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New Energy Technologies

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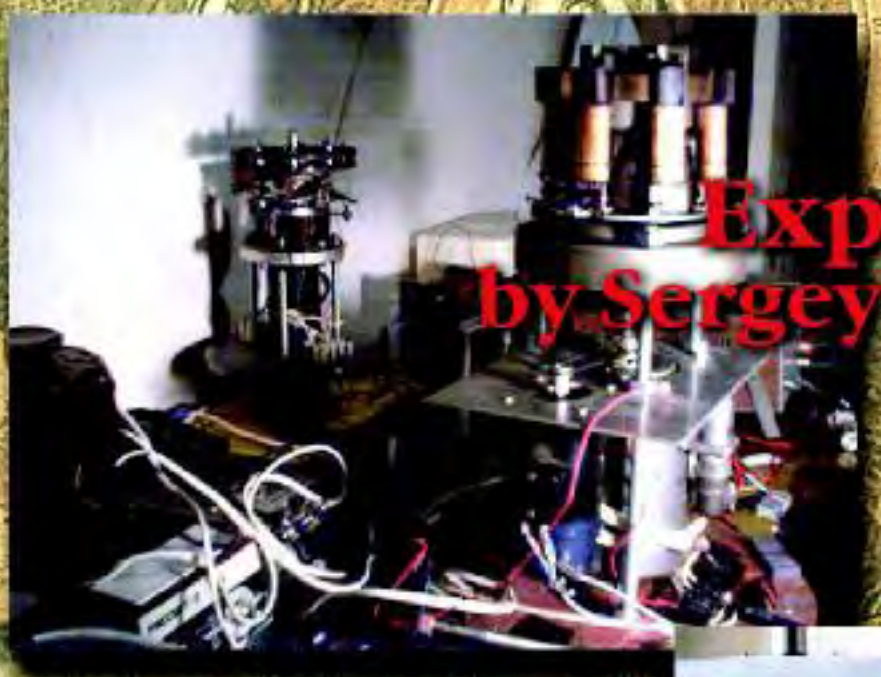


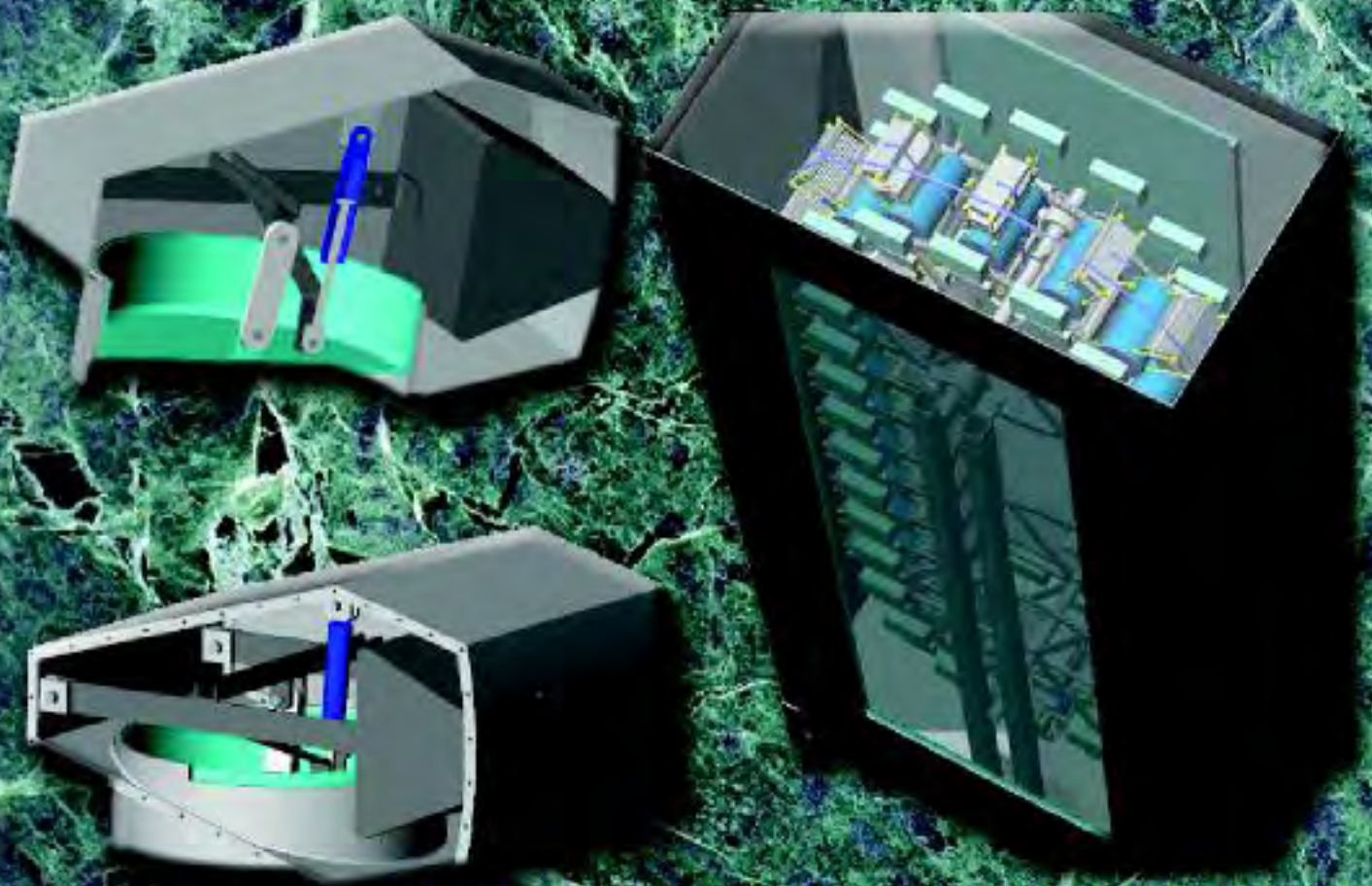
Experiments by Sergey N. Shmidt, Russia

Also in this issue:

