

No. 649,031.

Patented May 8, 1900.

S. M. YOUNG.
ELECTROMAGNET.

(Application filed Jan. 7, 1892. Renewed Jan. 10, 1894.)

(No Model.)

Fig. 1.

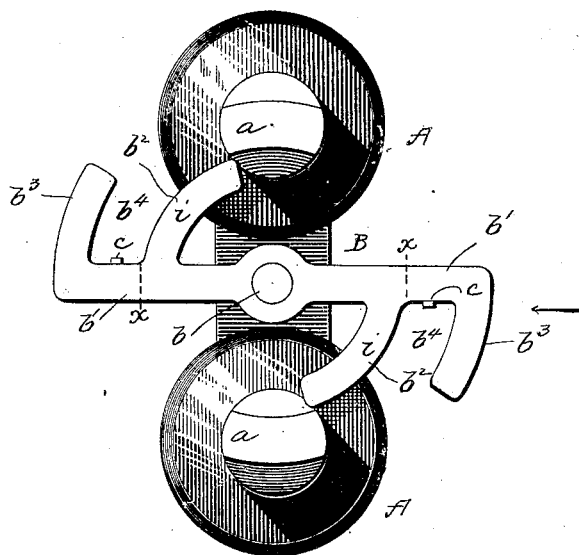


Fig. 2.

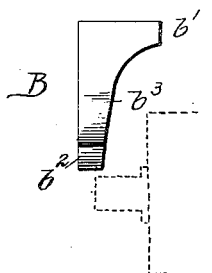
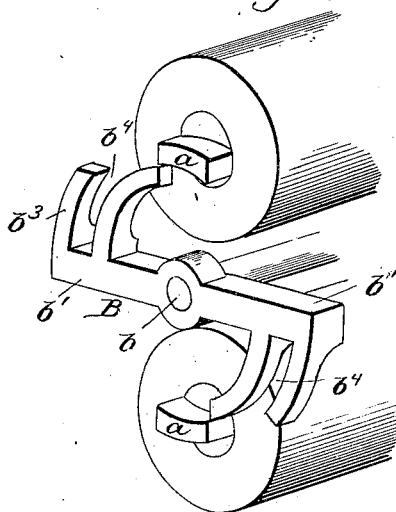


Fig. 3.



WITNESSES:

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ELECTROMAGNET.

SPECIFICATION forming part of Letters Patent No. 649,031, dated May 8, 1900.

Application filed January 7, 1892. Renewed January 10, 1894. Serial No. 496,437. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. YOUNG, a citizen of the United States, residing in New York, county of New York, and State of New York, have invented certain new and useful Improvements in Electromagnets, of which the following is a specification.

My invention relates to electromagnets, and has special reference to the provision of an electromagnet to be used as a motor for railway-signals.

The object of the invention is to provide a magnet having a rotatable armature of high efficiency and especially adapted for the work of operating a light signal.

It consists of the construction hereinafter set forth.

In the drawings forming part of this specification, and in which like letters designate corresponding parts, Figure 1 is an end elevation of an electromagnet embodying one form of my invention. Fig. 2 is a fragmental side view, and Fig. 3 is a perspective view, of part of the device.

The coils A A of the magnet are provided with prolonged poles *aa*, generally curved or arc-shaped, as shown. Pivoted between the poles *aa* on the shaft *b* is an armature bar or piece B, carrying the armature pole-pieces. These pole-pieces are arranged to swing each into the field of its corresponding magnet-pole, and each comprises pieces or elements arranged to come one after the other into the magnetic field, and the metal of a pole-piece of the armature and the metal of a pole of the magnet are arranged to overlap, so that one intrenches or embraces the other. Moreover, the pole-pieces of the armature are so arranged that there is an abrupt increase in their mass at those parts coming latterly into the magnetic field. These features separately and together serve to increase the attractive power of the magnet and to prevent or reduce undue rebound of the armature after it reaches its limit of movement into the magnetic field. In the embodiment of the invention shown in the drawings each pole-piece of the armature comprises pieces or elements *b'*, *b²*, and *b³*. The elements *b²* and *b³* are curved or arc-shaped and arranged when attracted to embrace a pole of the magnet be-

tween them in the spaces *b⁴*. The pieces *b³* are longer than the pieces *b²*, and their ends are close to the magnet-poles when the armature is in unattracted position. The pieces *b'* come last into the magnetic field and provide, as do pieces *b³*, abrupt increases in the mass of the pole-pieces of the armature, which adds to the holding power of the magnet-coils.

In employing the magnet as a signal-motor the magnet is generally fixed so that the armature moves in substantially a vertical plane and the armature carries or actuates the signal-disk or semaphore. The weight of the signal-disk or semaphore is such that when the magnet is deenergized this weight holds the armature in its unattracted position; but this weight is generally suitably counterbalanced, so that the work of the magnet in attracting the armature may be lessened.

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

1. An electromagnet comprising a pair of coils having prolonged poles arranged to be simultaneously magnetized, and an armature consisting of a medially-pivoted bar having its movement in a plane at right angles to the axes of the magnets and provided with curved pole-pieces adapted to be simultaneously attracted each into the field of a different magnet-pole, a pole of the armature and a pole of the magnet so overlapping that one embraces or intrenches the other when the armature is attracted, each pole of the armature comprising two or more pieces or elements curved in opposite directions from said bar and so disposed as to come one after another into the field of its magnet-pole.

2. An electromagnet comprising a pair of coils having prolonged poles arranged to be simultaneously magnetized, and an armature consisting of a medially-pivoted bar mounted on an axis parallel with the magnet-coils having its movement in a plane at right angles to the axes of the magnets and provided with curved pole-pieces adapted to be simultaneously attracted each into the field of a different magnet-pole, a pole of the armature and a pole of the magnet so overlapping that one embraces or intrenches the other when the armature is attracted, each pole of the arma-

ture comprising two or more pieces or elements curved in opposite directions from said bar and so disposed as to come one after another into the field of its magnet-pole, substantially as set forth.

5 3. An electric motor for railway signaling comprising a pair of coils having prolonged pole-pieces and arranged to be simultaneously magnetized, the armature consisting of
10 a bar or piece medially pivoted on a substantially-horizontal axis and having its movement in a plane at right angles to the axes of the magnets and provided with arc-shaped pole-pieces adapted to be simultaneously attracted each into the field of a different magnet-pole, each of the poles of the armature
15 comprising two or more pieces or elements adapted to come one after the other into its magnetic field, substantially as set forth.

20 4. In an electromagnet, the combination of the pair of poles of the magnet and an armature comprising a pivoted piece provided with pole-pieces curved oppositely and on lines substantially concentric with the axis of the
25 pivoted piece, each pole-piece comprising two or more pieces or elements adapted to swing

in the field of force and to embrace a pole of the magnet between them, the armature being provided with a substantially-abrupt increase in its mass at those portions coming
30 latterly into the field of force of each pole of the magnet, substantially as set forth.

5. In an electromagnet, the combination of the poles of the magnet, and an armature comprising a pivoted piece provided with pole-
35 pieces curved oppositely and on lines substantially concentric with the axis of the pivoted piece, each pole-piece comprising two or more pieces or elements adapted to swing in the field of force and embrace the poles of the
40 magnet, the armature so arranged as to come in contact with the poles of the magnet when it has reached the limit of its movement, substantially as set forth.

In witness whereof I have hereunto signed
45 my name in the presence of two subscribing witnesses.

SAMUEL M. YOUNG.

Witnesses:

FRANK S. OBER,
JAMES F. KAVANAGH.