WHAT IS THE ELECTRICAL CURRENT AND THE THERMAL ENERGY AS ONE OF THEM CAN MOVE TO ANOTHER AND BACK

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In this article on the level of individual atoms behavior showed the spatial, i.e. three-dimensional vision of what the heat and alternating electric current. At this level, first, represented the transition of the alternating electric current into thermal energy. And then showed the reverse process mechanism, i.e., how the electric current arises in the thermocouple.

Keywords: thermal energy, electric current, alternating electrical current, thermocouple

When we turn on an electric stove, through the electric current we get the required quantity of heat energy.

What is the electric current and heat? The academic literature indicates that an electrical current is directed (ordered) movement of the charged particles. In metals, these particles are free electrons. But if someone wants to find how the electric current is converted into heat of the surrounding air from the textbooks, the search will be inconclusive.

The absence of it and many other explanations relate to the fact that the description of thermal energy was based on the molecular-kinetic theory (MKT). The volume of this article cannot give all examples of that are the criticism of MKT. It is quite extensive and it is presented in various works. For example, in [1]. The work was not translated into English. Refusal to MKT allowed to explain not only the nature of the electric current. In reference [2] we can find an explanation how exactly strong interactions may be weak and then become gravity. At the level of the behavior of individual molecules reveal reasons of thermal vertical flows in gases and liquids. There is a fairly simple explanation of what lies behind the term "entropy". More precisely, at the same level of specific atoms and molecules disclose uniform heat distribution mechanism in a closed volume.

The explanations were given only by the help of a discovery.

Prerequisites to select a base position and explanations

In the nineteenth century, many scientists adhered to the caloric theory. According to the theory the heat is a material and elements of caloric repelled from their own kinds and are attracted to other elements of matter. This theory explained a lot, but it was rejected when answers to some questions were not found.

Let us point on main things. One of the questions was that. If caloric is a matter, why when we heat the substance it does not become heavier? The discovery that changed everything and gave clarity on many physical processes is follow. One and a half centuries ago, no one remembered that under the crust of the Earth there is something which is concentrated in a large amount and it gives heat. It consists of the same elements that repel each other and are attracted to the other.

This finding, fundamentally, alters the vision of all that is related to the caloric, a term which is still used today. With this factor is no longer linked caloric idea, as some weightless liquid. So I depart from the old name, and began to use the term "element of a thermal energy component" (ETEC). And I called my theory (concept) "theory of thermal energy" (TTE). This discovery gave us easy explanation and not only the vertical heat flows in gases and liquids, but also weight change of solids.

So, if ETEC is attracted to all elements of matter, their numbers are easily explained by the transition of a substance from one state to another. The solids present so many ETEC that the force of attraction of atoms to each other exceeds the action of repulsive forces, which gives rise to the same presence of ETEC. With strong heating the substance in its composition is entered such amount of ETEC, plaster components of the atom, significantly alienate the electrons from the nucleus. At the same time weakened the force of attraction of an atom to atom. Further their melting point that bond strength between them weakened to such an extent that they will not withstand the action of gravity. This is what characterized the liquid. Therefore, in the gas state atoms and molecules reside when the repulsive forces between them exceed the force of attraction.

In given links there are great detailed profs that the results of the well-known experiments of Rumford, Humphry Davy, Stern and many others, have other and more clear interpretations. All these experiments were carried out with different environments, but one scenario. Body and even liquid were treated friction, and thus allocated a certain amount of heat.

Since these tests are considered to be proof of MKT correctness. But it's not just experiments should be attributed to the evidence, but rather tied to a clear explanation of the theory. Is there a description of how the drill speed or ice pieces increase the speed of atoms in their structures? Is there, unless, a detailed explanation of how the same action in these bodies increase the amplitude of the vibrations of the atoms? If not, then there is no explanation for the binding to the MKT. That is why a common phrase that the experiences are proof of the MKT correctness should be classified as unfounded declarations. Furthermore, my work [3] provides the evidence that the gas temperature cannot be related to the speed of movement of its molecules in space. In that heat release is important for an explanation that is given below, now let examine all of this with reference to the TTE.

In my work, heat release in gas compression is explained in sufficient detail. Here, I briefly point out that the heat release from the solid and liquid bodies occurs as a result of deformation of atoms and molecules. This is nothing new and it is implied in the caloric theory.