- *New experiments on magnetic motors*
- *Controlled thermonuclear fusion*
- *Electro-field power engineering and mechanics*

Perpetual motor
with magnetic control elements

Inventor: M. Smeretchanski



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News from France

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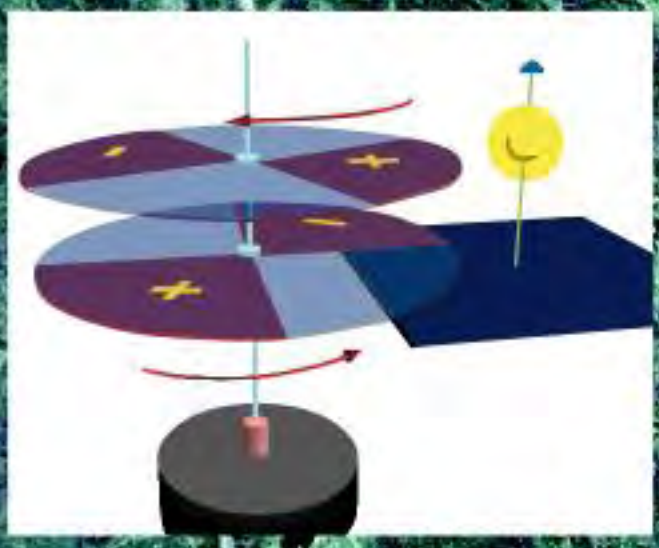
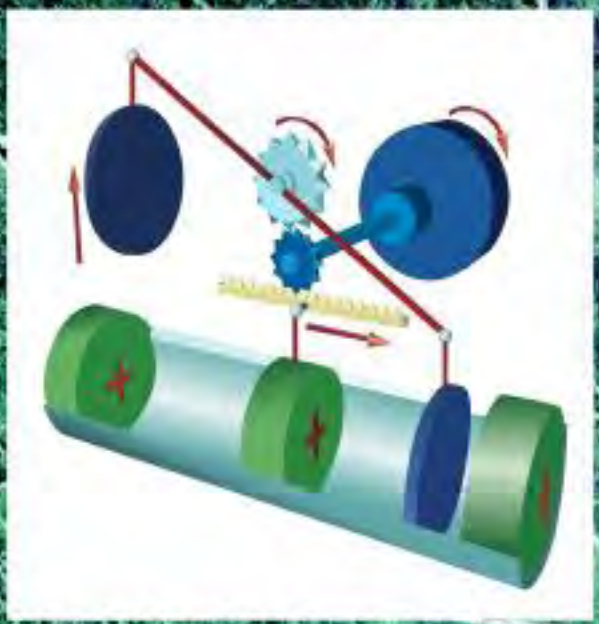
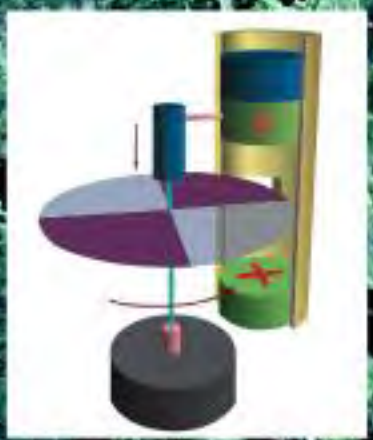
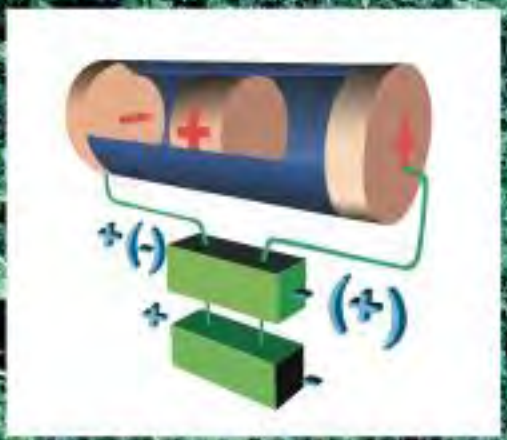
Electro-field motors

