

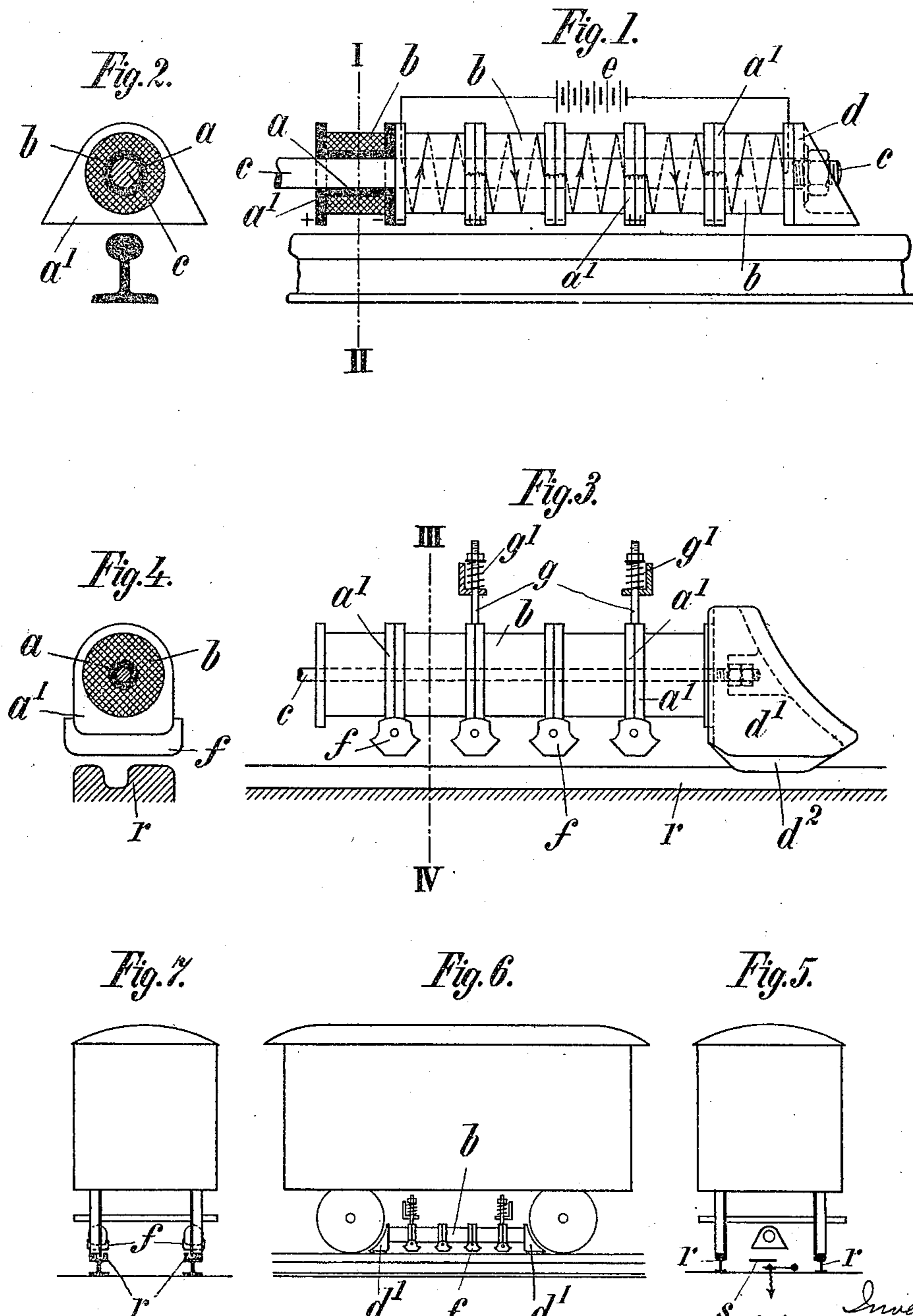
No. 617,838.

Patented Jan. 17, 1899.

M. SCHIEMANN.
ELECTROMAGNET.

(Application filed Dec. 31, 1897.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

MAX SCHIEMANN, OF DRESDEN, GERMANY.

ELECTROMAGNET.

SPECIFICATION forming part of Letters Patent No. 617,838, dated January 17, 1899.

Application filed December 31, 1897. Serial No. 664,987. (No model.)

To all whom it may concern:

Be it known that I, MAX SCHIEMANN, a subject of the German Emperor, and a resident of Dresden, in the German Empire, have invented certain new and useful Improvements in Electromagnets, of which the following is a specification.

