

(No Model.)

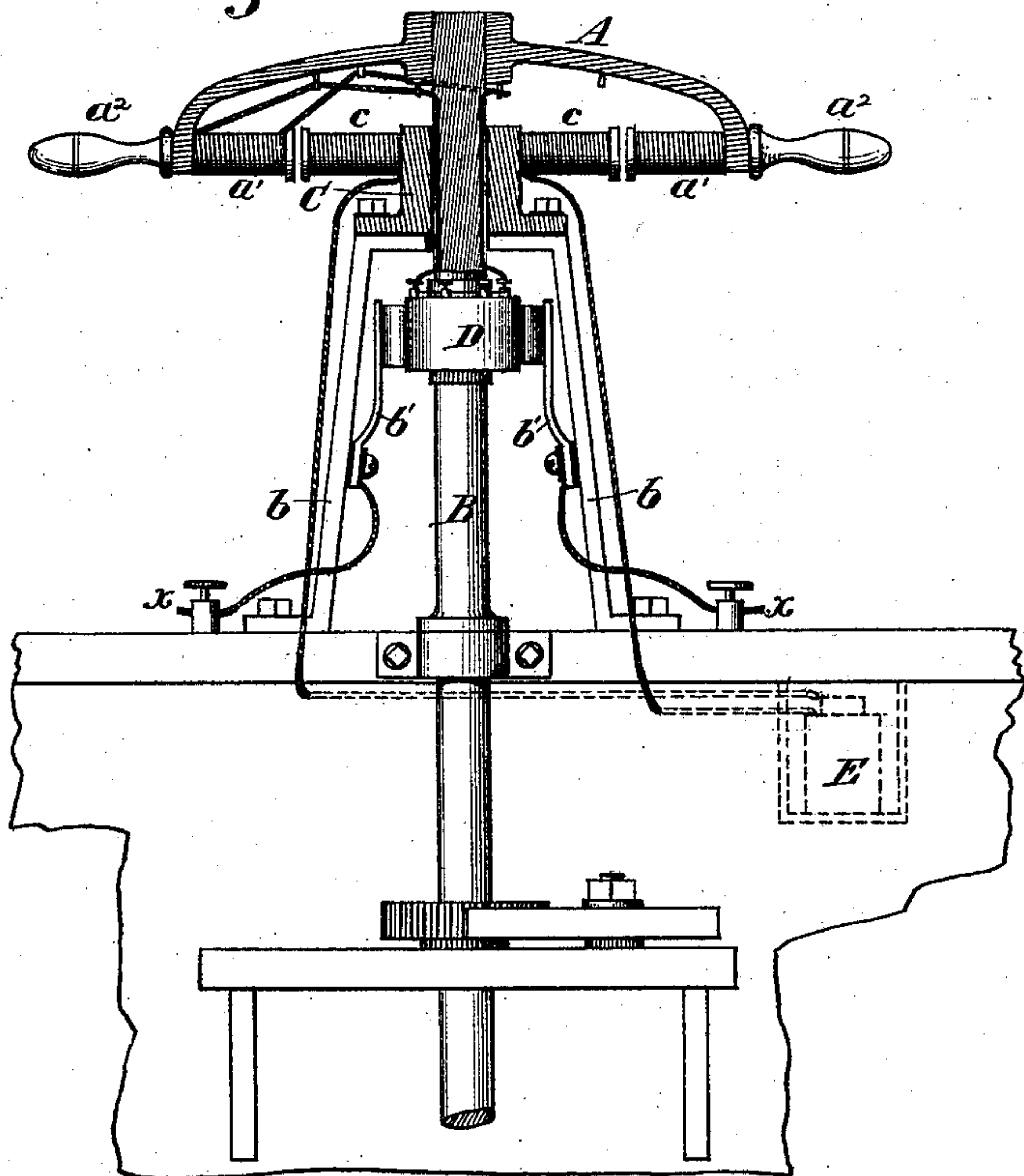
H. WALTER.

ELECTRO MAGNETIC BRAKE.

