No. 804,371. PATENTED NOV. 14, 1905.

H. BEHAN.

ELECTROMAGNETIC WHEEL.

APPLICATION FILED JAN. 6, 1905.

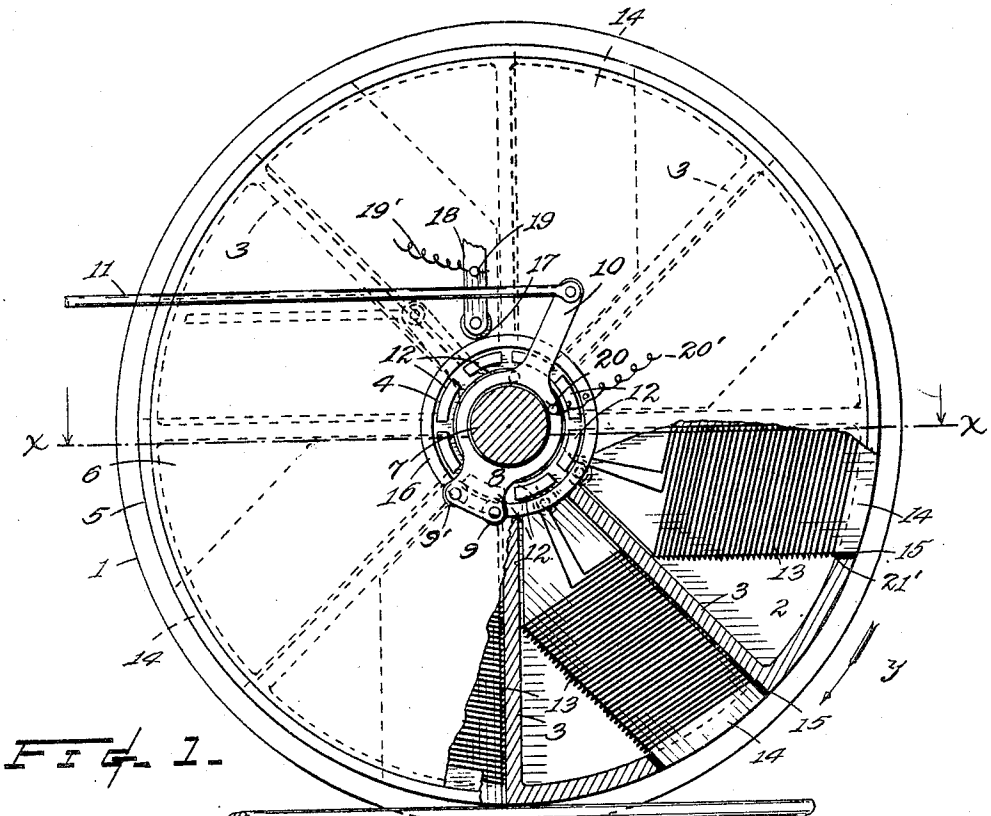


Fig. 1.

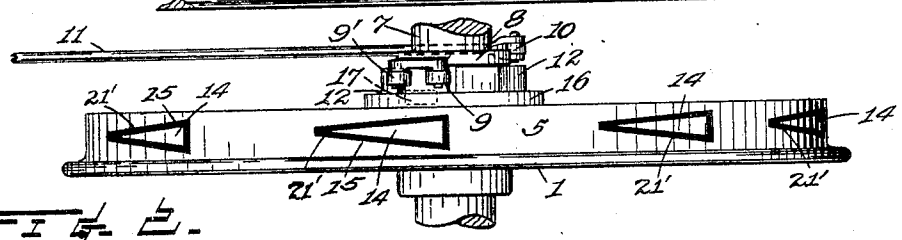


Fig. 2.

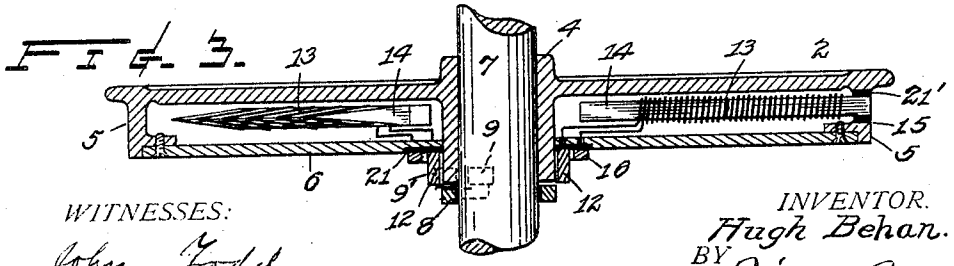


Fig. 3.

