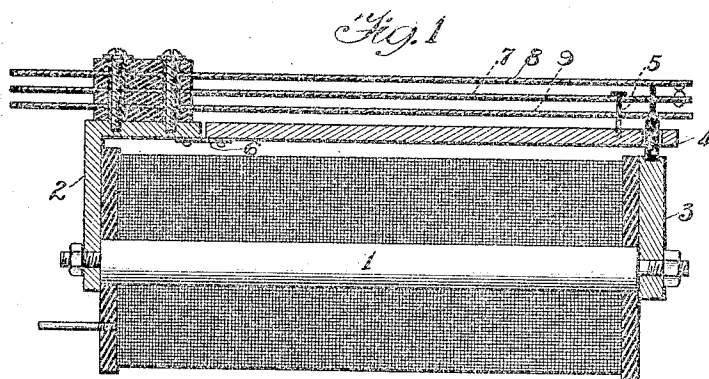
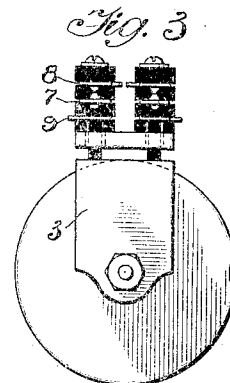
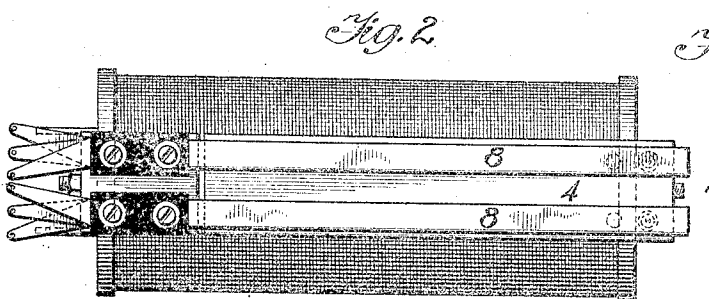
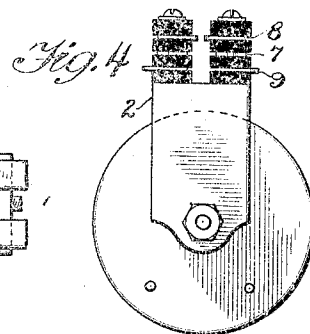
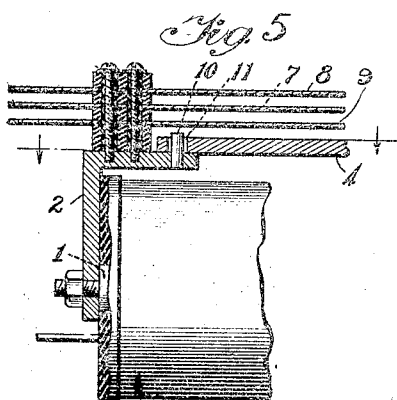
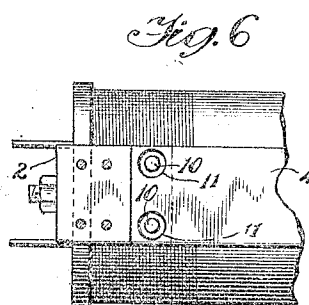


No. 849,443.

PATENTED APR. 9, 1907.

H. G. WEBSTER.
CIRCUIT CHANGING MECHANISM.
APPLICATION FILED JAN. 3, 1905.



Witnesses:
Robert H. Weir
Geo. E. Mueller

Inventor:
Harry G. Webster

UNITED STATES PATENT OFFICE.

HARRY G. WEBSTER, OF CHICAGO, ILLINOIS, ASSIGNOR TO MILO G. KELLOGG, OF CHICAGO, ILLINOIS.

CIRCUIT-CHANGING MECHANISM.

No. 849,443.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed January 3, 1906. Serial No. 339,496.

To all whom it may concern:

Be it known that I, HARRY G. WEBSTER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Circuit-Changing Mechanism, (Case B¹¹.) of which the following is a specification.

My invention relates to relays or electromagnets employing movable armatures controlling switching contacts.

The object of my invention is to secure an improved and efficient form of relay in which the various contacts shall be at all times readily accessible for adjustment and repairs. To that end in the preferred form of my invention I provide the core of the electromagnet with pole-pieces, preferably of soft iron, upon one of which I mount pivotally in magnetic contact an armature which overlaps with one end the other pole-piece in such a manner that it is adapted to be attracted toward the core and pole-piece. I thereby secure upon the magnetization of the core a twofold attractive force upon the armature, one operating from the pole-piece and the other operating from the core itself through the winding of the electromagnet.

I provide a circuit-changing spring in mechanical association with the armature, which in the preferred form of my invention I mount upon the pole-piece with which the armature is in magnetic contact. This spring and the armature extend substantially parallel with the core of the electromagnet, the armature being interposed between the core and the spring.

Other features of my invention will appear in the description of the drawings, in which—

Figure 1 illustrates a sectional elevation of my electromagnet. Fig. 2 is a plan view thereof. Fig. 3 is a front elevation thereof. Fig. 4 is a rear elevation thereof. Fig. 5 illustrates sectionally alternative means for pivotally associating pole-piece and armature. Fig. 6 is a plan view thereof.

