No. 663,519. Patented Dec. 11, 1900.

R. W. M. SCHIEMANN.

ELECTRIC RAIL BRAKE.

(Application filed May 22, 1899.)

(No Model.)

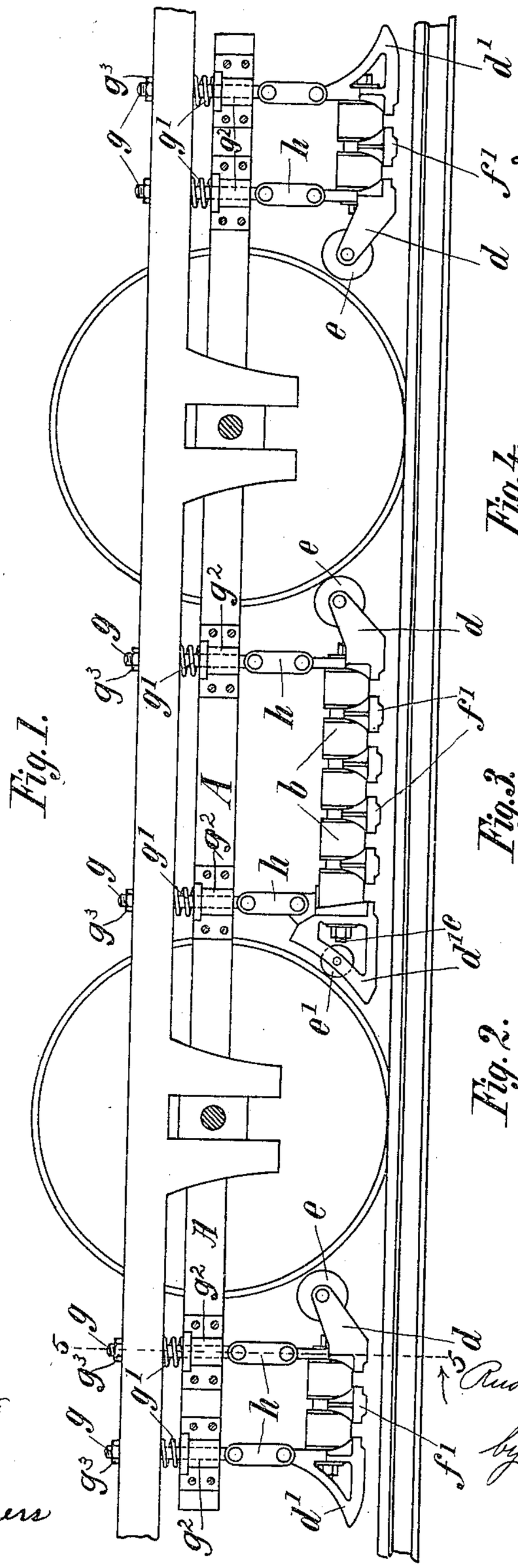

Fig. 1.

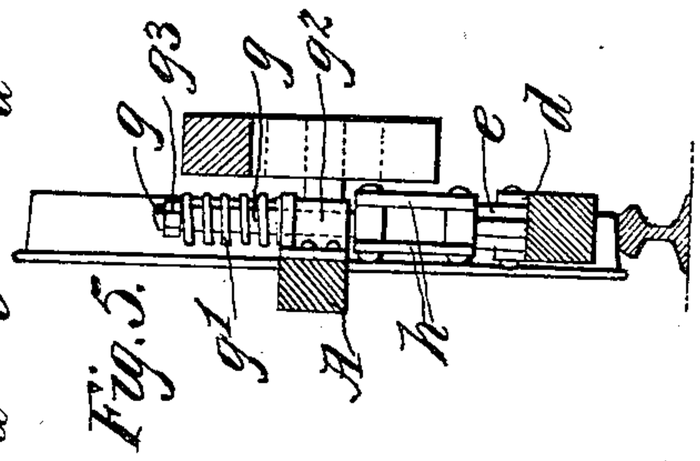

Fig. 5.

