(No Model.)

C. F. WINKLER.

ELECTRIC LOCOMOTIVE.

No. 510,947. Patented Dec. 19, 1893.

Fig. 1.

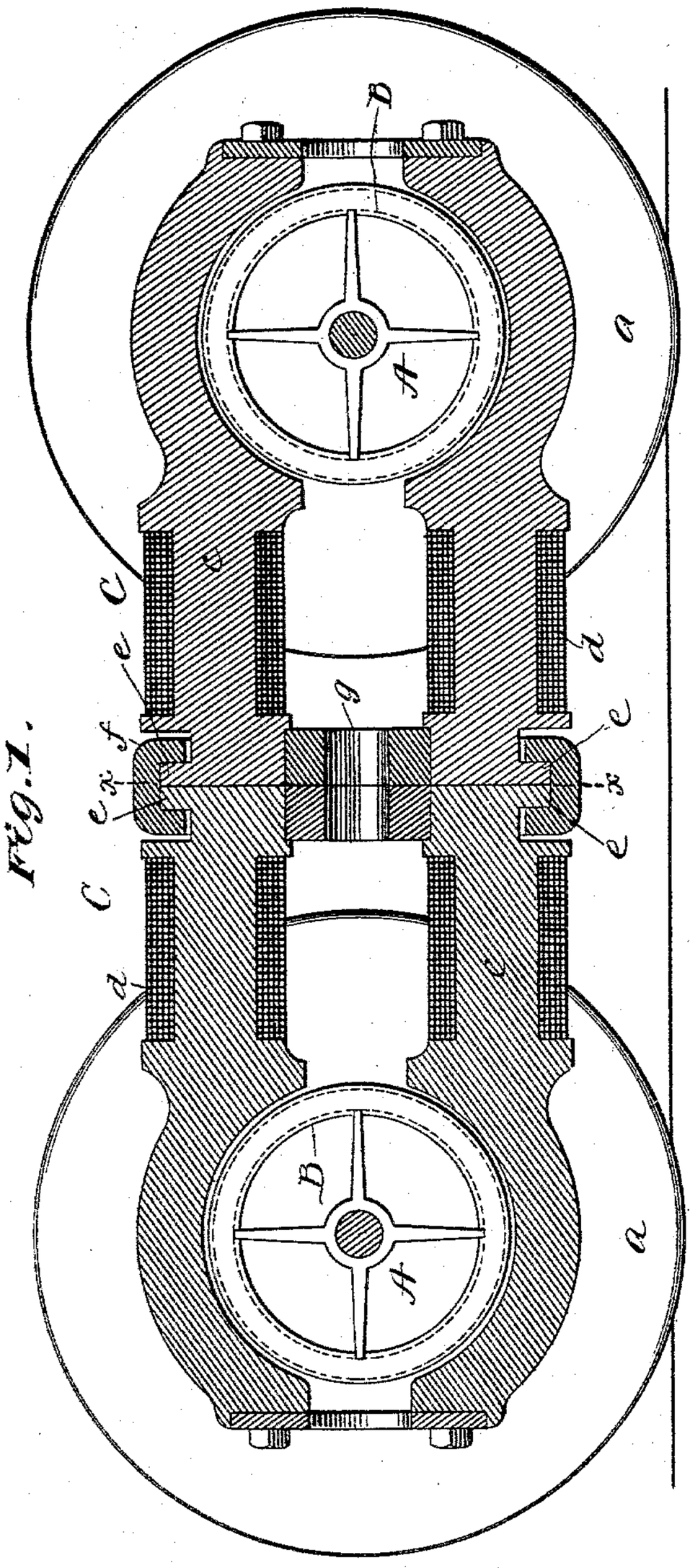
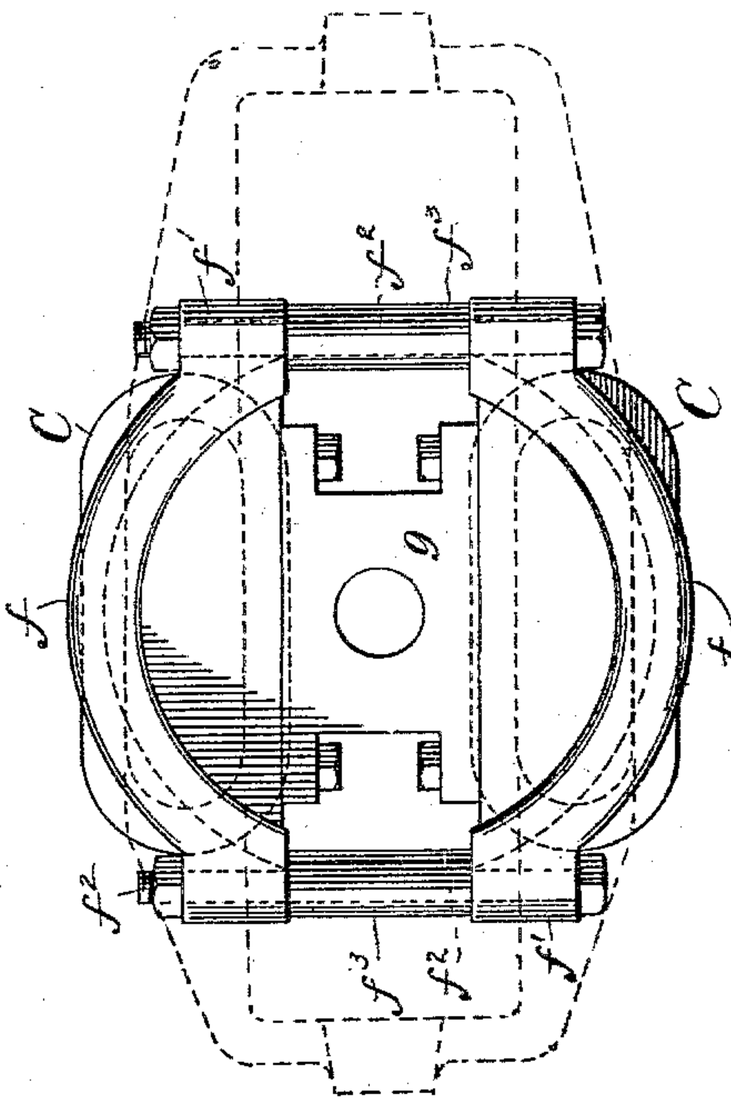


