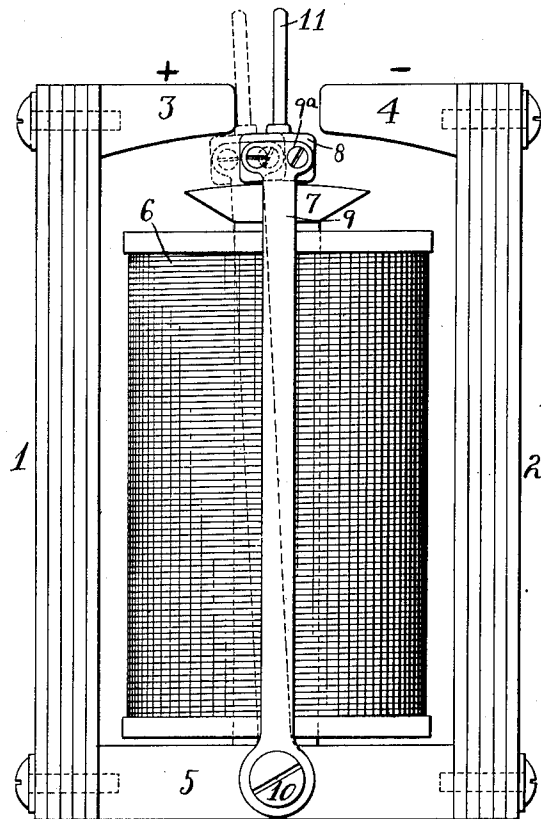


E. A. BURLINGAME.
POLARIZED MAGNET.
APPLICATION FILED MAY 11, 1908.

928,582.

Patented July 20, 1909.



Attest.
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UNITED STATES PATENT OFFICE.

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POLARIZED MAGNET.

No. 928,582.

Specification of Letters Patent.

Patented July 20, 1909.

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To all whom it may concern:

Be it known that I, ELMER A. BURLINGAME, a citizen of the United States, residing at San Francisco, California, have invented certain new and useful Improvements in Polarized Magnets, of which the following is a specification.

My present invention relates to improvements in polarized magnets, and the object of the invention is to provide an electromagnetic device by which a part to be operated may be moved in either direction from a neutral position, according to the direction of the current traversing the magnet coils, and may be moved to distances varying according to the strength of current.

I have aimed to provide an extremely simple form of magnet in which magnetic resistance will be reduced to a minimum and which will operate efficiently and reliably and may be produced at a low cost.

The invention includes the features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

A magnet constructed in accordance with my invention is illustrated in the accompanying drawing in which the figure represents a side elevation of the magnet.

Referring by reference characters to this drawing, I have shown at 1 and 2, two permanent bar magnets, each of which is preferably composed of a plurality of plates as shown. These carry at their upper ends inwardly extending soft iron pole pieces 3 and 4, the one of which should be positive and the other negative as indicated by the plus and minus signs, and are secured at their lower ends to the opposite sides of a soft iron bar or coupling member 5, the connection between the bar magnets 1 and 2 and the pole and base being conveniently effected by means of screws as shown. The pole pieces, bar magnets and base as thus constructed constitute a horse shoe magnet. Mounted on the base piece 5 is a wire wound bobbin 6 having a soft iron core connected with said base and having a soft iron cap 7 at its end.

Above the cap 7 is located an armature 8, which is supported by two arms 9, having their upper ends secured to the armature in any suitable manner as by screws 9^a, and their lower ends pivotally connected to the opposite sides of the base piece 5 in any suitable manner as by screws 10.

I have found that when the width of the armature is a little less than the air gap between the pole pieces 3 and 4, the magnetic action is stronger than if it bears any other ratio. I therefore make the armature of 60 such dimensions and curve its upper surface on the arc of a circle concentric with the axis of the pivot screw 10. Its lower surface is similarly curved as also is the upper surface of the cap piece 7 and the under surfaces of 65 the pole pieces 3 and 4. The distance between the concentric surfaces of the pole pieces 3 and 4 and the cap 7 are such that when the arms 9 are swung to one side as indicated for instance in dotted lines in the 70 figure under the impulse of a current the armature travels between the pole 3 and the cap 7 and with the least amount of clearance consistent with the free motion of the armature, thus reducing the magnetic resistance 75 to a minimum.

In operation, the current flowing in one direction through the coils of the magnet makes the end of the cap 7 for example, negative. Its polarity is assumed also by 80 the armature 8 and the armature is therefore repelled by the negative pole 4 and attracted by the positive pole 3, which results in a movement of the armature 8 toward the pole 3. Similarly, when the cap 7 and armature 8 are magnetized positively, the armature 8 will be moved to the right. I have shown at 11 a member projecting from the armature which will serve as a convenient means of connecting the armature to the part 90 to be operated.

Having thus described my invention what I claim is:—

1. In combination, a permanent horse shoe magnet having suitably shaped poles, a 95 single magnet coil located within said horse shoe magnet and having a suitable soft iron core arranged substantially parallel to the sides of the horse shoe magnet, and an armature movably supported between said core 100 and poles.

2. In combination, a permanent horse shoe magnet having suitably shaped poles, a magnet coil located within said horse shoe magnet and having a suitable core, an armature 105 located between the core, and poles, and arms pivotally connecting said armature with the base of the horse shoe magnet.

3. In combination, a permanent horse shoe magnet having suitably shaped poles, a mag- 110

net coil located within the magnet and having a suitable core, an armature located between the poles and end of the core, arms connected to the said armature at one end
5 and pivotally connected to the base of the magnet at the other end, the under surface of the poles and the upper and lower surfaces of the armature being curved on arcs of circles concentric with the axis of the pivoted
10 arms, and the core having a part in proximity

to the under surfaces of the armature also curved on the arc of a circle concentric with the pivotal axis of the arms.

In testimony whereof, I affix my signature in presence of two witnesses.

ELMER A. BURLINGAME.

Witnesses:

JAMES M. SPEAR,
EDW. L. TOLSON.