

(No Model.)

A. VANDERBECK.  
ELECTRIC BRAKE MECHANISM.

No. 601,992.

Patented Apr. 5, 1898.

Fig. 1.

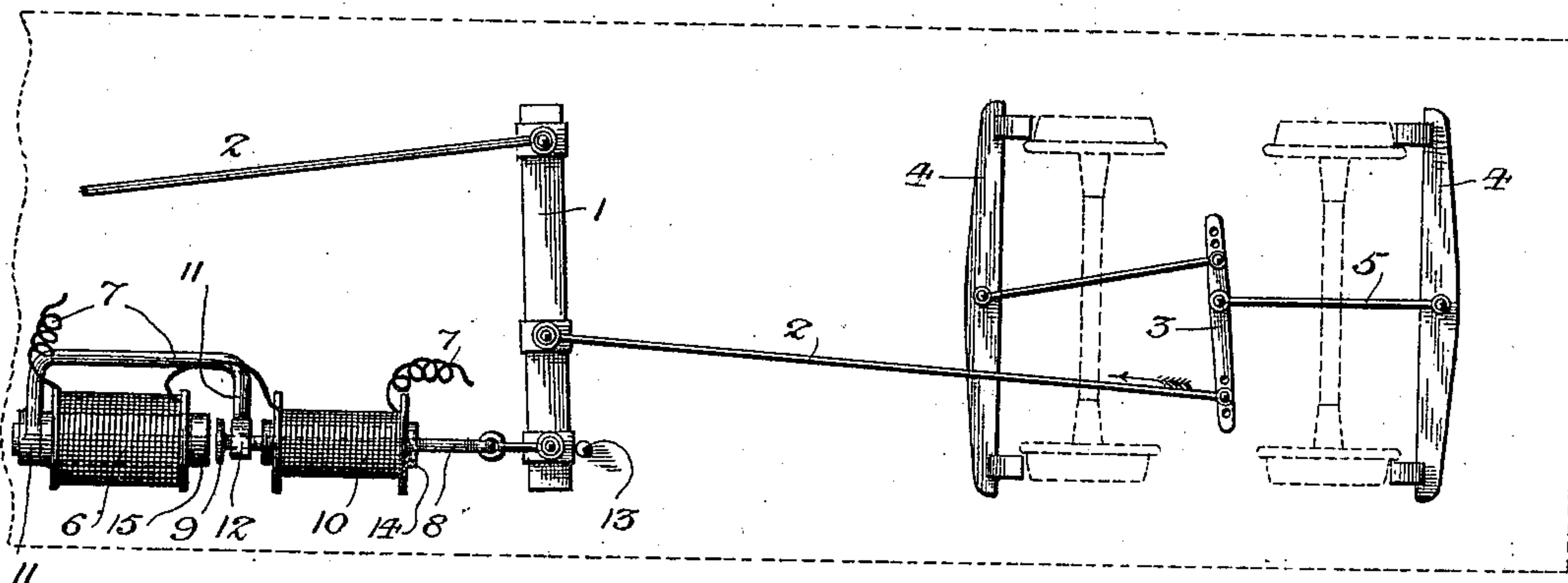


Fig. 2.