Fig. 2.



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ELECTRIC LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 510,947, dated December 19, 1893.

Application filed March 11, 1893. Serial No. 465,621. (No model.)

To all whom it may concern:

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

My invention relates to electric motors and their application to cars. It relates more particularly to the construction of the motor, the type of motor being that described in my application filed May 24, 1892, Serial No. 434,163. The motor described in that application comprises two armatures located, respectively, on two axles of a car, and a single field magnet in which there is but a single magnetic circuit which includes both armatures. The field magnet consists of two bodies of iron surrounded by coils of wire, rigidly connected together and supported upon the car axles. In such a structure it is necessary that the axles shall always be in the same horizontal plane. Otherwise the field magnet structure would be subject to severe strain. As it is impossible to maintain the road-bed perfectly accurate these strains will necessarily occur.

The object of this invention is to be able to utilize the type of motor described in said application, and to this end consists of certain modifications in the construction of the motor whereby the axles may be permitted to move out of the coincident planes without subjecting the parts to strain.

The invention will be described in detail with reference to the accompanying drawings, in which—

Figure 1 represents a transverse section through the motor and car-axles, and Fig. 2 represents an end elevation of one-half of the motor separated on the line X—X of Fig. 1.

Referring to the drawings by letter, A A respectively represent the two axles of a car;—*a*, *a*, represent car wheels carried thereby. Mounted directly upon each axle is a rotary armature B.