Author: Valeri D. Dudyshev









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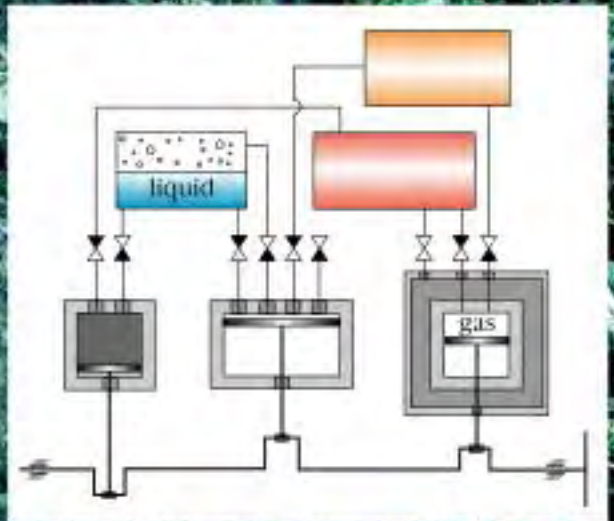
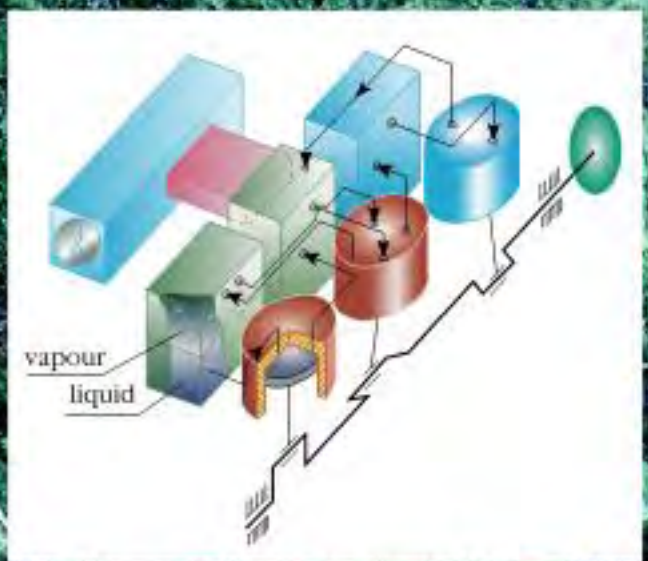
Heat engine

Author: Samuil N. Doonaevsky





Interference Generator

Inventor: Alan I Francoeur
http://www.fortunecity.com

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NEW ENERGY TECHNOLOGIES #13

Single-Wire And Wireless Electric Power Transmission

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Single-Wire Electric Power Transmission

The idea of single-wire electric power transmission has become especially attractive to many researchers after a demonstration of single-wire AC transmission made by S.V. Avramenko [1] at the Moscow Scientific-Research Institute of Electrical Engineering. *Editor's: We have already written about similar investigations in our previous issues. The story began more than 100 years ago with Tesla's experiments.*

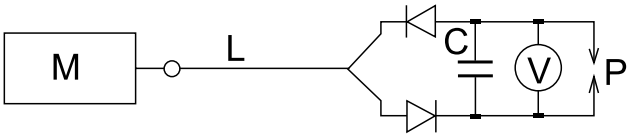

Fig. 1

Single-wire power transmission circuit by Avramenko[1]

At the heart of the device there is "Avramenko plug" representing two sequence semiconductor diodes (Fig.1). If the plug is connected to a wire under AC voltage, then after a time in a discharger **P** there is observed a run of sparks. The time gap from connection to discharging depends on the values of capacity (**C**), voltage, frequency of pulsation and the size of the air gap (**P**). The connection of a resistor (**L**) of 2~5 MOhm to the transmission line does not cause any considerable changes in operation of the circuit [1]. In the article [2] the authors assume that the efficiency of the device depends on the material which is used for the windings of a generator (**M**). Therefore they believe it is necessary to check expediency of using nickel, iron, lead, etc. wires to make the windings. At the same time, one of the authors of the article [2] considers their line to be superconducting [3, 4].

Our Experiments on Single-Wire Electric Power Transmission

The authors of this article carried out a number of experiments on power transmission using single-wire lines. To that end we developed a new single-wire power transmission circuit. In our circuit there was no "Avramenko plug". Instead of an "Avramenko plug" we used an ordinary bridge circuit. In our experiments the bridge circuit turned out to be much more efficient than "Avramenko plug". Moreover, we made some other changes into Abramenko's circuit. Our circuit is presented in Fig.2. The transmitting unit consists of a generator and a transformer. The circuit diagram of the transmitting unit is shown in Fig.2 (to the right of the transformer).

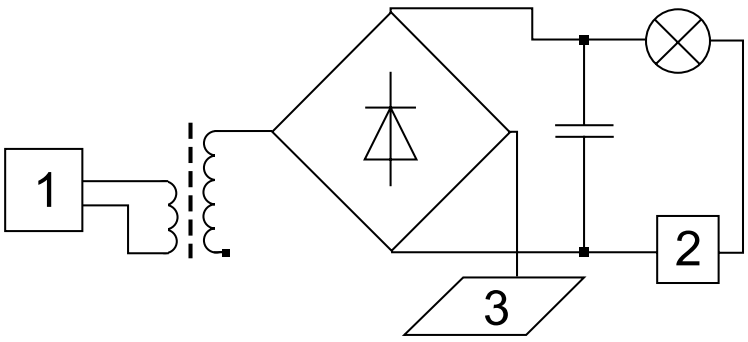

Fig. 2

Single-wire power transmission by a new circuit

Figures in the circuit diagram (Fig.2) denote the following: 1 – Generator, 2 – Extender of spectrum, 3 – "Antenna". The general view of the device is shown in Fig.3.

