No. 731,365. PATENTED JUNE 16, 1903.

A. A. HONEY.

ELECTROMAGNETIC TRACTION INCREASING APPARATUS.

APPLICATION FILED DEC. 28, 1901. RENEWED NOV. 25, 1902.

NO MODEL.

Fig. 1.

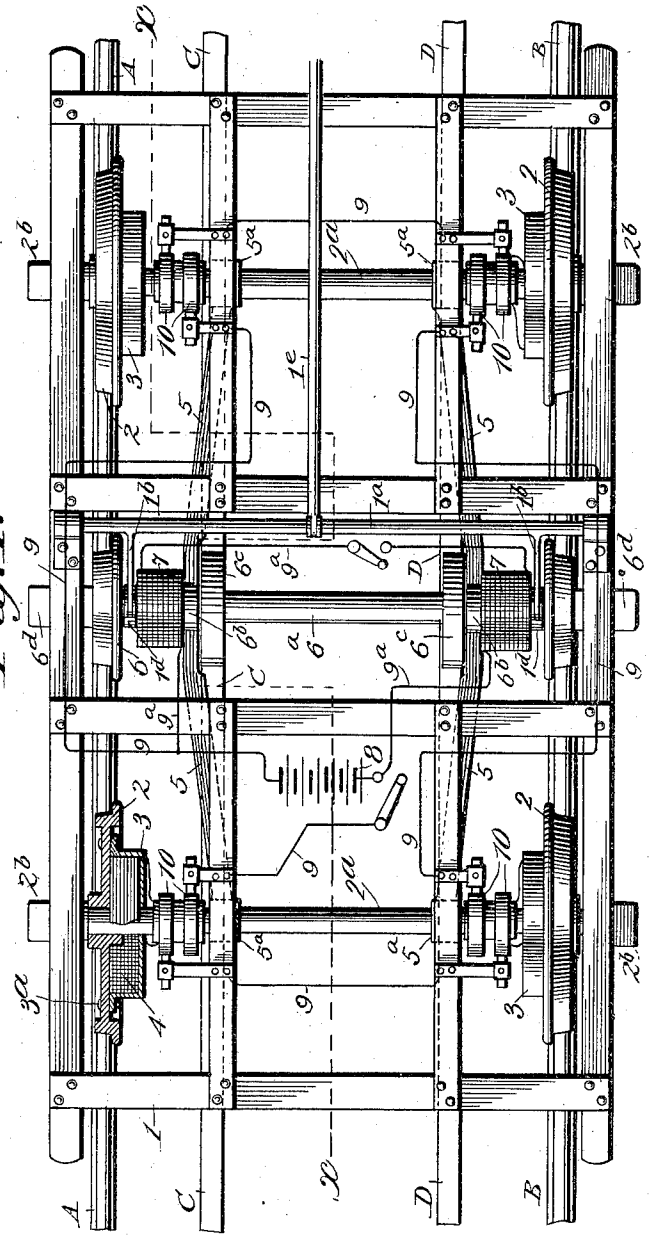
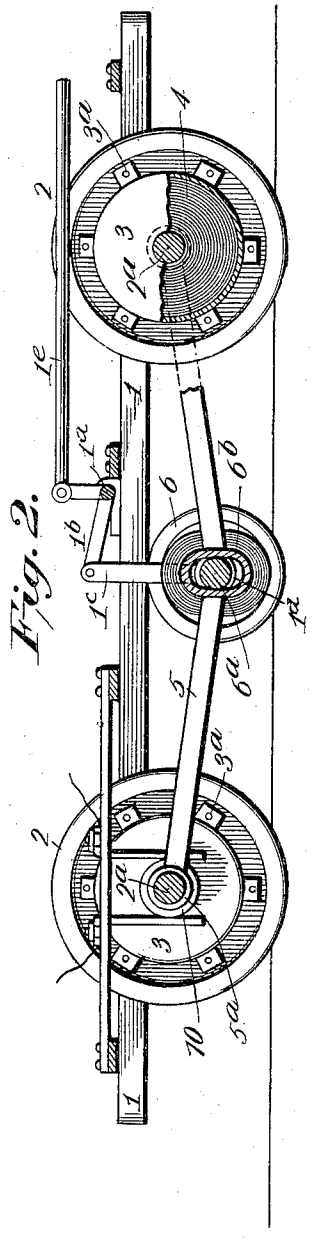


Fig. 2.