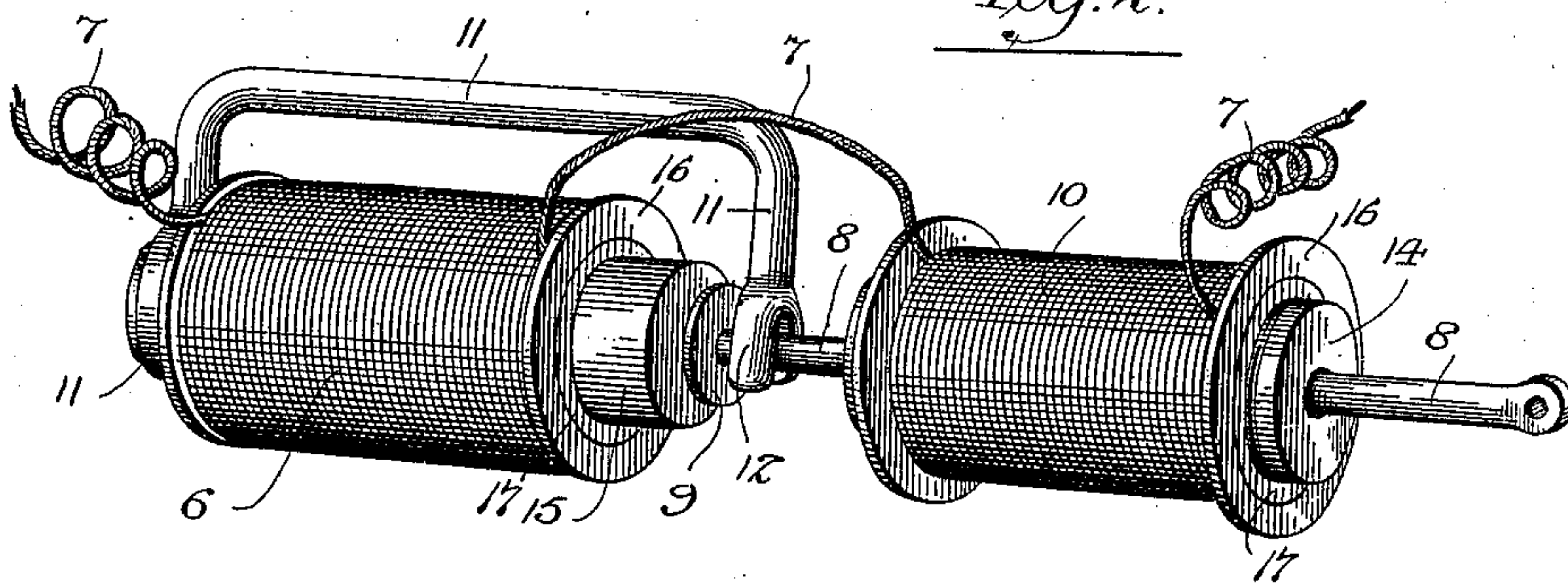
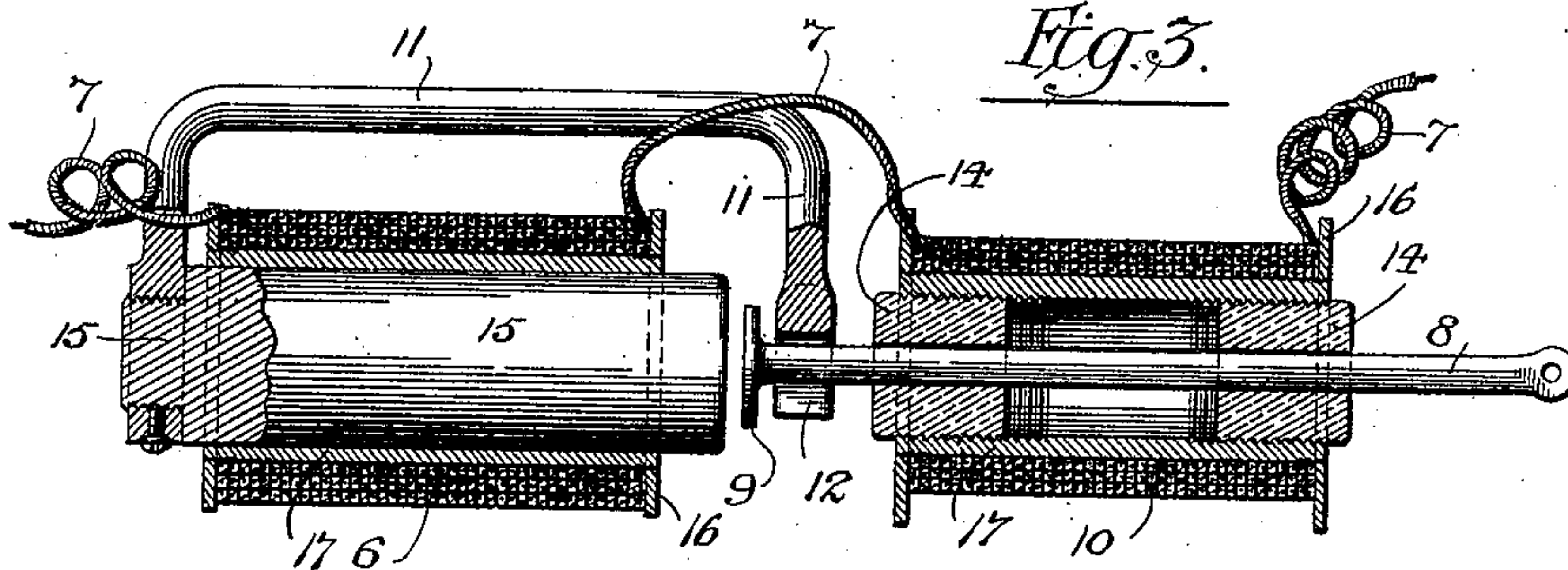