Fig. 3

General view of the device to demonstrate single-wire power transmission

Electric energy is supplied to the device from a DC power source B5-47 providing voltage of 0-30 V. An incandescent lamp of 220 V, 25Wt serves as load. The generator and transformer are enclosed into a dielectric casing. The components of a power receiver (diodes, capacitor, lamp, elements 2 and 3) are placed in a plastic casing under the lamp (Fig.3). The power receiver is connected to the transformer with one wire.

The intensity of glow of the lamp depends on the generator power. The lamp of 220 V, 25Wt is almost fully incandesced when high output voltage of the power supply is within the range of 16~ 18 V (Fig.4).

Fig. 4

Glow of the lamp at high voltage of power supply B5-47 in the single-wire power transmission line

The key points in increasing the efficiency of our circuit in comparison with Avramenko's circuit are that we used an entire standard bridge circuit and not just a half of it. Besides there was used a spectrum expander. The load does not impede full charging of the capacitor since the spectrum expander was used in the circuit. Neither connection of a resistor to the transmission line nor using a conductor of high specific resistance as a transmission line can considerably affect the degree of glow of the lamp. Our circuit of single-wire power transmission has two independent lines with different frequency spectra. The first line has a narrow-band frequency spectrum and the second line – a wideband one. In the first line the circuit closes at the free end of the secondary winding of the transformer through an antenna (3) (Fig.2). The capacitor, spectrum expander and incandescent lamp form the second line.

Experiments with Burnt-Out Incandescent Lamps

Both good and burnt-out lamps glow in the above-described experiments on single-wire power transmission. Results of the experiments with the burnt-out lamps are presented below.

There is a break of a filament of the incandescent lamp (Fig. 5). This photo was taken while the device was switched off.

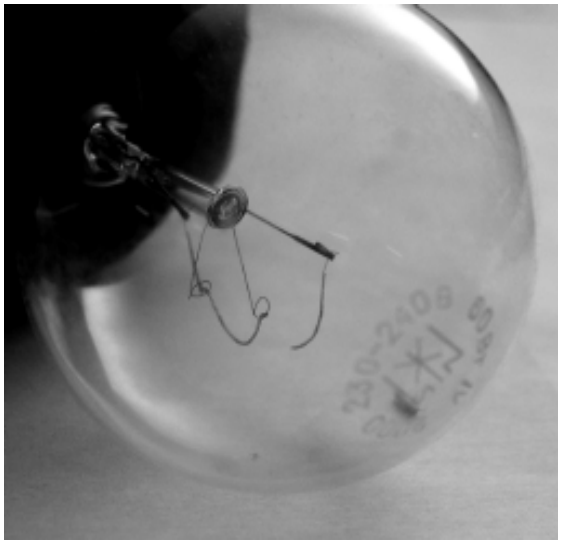

Fig. 5

A burnt-out lamp of 220 V, 60 Wt before the experiment

Fig. 6 is a photo taken during the experiment. You can see a glowing filament and a bright spark in the break point of the filament. Neither connection of a resistor to the transmission line nor using a conductor of high specific resistance as the transmission line could considerably reduce the incandescence of the filament. The degree of incandescence of the filament depends substantially on the size of a gap in the break point of the filament. The experiments revealed that there was an optimal size of the burnt-out section when the incandescence of the

residual filament was maximal

Fig. 6

Glow of a burnt-out incandescent lamp of 220 V, 60 Wt

Practically each of us meets the glow of burnt-out lamps even without knowing it. For that it will be enough just to examine a burned-out lamp closely. Rather often you can notice that the internal circuit of an incandescent lamp burns out in more than one point. It is obvious that probability of burnout of the filament of a lamp in several points at a time is negligible. It means that on losing the integrity of the filament the lamp had been glowing on before the circuit broke in one more point. This phenomenon occurs in most cases when incandescent lamps burn out in the circuit of 220V and 50Hz.

For one of the experiments we connected standard incandescent lamps of 220V, 60Wt to the secondary winding of a step-up transformer. At idle running voltage of the transformer was about 300V. In the experiment there were used 20 incandescent lamps. It turned out that the incandescent lamps burn out mostly in two or more points. Moreover, not only the filament, but also the conductive wires inside of the lamp were burnt out. In addition, after the first break in circuit the lamps went on glowing for a long time and even more intensively than before the burnout. A lamp had been glowing on up to the moment when one more subcircuit burnt out. The internal circuit of one of the lamps in our experiment was broken in four points! Moreover, the filament burnt out in two points and, in addition to the filament, the both electrodes inside the lamps were burnt out as well. Results of the experiment are presented in Table 1.

Table 1

Quantity of lamps used in the experiment	Quantity of lamps with one burned-out point	Quantity of lamps with two burned-out points	Quantity of lamps with three burned-out points	Quantity of lamps with four burned-out points	Quantity of lamps with five burned-out points
20	8	8	3	1	0

Experiments on Wireless Electric Power Transmission

Many scientists all over the world work at solution of the problem of wireless power transmission. Mostly there are studied microwave fields used for the purpose of wireless power transmission. However, the applied microwave systems are not harmless to the man [5]. We present the information on our experiments on realization of wireless power transmission without using the microwave field. We studied probability to transmit power to an electric motor without use of wires.