Witnesses

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No. 731,365. Patented June 16, 1903.

UNITED STATES PATENT OFFICE.

ALBERT A. HONEY, OF TACOMA, WASHINGTON, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MAGNETIC EQUIPMENT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF SOUTH DAKOTA.

ELECTROMAGNETIC-TRACTION-INCREASING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 731,365, dated June 16, 1903.

Application filed December 28, 1901. Renewed November 25, 1902. Serial No. 132,834. (No model.)

To all whom it may concern:

Be it known that I, ALBERT A. HONEY, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Electromagnetic-Traction-Increasing Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part thereof.

My invention relates to a system of electromagnetic traction for railroads, having for its object the increase in traction between the wheels of cars and the rails by the influence of magnetism, and is an improvement on the device described in my Patent No. 683,283, granted September 24, 1901. In my said former patent is shown an electromagnetic-traction-increasing apparatus with sectional magnets or helices mounted upon each supporting-axle, the latter being relatively far apart, there being a bridge of magnetizable metal connecting the magnets or helices of the two axles and wires for connecting them up in a common circuit, so as to convert each two axles, with their supporting-wheels, into two horseshoe-magnets.

In my present invention in order to increase the efficiency by bringing the poles of the magnets closer together without changing the relative position of the supporting-axles I interpose an idler-axle with flanged supporting-wheels adapted to run on the main rails, broad contacting-wheels arranged to bear on secondary rails laid between the main rails, an exciting helix or helices therefor, and a connecting-bridge of magnetizable material, so that in a four-wheel truck there will be four horseshoe-magnets, in effect, with the poles of each one-half the distance apart they would be if no intermediate axle were used. By this arrangement a large increase in the amount of contact-surface between wheels and rails is obtained. In other words, all the magnetic influence created is utilized. The secondary rails will be used on such parts of a railway system where extra traction is desired—such as heavy grades, places where it is difficult to start or stop, &c.—and will in general be connected magnetically with the main rails.

It has been found that from four to six times the amount of magnetic tractive influence is gained by the use of the idler-wheels and secondary rails over other forms devised and patented by me.

In the accompanying drawings, Figure 1 is a plan view, partly in section, of the frame and truck of an ordinary street-car. Fig. 2 is a sectional elevation on the line $x\,x$ of Fig. 1, a portion being broken away.

Similar reference characters indicate similar parts in the respective figures.

Referring to the drawings, A B represent the main rails of a railway-track, and C D the secondary or contact rails, made of Norway iron or other iron or steel, laid between the main rails and parallel to them.

1 represents the main portions of the framework of a street-car, to which my invention is shown adapted, although it is equally adaptable to railway or other cars of a different type.

2 2 represent the supporting-wheels, which are suitably mounted on axles 2^a, having bearing-boxes 2^b, which travel on the main rails A B. Each axle and the wheels thereon are suitably energized by a helix or coil, which is preferably in two parts. Each part may be mounted upon a tubular sleeve, as is illustrated in the aforementioned Letters Patent; but my preferred arrangement is that shown in the accompanying drawings.

Secured to each of the wheels 2 2 is a box 3, made of non-magnetizable metal, secured to the web of the wheel by bolts 3^a.

4 represents a magnet or helix which is mounted in two sections on each axle, each section of each magnet or helix being wound upon a wheel within a box 3.