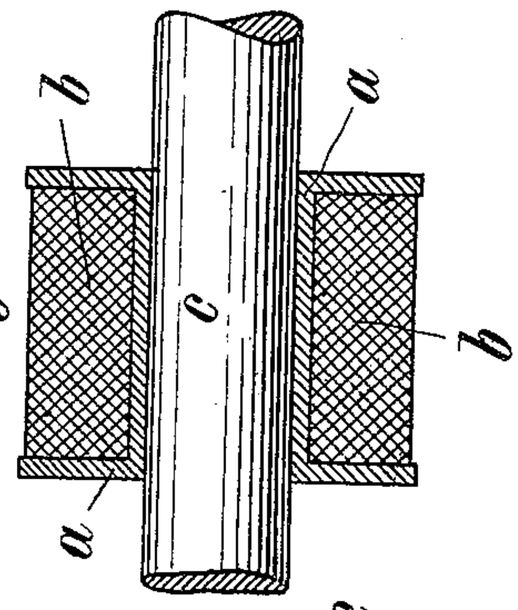

Fig. 4.

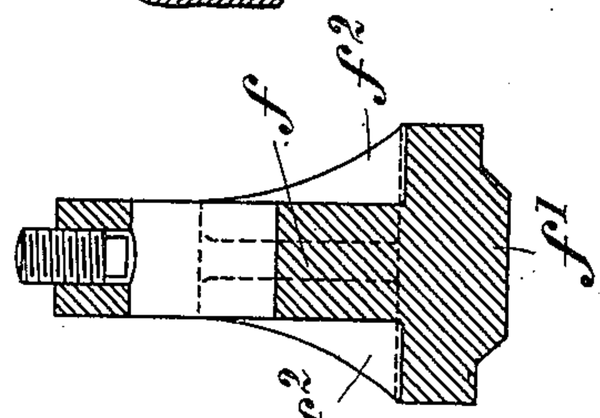

Fig. 3.