Fig. 3.



Witnesses:-

*Wm. F. Whitehead.*

By His Attorneys,

*C. A. Snow & Co.*

Inventor:-

*Alexis Vanderbeck*



# UNITED STATES PATENT OFFICE.

ALEXIS VANDERBECK, OF SCAMMON, KANSAS.

## ELECTRIC BRAKE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 601,992, dated April 5, 1898.

Application filed September 13, 1897. Serial No. 651,529. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXIS VANDERBECK, a citizen of the United States, residing at Scammon, in the county of Cherokee and State of Kansas, have invented a new and useful Electric Brake Mechanism, of which the following is a specification.

My invention relates to electric brake mechanism for railway-cars; and the object in view is to provide a simple and efficient construction and arrangement of parts whereby with an electric current of comparatively low voltage the brakes may be operated with sufficient force to accomplish the desired object under the various conditions of railway traffic.

In carrying out my invention I have aimed to utilize not only the attractive force of the unlike poles of two magnets, but the cooperating repellent force of the like poles, the parts being so arranged that the attractive force of unlike poles is assisted by the repellent force of like poles.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a diagrammatic plan view of a brake mechanism and connected operating devices constructed in accordance with my invention. Fig. 2 is a detail view in perspective of the brake-operating devices detached. Fig. 3 is a longitudinal section of the same.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

Referring to Fig. 1, the main brake-lever 1, which may be of the ordinary or any preferred type, is connected by brake-rods 2 with auxiliary levers 3, which in turn have connection with the brake-bars 4 by means of links 5. It will be understood that movement of the free end of the brake-lever in the direction indicated by the arrow in Fig. 1 will set the brakes by moving the brake-bars toward the wheels of the car-trucks, and hence bringing the brake-shoes into contact with said wheels, and in order to accomplish this movement of the free end of the brake-lever I employ brake-operating devices which constitute the subject-matter of my invention, as hereinafter disclosed.

In connection with a main electromagnet 6, having a continuous wire wrapping 7, which may be arranged in circuit with any suitable source of electrical energy, I employ a plunger 8, mounted for movement toward the contiguous pole of said electromagnet and having connection with the above-described brake-lever 1, as clearly shown in Fig. 1. The plunger is preferably provided at that end which is contiguous to the electromagnet with an enlargement or head 9, and in order that the effective force of the plunger and the said main electromagnet may be increased to an efficient extent without employing an electric current of high voltage I preferably polarize the plunger in such a manner that the enlargement or head constitutes a pole which is magnetically unlike the contiguous pole of the main electromagnet. To accomplish this, I employ an auxiliary electromagnet 10, of which the plunger constitutes an axially-movable core, the wrapping of this auxiliary magnet being continuous with that of the main magnet or consisting of the wire 7, the wrapping upon the two magnets being in the same direction, whereby when the magnets are arranged in alignment their contiguous poles are unlike. Thus the contiguous extremities of the fixed core of the main magnet and the movable core of the auxiliary magnet will be mutually attractive, both magnets being arranged in a common electrical current.

I have found it expedient, however, to still further increase the force applied to the movable core of the auxiliary magnet by providing the main electromagnet with a polar extension 11, forming an unwound leg which terminates between the attractive poles of the main and auxiliary magnets and on the opposite side of the enlargement or head of the movable core 8 from the pole of the main magnet. Obviously this extended pole of the main magnet will be magnetically unlike that pole of the main magnet which is designed to attract the movable core 8, and hence will be magnetically like the contiguous end of said core. Hence said extended pole will repel the enlargement or head of the movable core 8 simultaneously with the attraction of said enlargement or head by the wound leg of the main magnet. The main magnet, therefore, is constructed substantially to form what



is known in the art as a "club-foot" magnet, the extremities of its legs being spaced apart, while the plunger, which is designed to actuate the brake-lever, is disposed between said  
5 extremities of the magnet-legs and is polarized to cause it to be repelled by one leg and attracted by the other.

