Magnetic levitation.

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The proposed device relates to the field of physics and electrical engineering, namely, to the method of creating an electromagnetic force having a strictly defined action vector.

The proposed scheme is fundamentally different from the previously used constructive schemes, since in them the magnetic field created by the charges of one conductor acts on the electric charges of another conductor, and at the same time a force arises in the second conductor.
The second conductor creates its own magnetic field, which acts on the charges of the first conductor and creates a counteracting force. In this case, the two forces acting and reacting balance each other within the considered system. The proposed design dilutes magnetic fields in such a way that the opposing force does not appear or appears within the considered device, but the principle of the resultant of the force acting and opposing it is not fulfilled. This statement contradicts the well-known law discovered more than three centuries ago. But it should not be considered a comprehensive law that was discovered when ideas about the magnetic field were not even formulated. In addition, the effect of the law for magnetic fields has so far been considered for isolated cases of homogeneous and isotropic media, and has not been considered at all for possible cases of interaction of magnetic fields in inhomogeneous and non-isotropic media. But after all, the proposed design is such a non-isotropic and inhomogeneous medium.

The proposed design consists of two DC electrical circuits. The first electrical circuit includes in the simplest case: a low-voltage power supply as which a unipolar machine generating large currents at low voltages can be used (in other designs, you can abandon the use of a unipolar machine and use DC sources generating small currents); a switch; connecting wires (buses); a rectangular conductor 4, made of a non-magnetic sheet with good conductivity (for example, copper), having insulation, located in the gap of the magnetic circuit of the second electrical circuit. Also, the first electrical circuit has its own magnetic circuit consisting of two small U-shaped magnetic conductors 6 and two vertical spreading magnetic conductors 5. The second electrical circuit in the simplest case includes: a DC power source; a switch; connecting wires; an electromagnetic coil with a winding. The second electrical circuit also has its own magnetic circuit, consisting of a U-shaped magnetic circuit 2 made of a 0.3-0.5 mm thick ferromagnetic material, and two horizontal separating magnetic circuits 5, which are adjacent on both sides to the insulation of a rectangular conductor 4. Between the vertical and horizontal magnetic circuits of two magnetic circuits there are gaps filled with a diamagnet or superdiamagnet isolating the magnetic circuit of one electrical circuit from the magnetic circuit of another electrical circuit.

In Fig. FI shows a schematic diagram of a power electromagnetic device with a configuration of magnetic fields.

In Fig. F2 shows the mechanical part of the device design.

The operation of a power electromagnetic device is carried out as follows: an electric current from a DC source, falling on the coil winding 1 creates a magnetic field. The magnetic field lines of the electromagnetic coil are closed through the U-shaped magnetic core 2, the ferromagnetic pins of the horizontal separating magnetic core 5 and the rectangular conductor 4 on themselves. Insulated rectangular conductor 4, through which a direct current flows Jpr. it is made of diamagnetic material with good conductivity. It is located in the gap between the pins of two horizontal magnetic conductors, which are closely adjacent to its insulation. As a result, an Ampere force occurs in the rectangular conductor 4. There are w turns in the winding of the electromagnet and a current Job flows through them. We believe that there are no gaps between the touching parts of the sections of the U-shaped magnetic circuit, the horizontal separating magnetic circuit and the insulation of the rectangular plate. Consider a generalized magnetic circuit, where sections are highlighted: section 1 (L1 , S1) of the magnetic circuit; section 2 (L2, S2) - magnetic circuit; section 3 (L3, S3) - magnetic circuit (ferromagnetic pins); section 4 (L4, S4) - magnetic circuit, the length of which is equal to the thickness of a rectangular conductor. Let's denote the average values of magnetic induction and magnetic field strength in individual sections of magnetic conductors and in a rectangular conductor, respectively: in section 1 - H1 and B1; in section 2 - H2 and B2; in section 3 - H3 and B3; in section 4 - H4 and B4. We neglect the magnetic fields of scattering, therefore:

B1xS1 = B2xS2 = B3xS3 = B4xS4 = F1

According to the law of the total current for the contour of the middle power line we have:

H1xL1+2H2xL2+2H3xL3+H4xL4 =w x I (windings).

Since H=B/µ;, the equation can be written as:

(B1xL1 + 2B2xL2 + 2B3xL3)x K1/µ1 + B4xL4 /µ2 = w x I win,

where:

µ1 - is the magnetic permeability of the steel material sites

1, 2, 3;

µ2 - are the magnetic permeability of the material at the phase 4;

K1-steel fill factor in the phase 1, 2, 3;

S1 –cross-sectional area of section 1;

S2-cross-sectional area of section 2;

S3-cross-sectional area of section 3;

S4-cross-sectional area of section 4;

B1-magnetic induction in phase 1;

B2-magnetic induction in phase 2;

V3-magnetic induction in phase 3;

B4-magnetic induction in a rectangular conductor;

w - the number of turns of the magnetizing winding;

I win. - the current in the magnetizing winding.

From here you can find the value of the induction acting on a rectangular conductor 1:

$$B4 = (w \times I\ win - (H1xL1 + 2H2xL2 + 2H3xL3) x\ K1) \times \mu 2/L4$$

The ampere force arising in this case in a rectangular conductor will be equal to:

$F = B4 \times I \times L$ where:

F-ampere power in rectangular conductor,

B4 - magnetic induction in a rectangular conductor,

I - the current in a rectangular conductor.

L - is the length of a rectangular conductor in a magnetic field.