The question is stored in other aspect. Where does the excess heat from? if experience with drilling weighing showed that the mass of a rest body with the chips remained unchanged. Firstly, the weighing was not produced during the heat release process, which is very important. The importance of this point the results of experiments, which are described in [4, 5, 6 and 7]. They show when the body is heated, the fluid and gases reduce their weight. Upon cooling, the process is reversed. And when the temperature is reduced, the former weight is also reduced.

Clarification of the excess heat is explained as follows. The fact that the process of heat release (ETEC) from the shear zone occurs under the action of a tool, such as drill bit.

This means that it occurs at a rate of movement of the working surface of the drill. This is a very important factor. It points out that in all these compression experiments or simple distortion of the structure is produced with a relatively low speed. Now, it should be clarified – in relation to what. The processes of elastic recovery structure, even if incomplete, happen in a natural way. This action may be compared with the next visual effect. Pressing, for example, a small rubber ball by a middle finger and begin to move it so that in the end the ball was pressed against the very tip of the finger. Next comes a point when the ball pops up sharply from the thumb. This occurs under the action of internal forces of its elastic structure. A similar effect occurs with mechanical compression molecules of different substances materials. This means that the elements of heat that are returned to the weakened zone pressure, do it with their natural speed, i.e. a speed which is close to the speed of light. Such heat transfer refers to the radiation.

Sharp (high-speed) return of ETEC in each atom that is exempt from the pressure, despite the fact that their further spread in all directions at a rate of a conventional heat transfer and convection lead to a local accumulation in the friction zone.

At this point the brief introduction to the essence of thermal energy by TTE finishes and moves to the explanation of what the alternating electric current. The main objective of this article to show the principle of how an electric current is converted into heat. Since modern physics connects the electric current in metals with the motion of free electrons, the explanation will be built on this foundation.

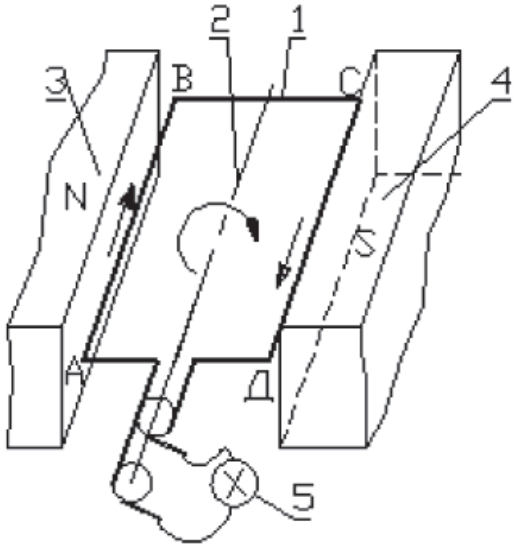

Fig. 1

So, the academic literature informs that in the electron shells of metal atoms are always one, two or three electrons that are very weakly bound to the nucleus. Such electrons are free. It follows that, under certain circumstances, the electrons are loosely attached to the atoms, can leave their seats and move to some distance from its atom. Logically this is possible if the substance has a structure of interconnected voids. By this factor issues should not be, when you consider that the atoms together in complex structures of molecules, should create any voids. Under what conditions, the electromotive force (EMF) occur in the conductor, it is described widely. Therefore, further explanation we can build on the fact that is simply there is. Explanation will build on a simple

alternating electrical current generator, which (Fig. 1–3) consists of the rotary frame 1 around the axis 2 between the two poles of the magnets 3 and 4. Both ends of the frame by means of a system of slip rings and brushes through wires connected to the lamp 5.