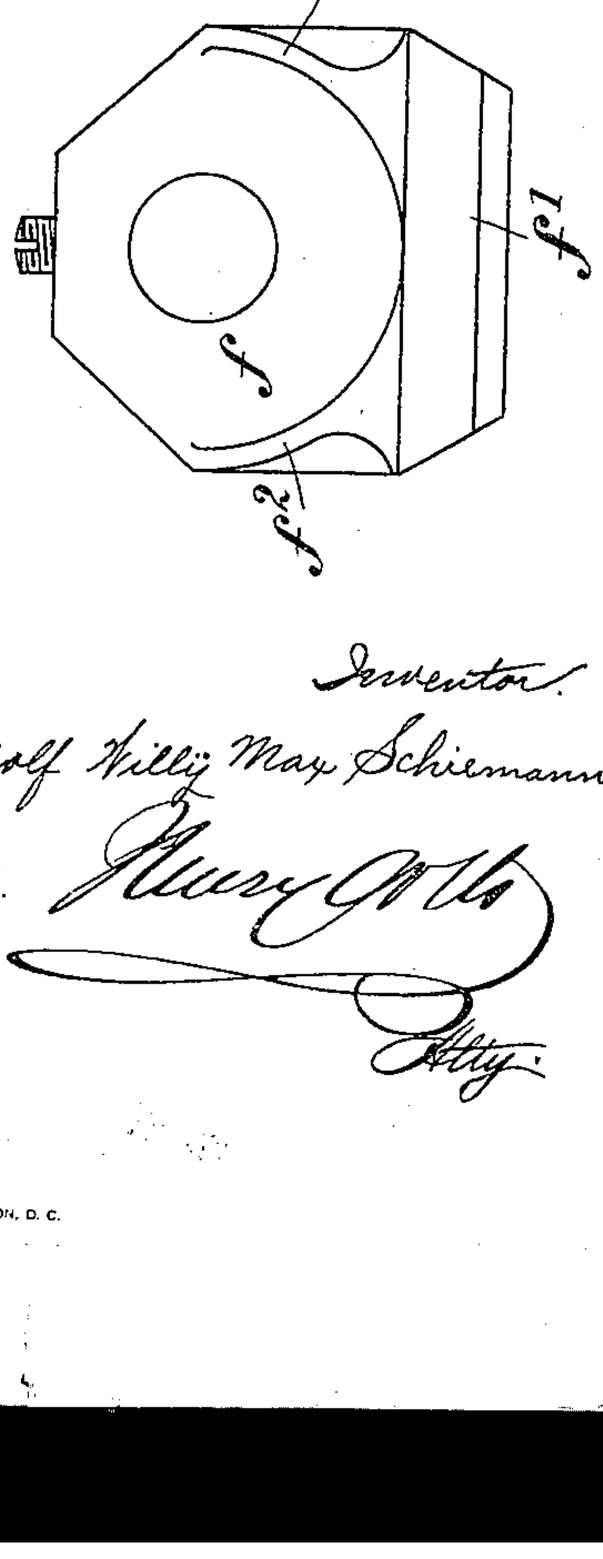

Fig. 2.

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RUDOLF WILLŸ MAX SCHIEMANN, OF DRESDEN, GERMANY.

ELECTRIC RAIL-BRAKE.

SPECIFICATION forming part of Letters Patent No. 663,519, dated December 11, 1900.

Application filed May 22, 1899. Serial No. 717,786. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF WILLŸ MAX SCHIEMANN, a subject of the King of Prussia, German Emperor, and a resident of Dresden, in the Kingdom of Saxony and German Empire, have invented certain new and useful Improvements in Electric Rail-Brakes, of which the following is a specification.

My invention relates to improvements in electric rail-brakes for railway-cars and in electromagnets therefor. These improvements particularly relate to the construction of the electromagnet described in the specification forming part of my prior Letters Patent No. 617,838, dated January 17, 1899, and in the arrangement of the same with relation to the electric-motor car or its wheels, respectively, and will be more particularly described hereinafter with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a railway-car frame equipped with my improved multipolar electromagnet. Figs. 2 and 3 are detailed views of the brake-shoes. Fig. 4 is a detailed view of a bobbin or spool as fitted to the core of my improved multipolar electromagnet. Fig. 5 is a cross-sectional view taken on the line 5 5, Fig. 1, showing the means of supporting the brakes.

Similar letters refer to similar parts throughout the several views.

In contradistinction to the arrangement disclosed by my former Letters Patent, where I have shown each reel-shaped piece or spool integral with its corresponding pole-shoe or pole-shoes, I now prefer to have the spools *a* and the pole or brake shoes *f* made of separate pieces and to arrange and mount these spools *a* with wire coils *b* and the brake-shoes *f* alternately upon the connecting spindle or core *c*, passing for this purpose through suitable holes or openings of the said pieces forming the constituent parts of the electromagnet. This separation of the brake-shoes from the spools for the wire coils affords the great advantage that these separate brake-shoes when injured or broken in case of accident can easily and readily be replaced by new ones without the necessity of also replacing the adjoining spools or reel members with their wire coils, as would be the case in the electromagnet of my former construction.

In order to augment the lines of force of the pole or brake shoes *f* and to increase the strength of the latter, the base-plate *f'* may receive a suitable bulb-shaped form, and at the side faces curved ribs f^2 may be provided, into which fit the wire-coil spools *a*, so that the latter and the wire coils, respectively, are partly embraced by the brake-shoes *f*, and are thus far better protected against external influences than heretofore. These brake-shoes are preferably made of soft iron by casting or pressing and may have their bottom edges conveniently sloped or inclined.

In contact with the outer flange of each of the end spools of the electromagnet is secured an enlarged shoe *d'*, having segmental faces proximate to the wheels, between which on each side of the car such electromagnet is arranged. These outer shoes may be provided within the segmental faces with antifriction-rollers *e'*, or instead of these enlarged end shoes with segmental faces the ordinary brake-shoe *f* at the end of the electromagnet may be combined with a fork-shaped bearing *d*, carrying an antifriction-roller *e* in close proximity to the periphery of the car-wheels. Against these end shoes or rollers will strike the car-wheels when the electromagnets are set in action for braking the car, and they will thus take up the horizontal pull or thrust of the car engendered by the braking of the latter.