The system, which consisted of a power supply B5-47, a generator and a transformer, was used in our experiments as a transmitter. A special receiving unit for wireless power transmission served as a power receiver and contained an electronic unit and a DC electric motor IDR-6. In Fig. 7 you can see the general view of our wireless power transmission device.

Fig. 7

General view of the device for demonstration of wireless power transmission

The electric motor is mounted onto a conductive platform, which in its turn stands on a casing made of insulating material (Fig. 8). There is an electronic unit inside the casing.

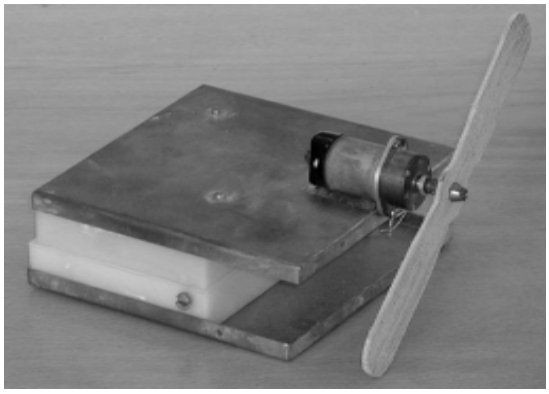

Fig. 8

Receiver for demonstration of wireless power transmission

The electronic unit fills little space inside the casing of the receiver and it is made on a printed board. In Fig. 9 there is presented the interior part of the receiver. It is designed for wireless power transmission.

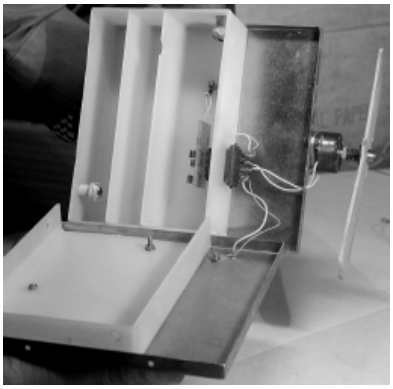

Fig. 9

Interior part of the receiver for demonstration of wireless power transmission

When the transmitter switched on there was observed rotation of the electric motor, which the experimenter held in his hands. Neither the electric motor nor platform was connected to the transmitter. And there were no power supplies inside the casing where the platform and motor were enclosed. When the distance between the receiver and transmitter diminished the speed of rotation of the electric motor increased. In Fig.10 you can see a fragment of the experiment when the frequency of rotation of the motor was sharply rising, if the electric motor was in hands of two experimenters.

Fig. 10

Acceleration of rotation of the motor

Experiments that demonstrate how an incandescence lamp can glowin the experimenter's hand

It is a common phenomenon when a gas-discharge lamp glows in the researcher's hand at using of alternating electromagnetic field. It is unusual that an incandescent lamp can glow in the investigator's hand when only one wire is connected to the lamp. Undoubtedly, a glowing filament of the lamp, which an experimenter holds in hands, can excite interest only in the case when there are no two wires connected to the lamp. It is known that Nicola Tesla demonstrated a glowing lamp that he was holding in his hand. We have not managed to find a description of that experiment, so we have developed our own designs. We have carried out experiments that show how an incandescence lamp can glow in the experimenter's hand. The results of these experiments are presented below. In Fig.11a and Fig.11b you can see variants of the device for demonstration of glow of a 220V incandescent lamp.

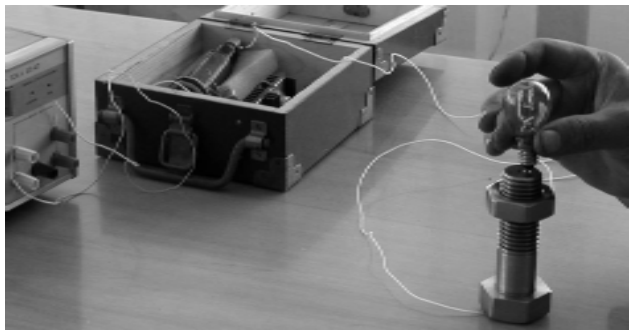

Fig. 11 a

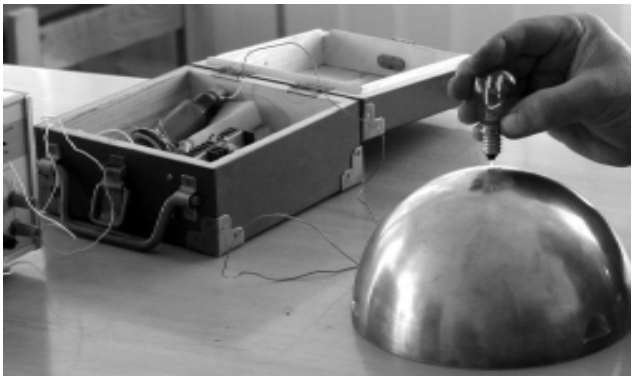

Fig. 11 b

In the experiments demonstrating how an incandescent lamp glows in the researcher's hand we used neither "Avramenko plug" nor receiving units for demonstration of single-wire and wireless power transmission. The lamp in the experimenter's hand glows due to applying electronic units and due to design philosophy of the devices.