My invention has relation to electromagnets adapted for use as circuit-closers on electric railways in which a sectional conductor-rail is used, said electromagnet being also adapted for use as a brake on electric or other street-railways.

The invention has for its object a construction of multipolar electromagnet whereby the number of poles of the latter may be varied at will according to the available space beneath a car when the magnet is used as a circuit-closer or between the wheels on the same side of a car when used as a brake.

That my invention may be fully understood, I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a multipolar electromagnet constructed in accordance with my invention. Fig. 2 is a cross-section on line I II of Fig. 1. Fig. 3 is a fragmentary side elevation illustrating the electromagnet provided with a special form of pole-pieces or shoes. Fig. 4 is a cross-section on line III IV of Fig. 3. Fig. 5 is an end elevation illustrating the arrangement of the electromagnet beneath a car to operate as a circuit-closer; and Figs. 6 and 7 show in side and end elevation, respectively, the arrangement of electromagnets in their use as brakes.

As shown in the drawings, the electromagnet is composed of a core consisting of a rod *c* of a conductive metal, on which are threaded a number of forms or spools *a*, on which the wire *b* is wound. These spools *a* are constructed of a conductive metal, their flanges constituting the pole-pieces or shoes, and the windings of the wire on said spools are such as to form alternate poles, as indicated in Fig. 1. These spools are held together on their core by means of suitable nuts screwed onto the ends of said core *c*, and it is obvious that with this construction a multipolar electromagnet of any desired length can be made.

When constructed as described, the electromagnet can be used as a circuit-closer on electric railways in which a sectional conductor and magnetic switches are employed. It will, however, be readily understood that when a car equipped with such an electromagnet is traveling on a curve said magnet would become inoperative by reason of its displacement relatively to the sectional conductor, so that means would have to be provided to correspondingly displace the electromagnet. One of the objects of this invention is to avoid the necessity of such displacement of the electromagnet, and to this end I construct the flanges *a'* of the spools *a* with a base at right angles to the longitudinal axis of the electromagnet, hence at right angles to the conductor-rails *s*, Figs. 2 and 5, of such a width as to form a sufficiently-extensive magnetic field to influence the magnetic switch or switches along a curve. This is also necessary when the electromagnet is used as a brake, as will be readily understood. When the electromagnet is to be used as a brake, I prefer, however, to secure the brake-shoes to the flanges of the spools, so that they may be removed when worn and others substituted, providing a suitable form of shoe at the opposite ends of the electromagnet.

A brake-shoe *f* of the form shown in Figs. 3 and 4 is secured to the flanges of the intermediate spools, while an enlarged shoe *d'* is secured in contact with the outer flange of each of the end spools, said end shoes *d'* having segmental faces proximate to the wheels, between which, on each side of the car, such an electromagnet is arranged, so that practically the whole of the space between said wheels may be made available and the outer brake-shoes *d'* brought into close proximity to their peripheries.

When grooved rails are used, I increase the brake action by providing the outer brake-shoes *d'* with a rib *d''*, fitting into the groove of the rail, Figs. 3 and 7.

When the electromagnets are used as brakes, they are suspended from the car by rods *g* and springs *g'* in any convenient or well-known manner, and whether said electromagnet or magnets is or are used as a circuit-closer or brakes they should be arranged as close as possible to the conductor or track

rails, as the case may be, as will be readily understood.

The electro magnet or magnets may be energized from any suitable source of electricity, as from a battery *e*, carried on the car, and when used as a brake a suitable switch is of course interposed in the electric circuit.

I am aware that it is not new to construct an electromagnet of a core and a plurality of spools or forms carrying the windings and to so wind and connect the wires as to form a multipolar electromagnet with alternating positive and negative poles, and I do not desire to claim this broadly; but

What I do claim 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, the flanges of said spools constructed with a wide base at right angles to the longitudinal axis of the electromagnet, 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, and shoes *f* secured to the

flanges of said spools with their wide bases at right angles to the longitudinal axis of the electromagnet, for the purpose set forth.

3. The combination with a vehicle, an electromagnetic brake on each side thereof between the wheels consisting of electromagnets composed of a conductive core and a plurality of 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, the flanges of the intermediate spools provided with brake-shoes *f* with their bases at right angles to the longitudinal axis of the electromagnet; in combination with brake-shoes *d'* on the flanges of the end spools provided on their under face with a rib fitting the groove in the track-rail, and a suitable source of electricity connected with the electromagnets, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 14th day of December, 1897.

MAX SCHIEMANN.

Witnesses:

HEINRICH ROBERT LIEBSHER,
HERNANDO DE SOTO.