposite points on the face of the disk adjoining the wheel are formed two boxes *h* open on the side next to the center of the disk and each containing two rubber cushions *h'*. On the hub of the disk are formed, on opposite sides, two pairs of lugs h^3 in which are respectively pivoted two pairs of rods h^4 which project at their free ends into and under the edge of the boxes *h*. The two pins *g* in the face of the gear wheel G extend between the two rods *h* on the opposite sides of the disk thus locking the gear wheel to the axle.

In the operation of the motor, the motion of the armature shaft is transmitted to the gear G, thence through the pins *g* and rods h^4 to the disk, and finally to the car axle. It will be observed that the rods h^4 rest against the cushions *h'* and thus sudden strains are to an extent cushioned. Whenever the car wheels run over irregularities in the road-bed or on the track, or strike obstructions thereon, the movement which they are caused to take is not imparted to the motor nor to the gearing. The springs *f'* protect the motor directly, and the cushions *h'* in the disk and the radial movement which the pins have between the rods protect the gearing. It will thus be seen that I have provided a truck having two axles directly connected with a single motor, and have made this possible by providing the necessary flexible joints and connections. The gear wheel being mounted upon the sleeve which is positively connected with the motor, makes both these parts move together.

Having thus described my invention, I claim—

1. In an electric car truck, the combination of a motor having two armatures and a single field magnet, two axles geared respectively to the armatures and a flexible connection between each armature and its corresponding axle, substantially as described.

2. In an electric car truck, the combination of a motor having two armatures and a single field magnet, and two axles driven respectively by said armatures, the said motor being mounted upon or supported by the axles, by means of a flexible connection therewith.

3. In an electric car truck, the combination of a motor having two armatures and a single field magnet and two axles driven respectively by said armatures, the said motor being mounted upon or supported by the axles, by means of a flexible connection therewith, there being also a flexible connection between each armature and its corresponding axle, substantially as described.

4. In an electric car truck, the combination of a motor and an axle with a connection between the two, consisting of the plate *d'* of non-magnetic material, and two castings bolted thereto provided with cups above and below the axle, springs located in said cups and bearing upon the axles, and guides in the castings in which the axle slides, substantially as described.

5. In a car truck, the combination of an axle, a disk rigidly fixed thereon, two pairs of parallel rods flexibly connected with the disk and located upon opposite sides of the center, a gear wheel loosely mounted upon the axle and provided with two pins at diametrically opposite points, said pins projecting between the rods on the disk for the purpose of connecting the disk and gear wheel together, substantially as set forth.

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

CHARLES F. WINKLER.

Witnesses:

D. G. ATKINS,

AUGUSTUS SCHOONMAKER.