5 is the bridge, of which two are shown instead of the single one of my prior patent. Each bridge is of course made of magnetizable iron and engages at its extremities with the axle in the form of a bearing 5^a. This bearing has such extent of surface and a close enough fit to prevent serious interruption of the magnetic current which flows therethrough.

On an idler-axle 6^a, turning in bearing-boxes 6^d, are mounted two pairs of wheels 6 6 and 6^c 6^c, preferably cast from Norway iron

and in one solid piece. The wheels 6 6 are flanged and run on the main track A B. The contacting wheels 6^c 6^c, which are nearer the longitudinal center of the car, are broad and unflanged and travel on the secondary rails C D. Between the wheels 6 and 6^c, on each side of the car and surrounding the idler-axle 6^a, is a coil or helix 7, rigidly secured to the car-truck 1. A coil may also be placed around the axle 6^a at the center. The coils or helices are wound on elongated sleeves 6^b, each sleeve being connected to a bridge-piece 5 to permit the idler-axle 6^a to rise and fall within the sleeves as the wheels run over the rails and to enable the said wheels to be raised therefrom. If desired, the helices may be fixed to the axle or wheels in the manner shown in connection with the supporting-wheels 2 and the current fed to the helices by brushes, as hereinafter described.

8 is a source of electrical supply, 9 a circuit from said supply to the helices 3 on the supporting-wheels, and 9^a a circuit from the same source to the helices 7, surrounding the idler-axle. Separate switches are employed for closing the circuits, as it is not always necessary to use the supplemental magnets—that is to say, those formed by the idler-axle and its wheels.

In order that the circuit may not be broken between the fixed framework 1 and the rotating helices 4, an arrangement of brushes attached to the framework in connection with the rings 10, insulated from the axles, is employed. This is a well-known expedient and need not be further described. The helices upon each supporting-axle are preferably wound in the same direction and in opposition to those which are wound upon the intermediate axle. This will convert the axles, wheels, and bridge upon each side of a four-wheel truck into two horseshoe-magnets, the central axle forming one pole of each.

When the car is running on an even grade, it is desirable to lift the idler-wheels 6 and 6^c from the track to avoid friction and wear. For this purpose the device illustrated may be used. A cross-shaft 1^a, supported in bearings on the car-truck 1, is provided with an arm 1^b near each end, from each of which depends a pivoted link 1^c to a collar 1^d, surrounding the idler-axle 6^a. An upright arm 1^e rises from the cross-shaft 1^a and is attached to one end of a rod, the operation of which raises and lowers the idler axle and wheels.

The form in which my invention is here shown is one of many in which it may be embodied. As here illustrated, the bridges are shown attached inside of the wheels; but they may, if desired, be secured outside or may form a part of the framing 1. In lieu of the rotating helices upon the supporting-wheels fixed helices may be employed.

Other changes in construction and arrangement may be made in this device without departing from the spirit of my invention; but such changes or deviations as may suggest themselves to the skilled mechanic without the exercise of invention are considered by me to be within the scope of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In an electromagnetic-traction-increasing apparatus, the combination of supporting wheels and axles, intermediate idle wheels and axles, a magnet or helix mounted upon each axle, a connecting bridge or bridges of magnetizable material, and wires by means of which the magnets are connected in a common circuit, so that a plurality of horseshoe-magnets will be formed, each having two coils, one of which is that which energizes the idle wheels, substantially as set forth.

2. In an electromagnetic-traction increaser, the combination of the main wheels and axles, helices on the axles, an idler-axle carrying two sets of wheels, helices on the idler-axle, and means for energizing the helices, substantially as set forth.

3. A railway-car supported on wheels and axles, an idler-axle, wheels on the idler-axle, in line with the supporting-wheels, other wheels on the axles, helices surrounding the idler-axle, and means for energizing the helices, substantially as set forth.

In testimony whereof I hereunto set my hand and seal.

ALBERT A. HONEY. [L. S.]

Witnesses:

BYRON BARLOW,

ALEXANDER REITH.