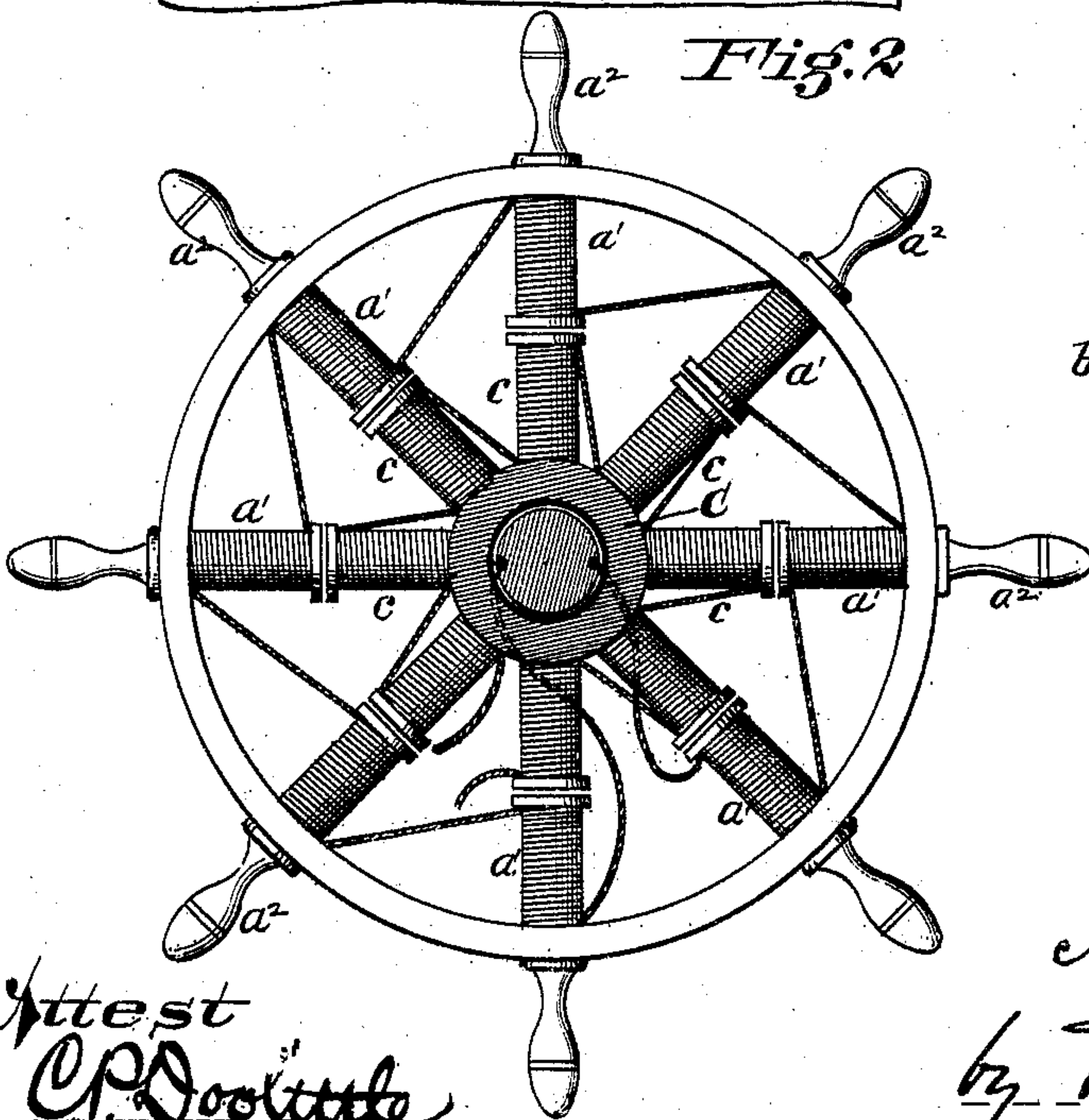
No. 248,238.

