

No. 738,801.

PATENTED SEPT. 15, 1903.

C. M. HEDMAN.
ELECTROMAGNET.

APPLICATION FILED JAN. 2, 1902.

NO MODEL.

Fig. 1.

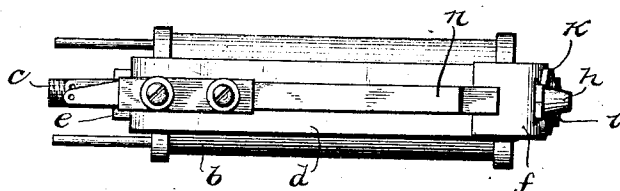


Fig. 2.

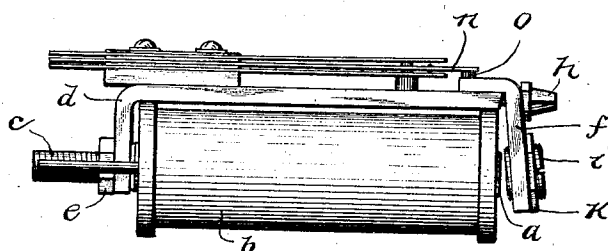
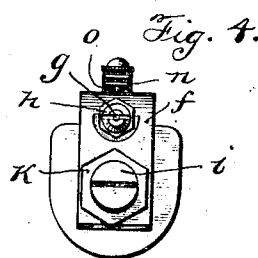
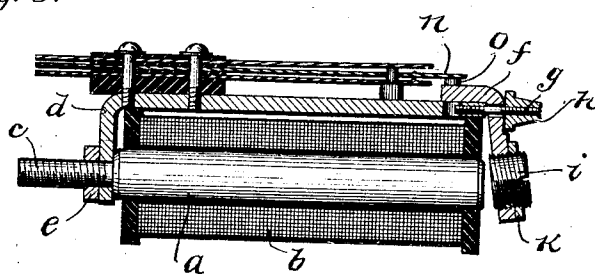


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ELECTROMAGNET.

SPECIFICATION forming part of Letters Patent No. 738,801, dated September 15, 1903.

Application filed January 2, 1902. Serial No. 88,223. (No model.)

To all whom it may concern:

Be it known that I, CARL M. HEDMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electromagnets, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to electromagnets, and has for its object the provision of an electromagnet wherein material of the magnet affording circuit for the magnetic flux may in itself be physically adjusted to decrease or increase the initial reluctance of the magnetic circuit to adapt the electromagnet to varying circuit conditions.

The invention comprises in its preferred embodiment an electromagnet whose armature is formed with relatively movable sections, whereby the proximity of a portion of the armature to the core of the electromagnet may be adjusted without effecting a bodily adjustment of the armature. To this end I prefer to provide the armature in two sections formed of the main body portion that preferably has a swinging mounting and a supplemental portion in the form of a screw that is passed through the main body portion of the armature and which is preferably in direct apposition to the core of the electromagnet. In order that the adjustment of this screw may be secured after once being effected, I prefer to employ a set-nut, which in addition to securing the adjustment of the screw effects a firm engagement between the threads upon the screw and the threads upon the main body portion of the armature, whereby owing to the firm engagement thus effected between the engaging threads of these armature parts the magnetic permeability of the armature is not materially modified.

I will explain my invention more fully by reference to the accompanying drawings, in which—

Figure 1 is a plan view of an electromagnet. Fig. 2 is a side elevation of the magnet illustrated in Fig. 1. Fig. 3 is a longitudinal sec-

tional elevation of the magnet; and Fig. 4 is an end view thereof, illustrating the arrangement of the armature.

Like parts are indicated by similar characters of reference throughout the different figures.

I have illustrated a type of electromagnet in connection with which my invention is particularly applicable; but I do not wish to be limited to the embodiment illustrated, as many changes may be made without departing from the invention.

The electromagnet illustrated comprises a core portion *a*, about which is placed a helix *b*. The core portion *a* is provided with a threaded extension *c*, over which is slipped the shorter end of the L-shaped piece of iron *d*, which is clamped in place between the contiguous end of the core *a* and the clamping-nut *e*. The forward end of the long side of the L-shaped piece of iron *d* supports a swinging armature *f*, bent into an L shape and having its inner corner resting upon the front edge of the plate *d* to afford a swinging engagement, the armature being prevented from displacement by means of a threaded stem *g* passing through a hole in the armature and engaging a nut *h*, which may be adjusted to secure the armature in proper engagement with the plate *d* and yet permit its rotation. Of the two sections *a* and *f* of the magnetic circuit I make the armature in adjustable sections, for which purpose it is preferably provided with a screw *i*, having threaded engagement with the lower end of the armature, so as to be in alinement with the core. This screw is preferably provided with a slot, whereby it may be moved back and forward in the main armature portion from and toward the core to secure an adjustment of the space between the armature and the core, this adjustment after being obtained being secured by means of a set-nut *k*, which not only secures the adjustment of the screw *i*, but maintains the same in intimate contact with the balance of the armature. The armature is interposed between the set-nut and the core *a*. By thus making the armature in relatively adjustable sections the air-gap between the armature and the core may be ad-

justed very readily, the nut *k* and the screw *z* being very accessible.

The particular form of electromagnet illustrated is one that is designed for the operation of circuit-changing springs *n*, the armature being provided with an insulating-button *o* for engagement with the middle spring *n* and for lifting the said spring when the armature is attracted.

10 It is obvious that changes may be made from the embodiment of my invention herein specifically set forth without departing from the invention, and I do not, therefore, wish to be limited to the precise apparatus herein set forth; but,

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

1. An electromagnet having a core, an armature and a screw of substantially the same diameter as said core passing entirely through the armature and opposed to said core, said screw being adapted for operation while the armature is in place whereby the adjustment of the air-gap between said screw and said core may be readily effected, substantially as described.

2. An electromagnet, having an armature including a screw passing entirely through the armature and adapted for operation while the armature is in place, whereby the adjustment of the air-gap between the armature and the core of the electromagnet may be readily effected, and a set-nut, the armature being interposed between the core of the electromagnet and the set-nut, substantially as described.

3. An electromagnet, having a core, an armature, a screw of substantially the same diameter as said core passing entirely through the armature and opposed to said core, said screw being adapted for operation while the armature is in place whereby the adjustment of the air-gap between said screw and said core may be readily effected, and a set-nut mounted upon said screw, substantially as described.

In witness whereof I hereunto subscribe my name this 23d day of December, A. D. 1901.

CARL M. HEDMAN.

Witnesses:

JOHN STAHR,
HARVEY L. HANSON.