Fig. 12 and 13 represent close-up photographs where you can see glowing of the lamps of 220V, 15Wt and of 220V, 25Wt that the experimenter holds in his hands. At that the lamps are not connected to the closed circuit. The higher voltage supplied to the generator, the more intensive was the glow. For the sake of the experiment's safety we supplied to the generator voltage that made lamps glow at about their half incandescence.

Fig. 12

Glow of an incandescence lamp of 220V, 15Wt

Fig. 13

Glow of an incandescence lamp of 220V, 25Wt

In the lower part of the photos (Fig. 12 and Fig. 13) you can see a conductor, which is connected to the generator with one wire. Only one contact of the lamp cap touches the conductor. The other contact remains non-connected. Thus the lamp and the generator are connected with a single wire.

Fig. 14

Authors while making ready their experiment on single-wire power transmission

Fig. 15

Authors while making ready their experiment on wireless power transmission

Perhaps experiments on power transmission by Nicola Tesla were somehow similar to the experiments carried out by us. At any rate the experiments prove that single-wire and wireless power transmission has real perspectives.

In Fig. 14 you can see a photograph of the authors while making ready the experiment on single-wire power transmission.

In Fig. 15 you can see a photograph of the authors while making ready the experiment on wireless power transmission.

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The Possibility of Almost Complete Transformation of Thermal Energy into Mechanical One

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There is a description of thermodynamic cycle of a heat motor with heterogeneous working body. This cycle allows completely transforming a thermal energy into mechanical one. The proof of existence of the cycle and its characteristics is a logic consequence of the first law of thermodynamics. By means of realizing of the cycle it will be possible to create new types of heat motors, which have qualitative advantages in comparison with the known ones. The said advantages are possibilities either to almost completely transform high-temperature heat, which appears as a result of combustion of fuel, to the useful work or to do such work by transforming free heat, which is taken off the matter of environment.

Introduction

The main method to transform thermal energy into energy of other types is using of heat motors (engines), which implement any of closed thermodynamic processes (cycles). For functioning of such devices the presence of two thermal vessels with different temperatures of the heater and the cooler of a working body of a heat motor is required.

In all known heat motors ambient matter is used as a cooler. Therefore the doing of a useful work by known methods is possible only as a result of transformation of high-temperature heat which is created by combustion of fuel.

The main features of known thermodynamic processes, used for the transformation of heat into other types of energy are as follows:

- efficiency of these processes is less than that of Carno cycle for a used temperature interval;
- these processes can not be applied for transformation of free heat, which is contained in the ambient matter.

Use of the invention under the Russian Federation patent [1] will allow to implement the process of transformation of heat, which is free from specified restriction. Federal Institute of the industrial property (FIIP) has included the invention in the list of prospective Russian projects [2].

There is offered the method to do useful work by means of realization of the closed thermodynamic cycle, wherein at some stages matter of the working body changes its aggregative state creating heterogeneous system, consisting of

equilibrium of liquid phases and saturated vapor.

In the offered method the working body does useful work in the process of adiabatic expansion from initial state in the cycle at temperature of the heater up to achieving the state with minimum temperature of the cycle (at this temperature density of the liquid phase of a working body is equal to initial one). The processes of return of some parts of the working body into an initial thermodynamic state are various for matter of each phase:

- The matter of liquid phase has to be returned in an initial state in the process of isochoric heating, by transferring heat from the heater to the matter;

- The matter of vapor phase has to be returned in an initial state by the adiabatic compression up to achievement an initial temperature, by restitution the heat exchange between compressed matter and the heater, by the isothermal compression up to an initial density at transferring of heat from the matter to the heater.

Such realization of the cycle excludes any contact of working body with the cooler (with environment) as well as transferring heat from the working body to it. Due to that, the complete quantity of heat, received in the described cycle by working body from the heater, equals the done work and is non-zero. Thus realization of this cycle will ensure transformation of heat into mechanical work with some output which is theoretically equals 1.

The offered cycle can be realized in a temperature interval, which upper bound will be in the region of temperatures, which are lower than temperature of matter of the environment. It will take place, if some matter of low critical temperature is used as a working body. In this case matter of environment can serve as heater and be a source of thermal energy, which will be conversed into useful mechanical work.

Thus there are qualitatively new results which will be got by using this invention. Among these results we can mention possibility to converse thermal energy into mechanical work with high efficiency as well as possibility to use thermal energy taken off the matter of environment for doing useful mechanical work. The proof of these possibilities is a consequence of the first law of thermodynamics.

Let us note that this proof reveals the contradiction which exists between the first law of thermodynamics and some known formulations of the second law. At that there is revealed the logical incompatibility between both laws and necessity to explain this incompatibility. As the first law of thermodynamics, being the law of conservation of energy, should not be called in question (as well as all its consequences), then there is a conclusion on the necessity to improve some formulations of the second law and to accept the fact that these formulations have the restricted domain of applicability. The question how to resolve the contradiction remains unclosed and does not concern the essence of the invention (the offered method).

Realization of the possibility to make the device which can do useful work by using (conversion) heat energy taken off the matter of environment will allow to create new kind of sources of free mechanical energy which are the most economical and ecologically safe.

The advantages of such devices before other known sources of free energy (hydraulic, wind, solar, geothermal etc.) are as follows:

- greater specific power (per unit of volume);

- working capacity does not depend on external conditions (geographical, weather, time etc.).