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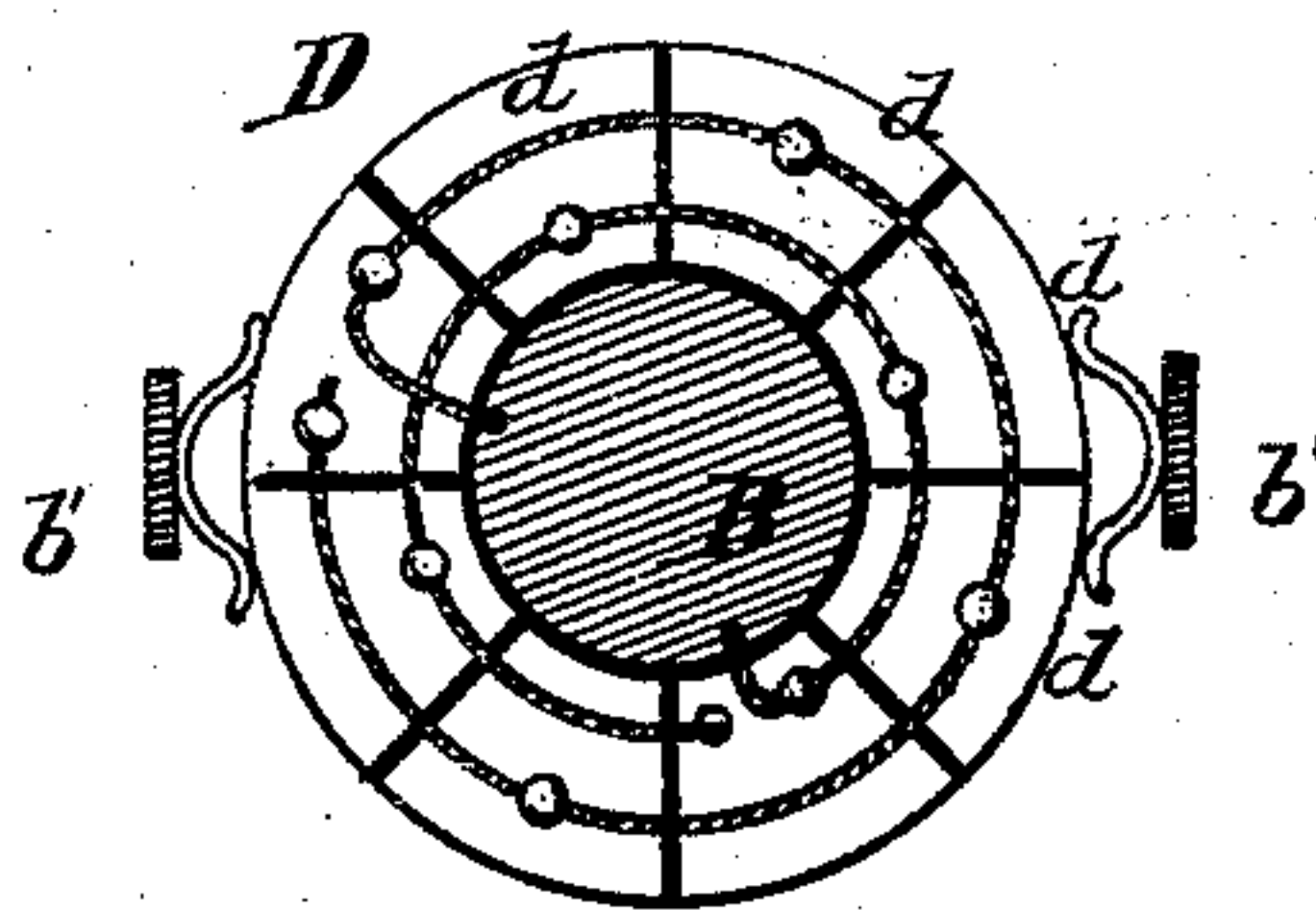
*Fig. 1*



*Fig. 2*



*Fig. 3*



*Attest*

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# UNITED STATES PATENT OFFICE.

HUGO WALTER, OF CINCINNATI, OHIO.

## ELECTRO-MAGNETIC BRAKE.

SPECIFICATION forming part of Letters Patent No. 248,238, dated October 11, 1881.

Application filed May 26, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HUGO WALTER, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented  
5 new and useful Improvements in Electro-Magnetic Brakes, of which the following is a specification.

My invention relates to means for operating railway-car brakes by electro-magnetic force,  
10 its object being to provide a practicable, efficient, and economical means of applying the power developed by a battery, dynamo-machine, or other generator of electricity to the braking of railway cars and trains.

15 To this end my invention consists in a novel construction of braking apparatus, wherein the electro-magnetic force is applied directly to the shaft of an ordinary hand brake-wheel, or to the hand brake-wheel itself, which, for the purpose, is constructed in the form of a rotary  
20 electro-magnetic motor; and, also, in the construction and arrangement of the other parts and details of the apparatus, as more particularly hereinafter pointed out.

25 My invention is embodied in mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus, showing the brake-wheel in section. Fig. 2 is  
30 a plan view of the brake-wheel motor as appearing at the under side, and Fig. 3 a plan view of the commutator or pole-changer.