In order to obtain a reliable and more adjustable braking action, it is advisable to arrange electromagnets of the herein-described type not only between the car-wheels, but also at both ends of the car—that is to say, in front and at the rear of the car-wheels, as may be perceived from the drawings. The additional front and rear electromagnets, which may have a less number of wire-coil spools and brake, serve as auxiliary or temporary brakes in case of accident. The operation of the auxiliary electromagnets may be effected in a similar manner to that of the main electromagnet either by turning the brake-cylinder of the controller a step farther on or by closing the circuit otherwise. On a

sudden or instantaneous braking the auxiliary electromagnets in consequence of their sucking braking force prevent the car from being tilted up at the ends and from being derailed.

The auxiliary electromagnets, especially when sucked down to the rails by the magnetic force, prevent any large object from passing thereunder and therefore from being run over by the car-wheels. When not in action or sucked down to the rails they are capable of passing over smaller objects, which would not obstruct the progress of the car while being run over. The auxiliary electromagnets form, therefore, at the same time a reliable safety or fender device. The outer shoes d' of the auxiliary electromagnets may be suitably curved or may be provided with any appropriate safety means or fenders serving the purpose. In some cases I may, however, entirely dispense with the electromagnets between the car-wheels and only employ electromagnets of the described type in front and at the rear of the car-wheels without departing from the gist of the present invention.

I am accustomed to attach the electromagnets between the car-wheels, as well as in front or at the rear of the same, by means of links h, connected to rods g, which latter are mounted in bearings g^2, secured on the girder A, forming part of the car-frame. These rods g are provided with abutments g^3, and between said abutments and the top of the bearings g^2 are interposed spiral suspension-springs g'. These springs are of a strength or force somewhat superior to that of the weight of the brakes, so as to counterbalance the weight of the brakes and to secure a yielding suspension or support of sufficient force to hold the brakes when not in use in their upper position and out of contact with the rails. A relatively small magnetic force will be sufficient to overcome the power of the suspension-springs and press the brakes against or upon the rails.

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

1. A multipolar electromagnet comprising a conductive core, conductive spools carrying the wire coils threaded on said core, said coils wound and interconnected to form a multipolar electromagnet with alternating positive and negative poles, and brake-shoes secured to the core between the flanges of said spools, substantially as and for the purpose set forth.

2. A multipolar electromagnet comprising a conductive core, conductive spools carrying the wire coils threaded on said core, said coils wound and interconnected to form a multipolar electromagnet with alternating positive and negative poles, brake-shoes secured to the core between the flanges of said spools and partly surrounding the latter, in combination with outer brake-shoes secured to and partly surrounding the end spools of the electromagnet, said outer brake-shoes having segmental faces and being provided with antifriction-rollers, substantially as and for the purpose set forth.

3. A multipolar electromagnet comprising a conductive core, energizing-spools on said core interconnected to form a multipolar magnet, brake-shoes between the spools and shoes provided with antifriction-rollers arranged to engage the wheels of a car, substantially as described.

4. A multipolar electromagnet comprising a conductive core, energizing-spools on said core, interconnected to form a multipolar magnet, brake-shoes between the spools, one end shoe provided with a friction-roller arranged to engage a car-wheel, and the other end shoe arranged to act as a fender, substantially as described.

5. A rail-brake, comprising a conductive core, energizing-spools on said core interconnected to form a multipolar magnet, brake-shoes between said spools and a link suspension for the brake.

6. In combination with a car-truck, of an electric wheel and rail brake comprising a conductive core, energizing-spools on said core interconnected to form a multipolar magnet, brake-shoes between the spools, links connected to said brake, rods connected to the links and sliding in bearings mounted on the truck, abutments on said rods and springs interposed between the abutments and bearings, substantially as described.

7. In combination with a car-truck, of an electric wheel and rail brake comprising a conductive core, energizing-spools on said core interconnected to form a multipolar magnet, brake-shoes secured to the core between the spools, flanges on said shoes partly surrounding said spools, links connected to said brake, rods connected to the links and sliding in bearings mounted on the truck, abutments on said rods and springs interposed between the abutments and bearings, substantially as described.

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