WITNESSES:

John Todd

F. Dudley Moss.

INVENTOR.

Hugh Behan.

BY Pierre Barnes

ATTORNEY.

UNITED STATES PATENT OFFICE.

HUGH BEHAN, OF SEATTLE, WASHINGTON.

ELECTROMAGNETIC WHEEL.

No. 804,371. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed January 6, 1905. Serial No. 239,890.

To all whom it may concern:

Be it known that I, HUGH BEHAN, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Electromagnetic Wheels, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this invention is to provide efficient and economical means for driving a car-wheel in either direction interchangeably by electromagnetic force and also for retarding or overcoming such motion, whereby the car may easily ascend or descend comparatively steep inclines without the wheels slipping or, at least, to a very slight degree.

The invention consists in the novel construction, adaptation, and combination of parts, substantially as hereinafter described, and illustrated in the accompanying drawings, wherein—

Figure 1 is side elevation, partly in section, of a car-wheel, showing an embodiment of my invention. Fig. 2 is an under side view of the same. Fig. 3 is a cross-sectional view taken on line x x of Fig. 1.

The reference-numeral 1 represents a car-wheel provided with a web 2 and radial arms 3, integrally connecting the hub 4 with the rim 5, and having a removable cover-plate 6. The wheel is mounted, as usual, upon an axle 7, which is journaled in suitable boxes of the car-truck. Rotatably mounted and insulated from this axle is a brush-holder 8, carrying contact-rollers 9 and 9′, and an arm 10, whereby it is connected, through a rod 11, with an actuating-lever positioned within easy reach of the operator. The said rollers during the rotation of the wheel successively engage with contact-segments 12, secured to the latter, and are respectively connected to ends of wire coils 13 of electromagnets located within the chambers of the wheel between the said arms thereof. The cores 14 of these magnets extend through apertures 15 of the rim 5 to its outer periphery and are preferably formed triangular in cross-section and disposed so that their apexes will be directed toward the normal direction of travel or revolution, as indicated by the arrow y in Fig. 1, in order that when thus revolving the points will be first presented and having less metal thereat will cause a drawing action toward their enlarged following ends—that is to say, as between the magnets and the track-rails—and thus rotate the wheel. The other ends of the several coil wires are connected to an annular-shaped metal terminal 16, which is in continuous contact with a roller 17, rotatably supported by a hanger 18, secured to the wheel-truck or car-body. Binding-posts 19 and 20 are respectively provided for the said hanger and the brush-holder, whereby the electric circuit or conducting wires 19′ and 20′, leading from the source or reservoir of the actuating-current, may be reliably connected to the magnet-terminals aforesaid. These terminals and also the outer ends of the said cores are separated from the adjacent portions of the wheel by intervening pieces of insulating material 21 21′ 21″.

The operation of the invention is as follows: Assuming the brush-holder to be in the position indicated by full lines in Fig. 1, then the magnets connected to the contact-segments engaged with the rollers of the brush-holder are energized and being in the drawing to the left of a plane projected upwardly through the wheel-axis will be drawn toward the rail and cause the wheel to rotate in a direction opposite to that of the arrow y, an operation utilized in descending an incline or for overcoming the turning momentum of the wheel when stopping the car. By oscillating the brush-holder to the position represented by broken lines in this figure the magnets upon the opposite side are energized and the direction of motion will correspond with the said arrow, as would be done in ascending an incline, and furnish power supplemental to the propelling-motor of the car, while the brush-holder if held intermediate of the illustrated positions will so actuate the magnets below as to balance their rotative forces and acts simply to retain the car upon the track.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus of the class described, the combination with the track-rail, the wheel, and the electric conducting-wires, of a plurality of electromagnets having their cores extending through the rim of said wheel and the coils terminating in an annular piece of metal and a series of contact-segments secured to said wheel, a terminal of the said conducting-wires which makes continuous contact with said annular piece, another terminal of the conducting-wires engaging with the said contact-segments, and means for adjusting said last-named terminal so as to cause it to engage with certain predetermined

of said contact-segments, substantially as described.

2. In an apparatus of the class described, the combination with a wheel, electromagnets mounted radially on the wheel, an annular rotary contact, segregated rotary contacts revoluble with the wheel, an adjustable contact adapted to engage said segregated contacts, whereby, through the movement of said adjustable contact, an electric magnet may be energized in front of or in rear of the bearing-point of the wheel.

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

HUGH BEHAN.

Witnesses:
PIERRE BARNES,
F. DUDLEY MOSS.