Similar letters designate in the drawings the parts referred to in this specification.

35 A in the drawings designates the brake-wheel, whose construction will be described later. It is attached rigidly to the brake-rod B, in the usual manner, the latter being held in rigid bearings, and provided in all respects  
40 for operation by hand, as is customary. The wheel A is preferably of an inverted-dish form, provided externally with radial handles  $a^2$ , for convenience of manipulation when the brakes are to be operated by hand, and with radial  
45 arms  $a'$  extending inwardly in a horizontal plane from the rim, which serve as the helix cores of electro-magnets. The wheel A, with its arms  $a'$   $a^2$ , may be cast in the required form. The arms  $a'$  are then wound with a con-  
50 tinuous insulated wire, constituting them a

series of electro-magnets with the terminals of the wire carried to and suitably connected with a commutator or pole-changer, D, rigidly secured at a convenient point upon the shaft B, where, by means of metallic brushes, contact  
55 is made for the binding-posts  $x$   $x$ , and thence with the battery or generator under control of the attendant. This portion of the apparatus operates in connection with a series of permanent magnets or permanently-charged electro-  
60 magnets,  $c$ , mounted radially in a horizontal plane upon a head, C, and arranged to register with the magnets  $a'$  of the wheel A, with which the head C is concentric. The head C is rigidly secured upon an insulated bracket,  
65  $b$ , or other proper support upon the car, and remains fixed, its magnets being also wound with a continuous insulated wire, whose ends are carried to and connected with a permanent  
70 battery, E, (indicated by dotted lines,) placed at some convenient point upon or in the car.

The parts A and C, with their magnets, as will be readily understood, are arranged as in the case of a rotary electro-magnetic motor, the poles of the rotating member A passing  
75 those of the fixed member C, nearly, but not quite, in contact, being driven by the alternate changes of polarity in the magnets of the rotating member, which is effected by the com-  
80 mutator or pole-changer D in the following manner: The latter consists of a series of segments,  $d$ , preferably of brass, corresponding in number with the magnets  $a'$ . The segments are insulated from each other, and form, when  
85 placed together, a cylinder or collar rigidly secured upon but insulated from the brake-shaft B, with which it and the wheel A revolve. Alternate segments  $d$  are electrically connected in such manner that the positive current from  
90 the generator will pass through one series and the negative current through the alternate series, the ends of the helix  $a'$  being connected respectively with one and the other series of connected segments.

Fixed spring contact strips or brushes  $b'$  are  
95 arranged to operate upon the external periphery of the cylinder D at opposite sides, one being in contact with one set of segments while the other is in contact with the other set, but never in contact with the same set at the same  
100



time. These brushes may be attached, as shown, to the sides of the bracket *b*, and are connected thence to binding-posts *x x* and to the generator under control of the attendant.

5 The parts are so arranged that by the rotation of the wheel-shaft B and the commutator D, the polarity of the currents passing through the helices of the electro-magnets *a'* is changed at proper intervals, and by alternate attraction  
10 and repulsion rotate the wheel A.

The charging power may be a battery dynamo machine or generator of any kind under control of the engineer or conductor, the currents being transmitted from car to car by wire  
15 or other conductors in any convenient manner.

It will be seen that the brake mechanism remains in its normal condition ready to be operated by hand in any emergency by means of the handles *a*<sup>2</sup>, and the usual ratchet-wheel  
20 and pawl for retaining the brakes when set.

It will be obvious that the outer magnets, *a'*, may be constituted the permanent magnets, and the inner ones arranged to be charged by the temporary currents; also, that the rotary  
25 motor may be arranged separately from the

brake-wheel or upon a counter-shaft and transmit its power by gearing; but the arrangement shown is deemed preferable.

Having described my invention, I claim and desire to secure by Letters Patent—

1. In combination, with the winding-shaft and brake mechanism of a railway-car, an electro-magnetic motor arranged upon the winding-shaft and adapted to be used as a hand-wheel or electric motor at will, substantially  
35 as specified.

2. In the brake mechanism of a railway-car, the concave-wheel A, provided with inner radial magnets, *a'*, and external handles, *a*<sup>2</sup>, in combination with the winding-shaft B and the  
40 fixed head C, provided with magnets *c*, substantially as specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HUGO WALTER.

Witnesses:

C. P. DOOLITTLE,

L. M. HOSEA.