Referring to Fig. 1, 1 is the core of the electromagnet, which is surrounded by an energizing-winding. 2 is a pole-piece, preferably of soft iron, mounted upon one end of the core. 4 is the armature, extending parallel with the core, which is pivotally attached

to pole-piece 2 by a flexible strap of magnetic material 6. Armature 4 overlaps pole-piece 3, attached to the other end of the core, leaving a small air-gap which is the only break in the magnetic circuit. Mounted upon pole-piece 2 is a circuit-changing spring 7, extending parallel with armature 4 and mechanically connected thereto by stud 5. In the illustration spring 7 is shown in contact with spring 8 and is adapted upon the attraction of armature 4 to open the said contact and to close contact between springs 7 and 9. Spring 7, it will be readily understood, may be used to affect various circuit changes other than the precise one illustrated. The tension of spring 7 by means of stud 5 may hold armature 4 in the normal position when the electromagnet is not energized.

Referring to Fig. 5, I show an alternate method for pivotally associating armature 4 with pole-piece 2. This consists of pin 10, mounted upon the pole-piece projecting outward and loosely fitting into an orifice 11 in the said armature. In this method of construction armature 4 when attracted turns on the edge of pole-piece 2 as a fulcrum.

Fig. 6 is a plan view of the construction shown sectionally in Fig. 5, 11 and 11 illustrating the orifices in armature 4, and 10 and 10 indicating the pins.

While I have herein shown and described the preferred form of my invention, I do not desire to be limited to the precise construction illustrated, as various modifications would readily suggest themselves to those skilled in the art.

I claim—

1. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of the magnet-core, a substantially straight armature axially mounted on one of said extensions and overlapping the other extension, a substantially flat spring fixed to said former extension and extending in a direction substantially parallel to said armature, said spring being mechanically connected to said armature and flexed so as to draw said armature away from said overlapped projection and magnet-core, and a stop for said spring to maintain a definite normal air-gap between said armature and overlapped projection.

2. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of the magnet-core, an armature and a flat spring secured to one of said extensions and extending in parallel directions toward the other projection, a mechanical connection between said spring and armature near their outer ends, said armature lying between said magnet and spring and overlapping said other projection, and said spring being flexed so as to draw said armature away from said overlapped projection and magnet-core, and a stop for said spring to maintain a definite normal air-gap between said armature and overlapped projection.

3. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of said magnet-core, a substantially straight armature axially mounted on one of said extensions and movable toward said core into engagement with said other extension, a substantially flat spring fixed to said former extension and extending in a direction substantially parallel to said armature, said spring being mechanically connected to said armature and flexed so as to draw said armature away from the said overlapped projection, and a stop for said spring to maintain a definite normal air-gap between said armature and overlapped projection.

4. An electromagnetic circuit-changing device comprising an electromagnet, lateral extensions from the ends of said core, a substantially straight armature axially mounted on one of said extensions and overlapping the other extension, a substantially flat spring fixed to said former extension and extending in a direction substantially parallel to said armature, said spring being mechanically connected to said armature and flexed so as to draw said armature away from said overlapped projection and magnet-core, and a stop for said spring to maintain a definite normal air-gap between said armature and overlapped projection.

5. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of said core, a substantially straight armature axially mounted on one extension and extending along and in close proximity to the magnet-winding, with no magnetic material intervening, to the other extension toward which it is drawn in response to the energization of the magnet, a parallel spring lying adjacent to the outer side of said armature, fixed to the same extension as said armature, mechanically connected thereto near its free end, and flexed so as to draw said armature away from said other extension and the magnet-core, and a stop for said spring to maintain a definite normal air-gap between said armature and said other extension.

6. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of the magnet-core, a substantially straight armature axially mounted on one of said extensions and overlapping the other extension, a substantially flat spring fixed to said former extension and extending in a direction substantially parallel to said armature, said spring being mechanically connected to said armature and flexed so as to draw said armature away from said overlapped projection, and a second flat spring lying substantially parallel to said first-mentioned spring and normally engaging the same to limit the outward movement thereof.

7. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of the magnet-core, a substantially straight armature axially mounted on one of said extensions and overlapping the other extension, a substantially flat spring fixed to said former extension and extending in a direction substantially parallel to said armature, said spring being mechanically connected to said armature and flexed so as to draw said armature away from said overlapped projection and the magnet-core, a second flat spring lying substantially parallel to said first-mentioned spring and pressing inward toward the latter to engage the same to limit its outward movement, and a stop to normally engage said second flat spring to maintain it in a definite position.

8. An electromagnetic circuit-changing device comprising an electromagnet, an extension from each end of the magnet-core, a substantially straight armature axially mounted on one of said extensions and overlapping the other extension, a substantially flat spring fixed to said former extension and extending in a direction substantially parallel to said armature, said spring being mechanically connected to said armature and flexed so as to draw said armature away from said overlapped projection, a second flat spring lying substantially parallel to said first-mentioned spring and pressing inward toward the latter to engage the same to limit its outward movement, and a stop mounted on said overlapped projection and operative to normally engage said second flat spring to maintain it in a definite position.

9. An electromagnetic circuit-changing device comprising an electromagnet-core, an extension from each end of said core, a substantially straight armature axially secured at one end to one of said extensions and overlapping the other extension at its other end, three substantially flat springs fixed to said former extension and extending in a direction substantially parallel to said armature, a mechanical connection between said armature and the center spring, and means for maintaining the other springs apart, said center

spring normally pressing against the outer
spring to maintain a definite air-gap between
said armature and the overlapped projection
but movable into engagement with the inner
5 spring in response to the magnetic pull of the
magnet-core.

In witness whereof I hereunto subscribe

my name this 10th day of December, A. D.
1904.

HARRY G. WEBSTER.

Witnesses:

L. D. KELLOGG,
G. E. MUELLER.