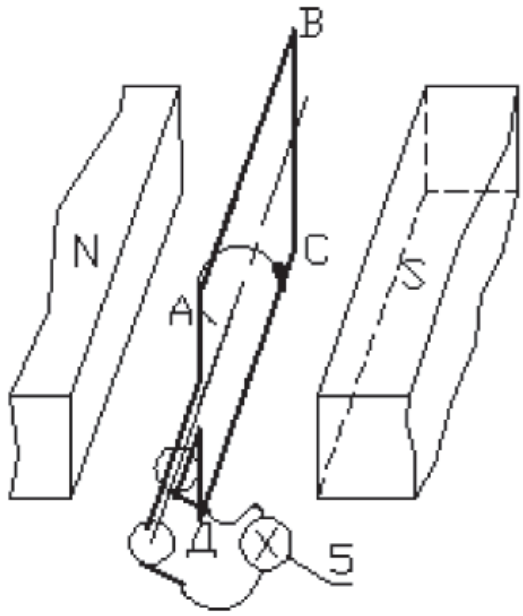

Fig. 2

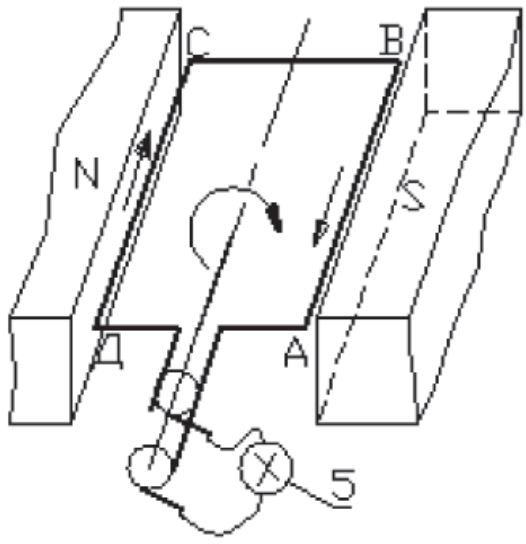

Fig. 3

Occurrence of EMF frames stretch by time in the conductors, i.e. it does not happen simultaneously. First, from the neutral position to a position when the active portions of the frames (i.e. a EMF induced) aligned with the central portion of the magnet pole (Fig. 1 and 3), there is a build-up of forces on the electrons. The arrows indicate the direction of motion of the electrons. During this time, the electrons under the influence of external forces are forced to move in that direction. For example, from *A* to *B* and from *C* to *D* (Fig. 1). Naturally, part of ETEC that belongs to them, moves together with them. Deeper understanding of how the electrons are confined by TTE in orbital atom may be prepared from materials [1]. During the displacement of the electrons in the same advancement of ETEC direction as the electrons themselves may also occur when other substitution. That is one faced by other, remaining in place of those which have faced. But these are details. Under these circumstances, it is clear that a greater resistance to the movement of electrons obtained when the conductor, for example in the form of a spiral section decrease bulb. Electrons in all circumstances have to move on. Their surroundings of ETEC in cramped conditions can no longer in the same number follow electrons. Some of them are pressed on the surface of the conductor and then go to the surrounding atmosphere.

After passing the central part of the pole, electrons have consistent attenuation in pressing strength on them. Under these conditions, their advance in the same direction become slow. Now we spend the analogy. Exposure to electromagnetic field on the electrons and force them to move forward in spite of their resistance, we thereby subjecting it and all its surrounding to compression. The process of compression is carried out at a rate that is adequate to the speed of the conductor frame portion, which EMF is induced. This compression process is comparable to what we discussed above in the process of mechanical friction. The same comparisons we can make with pressure ease process. Therefore, data comparing indicate that in the period of the weakening of the power of action on the electrons, from the outside they can recover their environment from ETEC at a speed close to the light. After passing the neutral position (Fig. 2) everything is repeated, only this time the electrons are moved in the opposite direction (Fig. 3). After passing the neutral position (Fig. 2) everything is repeated, only this time the electrons are moved in the opposite direction (Fig. 3).

If all this is so, it turns out that electrons are used as a kind of pump. With the use of the electromagnetic force the generator pumping in ETEC conductor, which are not subject to their action. This reductive ETEC flow from the outside to a spiral light bulb do not have to be exactly on its length. If the ETEC sampling in spiral bulb is hindered by its vacuum environment ,moving at a speed close to the light, a certain part can be supplied by conductors.

The foregoing occurs during a locked circuit. If the electrical circuit is not locked, the electrons are moved periodically in a dead-end branch or the other. The thicker and longer the dead end of the conductor, in which the seal of electrons take place, than less dense their concentration in it. But since there is still a certain compression and reducing the impact on the electrons, and the heat release occurs appropriate.

Briefly on the thermocouple

The conductors of different materials have different composition of atoms, different density, it means, communicating cavities of different sections. If there is a temperature gradient flow from ETEC through such conductors, seize and carry away some of the electrons with them differently. That is, in the reverse thermocouples process from the above described.

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