In the construction illustrated the unwound leg or extension of the main magnet is terminally bifurcated, as shown at 12, to allow the  
10 movable core of the auxiliary magnet to pass therethrough without contact, and in order to prevent the head or enlargement of the said movable core from coming in contact  
15 with the unwound leg or extension of the main magnet when the device is thrown out of circuit I preferably employ a stop, which, in the construction illustrated, consists of a pin 13. (See Fig. 1.)

It is obvious that the device as above described is susceptible of numerous modifications in the matter of details; but in practice I have found it desirable in constructing the  
20 auxiliary magnet to fit centrally-perforated plugs 14 in the extremities of the spool or cylinder upon which the winding is arranged, said plugs being permanently screwed to place to prevent disarrangement by jarring  
25 and being designed to maintain the plunger or movable core accurately in an axial position. Obviously the auxiliary magnet is of the "bar" type, its remote pole not being utilized in the construction illustrated; also,  
30 the body portion of the main magnet is of the bar type, and it is preferably constructed of a round soft-metal core 15, fitted within the spool or cylinder upon which the wire winding is placed, said core being firmly secured  
35 against movement by any suitable means. The extension or leg 11 is secured by screws, or equivalent means, to the remove end of the core of the main magnet.

The spools which I prefer to use in connection with the magnets of my brake mechanism preferably have their terminal flanges or  
45 collars 16 threaded upon the barrels 17, and thereby secured against displacement by jarring, said construction being illustrated in Fig. 3. The core 15 of the main magnet is of soft metal, as also is the plunger which  
50 operates in the smaller magnet for communicating motion to the brake mechanism, and the plugs 14, in which the plunger operates, are preferably of brass or an equivalent metal. The relative strengths of the main and auxiliary magnets should be approximately in the ratio of three to one, the additional  
55 strength of the main magnet being attained by multiplying the coils of wire on the spool thereof.

It will be understood that while in the description I have referred to the mechanism embodying my invention as being particularly applicable to brakes for railway-cars  
65 and the like the same is also applicable to other forms of machinery which it may be

required to have under such control as to provide for stopping the same quickly and without the employment of complicated brake mechanism.

Various changes in the form, proportion, and the minor details of construction may be restored to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. An electric brake-operating device, having fixed electromagnets, and a movable plunger operating axially through one electromagnet, with its extremities permanently located  
80 beyond the ends thereof, for attraction by the other, and adapted to be operatively connected with brake mechanism, substantially as specified.

2. An electric brake-operating device having fixed main and auxiliary electromagnets, of relatively different strengths, arranged in alinement, and connected in series, and a  
90 movable plunger operating axially through the auxiliary electromagnet, and terminally disposed for attraction by the main electromagnet, the extremities of said plunger being permanently located beyond the ends of the auxiliary electromagnet, and one of them  
95 being adapted for connection with a brake mechanism, substantially as specified.

3. An electric brake-operating device, having a magnet provided with contiguous spaced poles, and a polarized plunger terminally disposed between the poles of said magnet and  
100 adapted to be operatively connected with the moving parts of a brake mechanism, substantially as specified.

4. An electric brake-operating device, having a "club-foot" electromagnet constructed with the extremity of its unwound leg contiguous to and in alinement with the wound leg, and a polarized plunger terminally disposed between the poles of said magnet for  
110 relative attraction and repulsion thereby, and adapted to be operatively connected with the moving parts of a brake mechanism, substantially as specified.

5. An electric brake-operating device having a main "club-foot" electromagnet provided with a terminally-bifurcated bare leg arranged contiguous to and in alinement with its wound leg, and an auxiliary electromagnet axially alined with the wound leg of the  
120 main magnet, and having an axially-movable core terminally arranged between the poles of the main magnet and permanently out of contact with the like pole, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALEXIS VANDERBECK.

Witnesses:

JOHN MORTON,

JOHN G. McLAUGHLIN.