The obtained estimations of achievable useful power give the reason to consider it appropriate to use the offered devices in different fields of engineering. Each user by using these devices to satisfy demand for energy or heat will get the possibility either to reduce consumption of energy carriers in 2-3 times or totally remove such consumption.

Mass application of the invented devices can several times reduce requirements of economics in natural energy carriers and therefore to create the possibilities for radical solving of problems which appear because of scantiness of fuel-energy resources and nonecology of the general used heat sources.

The construction diagram of the simplest pattern of the said engine is shown in Fig.1.

The parts of the drawing present: 1 and 2 working

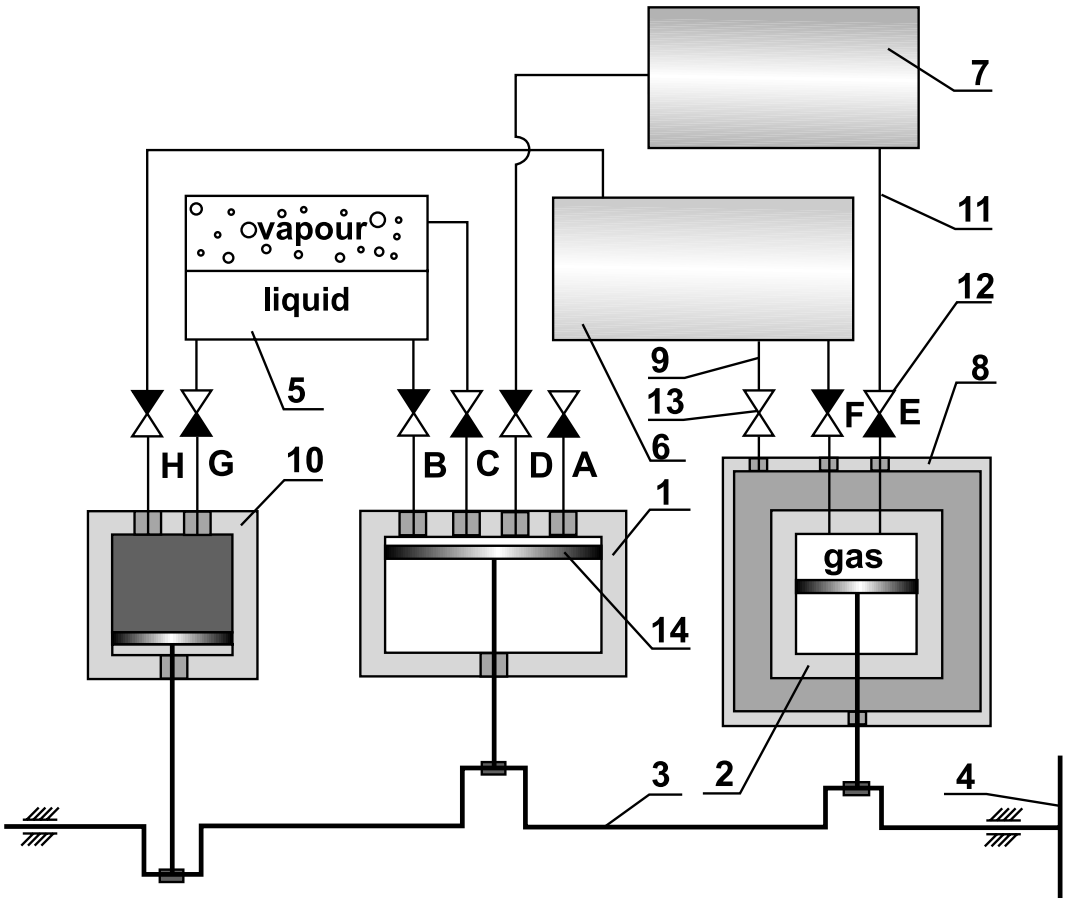

Fig. 1

cylinders wherein movable pistons 14 are placed. The pistons are connected by the crank shaft 3 with the fly-wheel 4. 5, 6, 7 are reservoirs filled with matter of the working body. 8 is the reservoir filled with matter of the heater. 9 is the heat conductor transferring heat from the heater to the matter of the working body, which is placed in the reservoir 6. 10 is the pump, which is set in motion by the shaft 3 and is used for swapping of matter of the liquid phase of the working body from reservoir 5 to the reservoir 6. 11 are pipelines. 12 are the valves (they are marked on the figure by letters), which provide one direction movement of matter of the working body along the pipelines. 13 is the valve, which regulates the size of heat flow through the heat conductor 9.

The reservoir 5 contains heterogeneous matter of the working body at the chosen minimum temperature of the realized thermodynamic cycle. The reservoir 6 contains a homogeneous matter of the working body with initial values of thermodynamic characteristics. The reservoir 7 contains a homogeneous matter of the working body. This matter has temperature of the heater and intermediate density.

The matter in housing 2 is in the state of thermal equilibrium with matter of the heater which is in the reservoir 8. All details of the device have adiabatic heat insulation which provides keeping of required temperature conditions.

The thermodynamic cycle begins when piston of the housing 1 is in the uppermost point. The valve A is opening in this moment and matter of the working body from the reservoir 6 begins to fill the working volume of the cylinder.