A rectangular conductor 4 through which a direct current flows also creates a magnetic field. The vectors of the intensity and induction of this magnetic field will have the form of closed concentric oval shapes relative to the conductor. With the usual design of an electromagnet with a conductor 4 in the gap of the magnetic circuit of the electromagnetic coil, the force that balanced the Ampere force in the conductor 4 arose as a result of the action of the magnetic field of the conductor 4 on the ferromagnetic domains of the magnetic circuit of the electromagnetic coil. At the same time, the magnetic field of the electromagnetic coil 1 was distorted and a counter force arose in it, balancing the Ampere force of the conductor 4. For the above device, the effect of the magnetic field of the rectangular conductor 4 on the domains of the magnetic circuit of the electromagnetic coil is significantly reduced (or even excluded) due to the fact that it is possible to maximally separate the propagation paths of two magnetic fluxes – the magnetic flux of the electromagnetic coil 1 and the magnetic flux of the rectangular conductor 4. This is done by isolating the propagation paths of their magnetic fluxes from each other . If there is still a slight effect on the domains of the magnetic circuit of the electromagnetic coil from the magnetic field of the rectangular conductor 4, then it will be significantly less than in a conventional electromagnet because the magnetic field of the conductor 4 will propagate along the path with lower energy costs, i.e. through the magnetic paths of the vertical magnetic core 5 and the small U-shaped magnetic cores 6 of its magnetic circuit and will not fall into the magnetic circuit of the coil. Therefore, the Ampere force arising in a rectangular conductor 4 from the action of the magnetic field of the electromagnetic coil 1 on it will not be balanced by a force of the same nature, equal in modulus and opposite in direction in the electromagnetic coil from the action of the magnetic field of the conductor 4 on it.

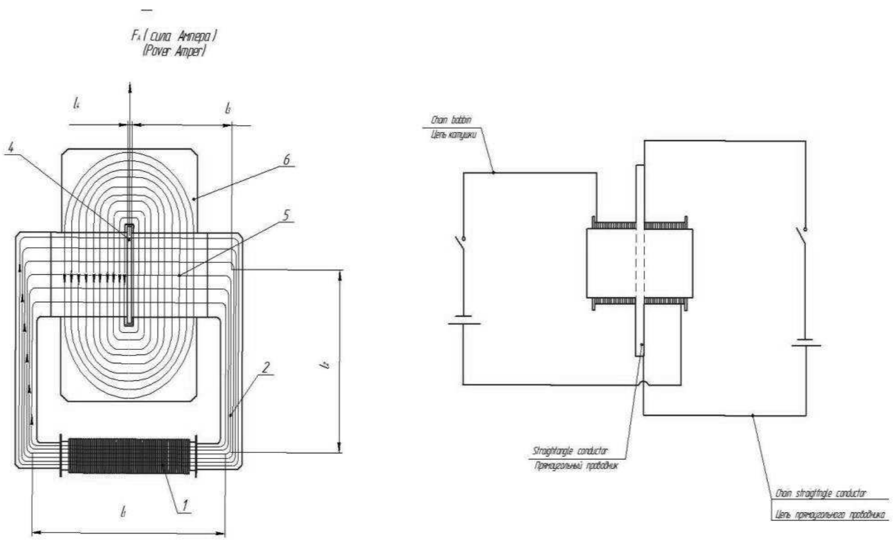

Fig.1 – Schematic diagram of a power electromagnetic device with a configuration of magnetic fields.

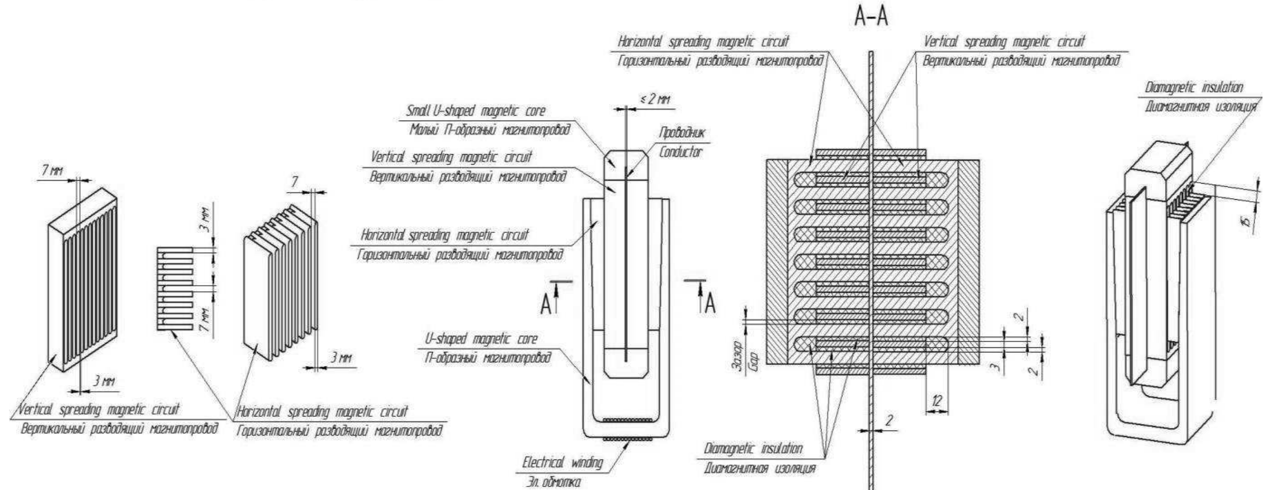

Fig.2 . Mechanical part construction