C represents the field magnet of the motor, under the influence of which both armatures are placed. Magnetically speaking, this field magnet consists of two iron bodies, *c*, *c*, located on opposite sides of the armatures, and supported upon the axle by means of bolsters or other devices connecting offsets or brackets, shown in dotted lines in Fig. 2, attached to the sides of the pole-pieces. Each of these iron bodies is surrounded by coils of wire, *d*, through which the electric current passes in such a direction as to establish a single magnetic circuit which includes both iron bodies and the armatures in series. On the line X—X of Fig. 1 the two iron bodies are separated but abut squarely against each other, the abutting surfaces being smooth and in intimate contact. The abutting ends are provided exteriorly with flanges, *e*, which are surrounded and held together by curved yokes, *f*, having a U-shaped cross section. The extremities of the yokes have formed upon them bosses, *f'*, which are perforated vertically to receive bolts, f^2. Two of these bolts are used one on each side, and their purpose is to clamp the two yokes,—which stand diametrically opposite each other—together, and thus couple the parts of the field magnet. These bolts are of brass, and between the yokes they are surrounded by brass sleeves, f^3, which limit the amount of clamping pressure which may be put upon the field magnet parts. In the same plane with these yokes and between the iron parts of the field magnet are inserted two brass or other non-magnetic spacing blocks, *g*. The flanges *e* and the yokes are formed on concentric circles, the center of which is in a line drawn through the two car axles. The energizing coils, *d*, are located on each side of the joint.

It will now be obvious that if the car travels over inaccuracies in the road-bed, so that one or more wheels will drop below the others, the axles are free to assume corresponding positions, and the two ends of the motor, in following the axles, will twist or slide upon each other at the joint, and will suffer no ill effects from strain. The yokes hold the parts together, and at the same time permit them to move upon each other. When the abutting surfaces are made true, the joint will offer very little resistance to the lines of force, and in fact, when the magnets are energized the contact between the parts is much more perfect than when they are de-energized.

It will be observed that although I have

described this motor as connected directly upon the axles, separate armature shafts may be provided which shall gear to the axles through any suitable train.

Having described my invention, I claim—

1. A single electric motor provided with two rotary armatures geared respectively with two car axles, and with a single field magnet acting upon both of said armatures, said field magnet being formed in two parts flexibly connected together, in combination with said car axles, substantially as set forth.

2. The combination with two car axles, of an electric motor having a field magnet rigidly connected to both axles and provided with a joint which permits the axles to move out of coincident planes and thereby cause the parts to slide or twist upon each other, substantially as described.

3. An electric motor having a field magnet consisting of two substantially parallel iron bodies, each of which is divided into two parts and connected rigidly and respectively to two supports which are movable with respect to each other, said parts being connected together by a yielding joint, substantially as and for the purpose set forth.

4. In an electric motor, a field magnet having two abutting parts each of which is provided with a flange in combination with a yoke or collar surrounding and embracing said flanges to hold the parts together.

5. In an electric motor, a field magnet consisting of two parallel iron bodies surrounded by coils of wire and mechanically connected together to form one structure, the same being divided into two parts which abut against each other to maintain the magnetic circuit, the abutting edges provided with flanges, in combination with yokes which surround and embrace said flanges, the yokes being clamped together, substantially as described.

6. The combination of two car axles, a motor armature geared or otherwise connected to each, a field magnet structure having a single magnetic circuit which includes both armatures in series, the field magnet having a yielding joint between the axles, substantially as described.

7. An electric motor, having two armatures included in a single field magnet circuit, two car axles respectively connected with said armatures and a field magnet divided into two parts, magnetically connected together, the joint being yielding and in a vertical plane substantially as described.

8. The combination of two armatures and a single field magnet structure acting upon both, said field magnet being divided at a point between the armatures and parallel to their shafts, the parts being held in contact with but permitted to slide upon each other.

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

CHARLES F. WINKLER.

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