Some time later the valve A closes and after this in the cylinder there takes place the process of adiabatic expansion of the working body from the initial thermodynamic state. The process results in separating of the expanding matter into equilibrium phases of liquid and saturated vapour. The process continues until the piston reaches the lowermost point. The valve B opens in this moment and the heterogeneous matter with minimal

temperature in the cycle is displaced in the reservoir 5 while the piston moves back. The displacement continues until the piston reaches the uppermost position and valve B closes. At the repeated motion of the piston from the uppermost point the saturated vapour is absorbed into the working volume of the cylinder from the reservoir 5 through the valve C. When the piston reaches the uppermost point the valve C closes and when the piston moves back there is the process of adiabatic compression of the matter of vapor phase.

When the temperature of the compressed matter becomes equal to that of the heater, the valve D opens and compressed matter is displaced in the reservoir 7. The displacement is over when the piston is in the uppermost position. At that valve D closes and the cycle of working processes repeats in the housing 1.

The processes in housing 2 are organized in a like manner: the working volume is filled through the valve E when the piston of the cylinder is in the uppermost point. While the piston moves the matter is absorbed into the working volume from the reservoir 7. The absorption is over when the piston is in the lowermost position, then the valve E closes. At that the backward movement of the piston is accompanied by isothermal compression of the matter in the working volume. When density of the compressed matter is equal to the initial one the valve E opens and compressed matter is displaced into the reservoir 6. The displacement continues until the piston reaches the uppermost point. After that the valve F closes and the cycle of the processes repeats in the cylinder 2.

Stability of the device is provided by swapping the matter of the liquid phase of the working body from the reservoir 5 into reservoir 6 by means of the pump 10 and valves G and H. By means of movement of the pump piston from the uppermost point the working volume is filled with liquid from the reservoir 5 through the valve G. At the backward movement of the piston the liquid is displaced through the valve H into the reservoir 6.

The initial temperature of the working body in the working cycle of the described device can be chosen either greater or less than temperature of the environment. If we choose the first variant then it is necessary to hold temperature of the matter of the heater at rather high level. It can be achieved by use of high-temperature heat, which is produced as a result of fuel combustion and is transferred to the heater by means of some known heating apparatus.

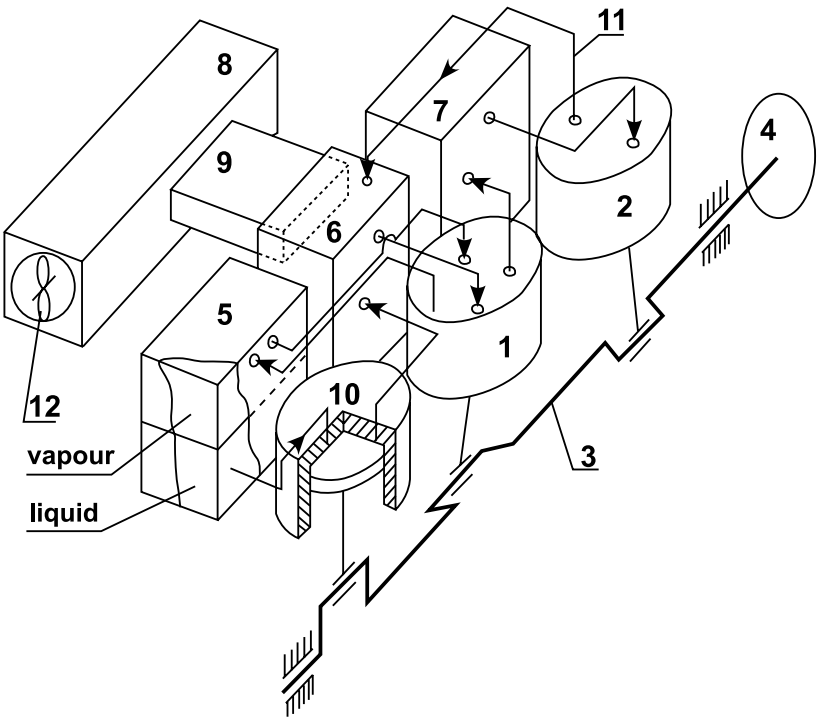

Fig.2

The main qualitative advantage of the device is its greater efficiency (achievable output), which can not be achieved in the processes of functioning of known heat engines.

The realization of the second case, wherein the initial temperature of the working body is less (or equal) than that of the environment, will allow to use the matter of environment as a heater and to convert the heat, which is partaken from it, into useful work. In that case the described device will represent a new kind of early unknown sources of free mechanical energy. The possible variant of such source is represented in the Fig. 2.

The heater 8 is made as heat exchanger, which is connected with the end of the heat conductor 9. The ambient matter is pumped through the heat exchanger by means of propeller 12. The cylinder 2 and the reservoir 7 can be in the state of thermal equilibrium with the environment.

Below there are some estimates of parameters of the concrete variant of proposed thermodynamic cycle to illustrate technical capabilities of the described heat engine:

- nitrogen (N_2) is chosen as a matter of the working body;
- the minimum and the initial temperatures of the working body are taken equal;
- 73 °C and -123°C (100 and 150°K);
- the initial pressure of the working body is taken equal to ~ 500 bar;
- the temperature of the heater is supposed to be ~7 °C (the value is close to average temperature of environment);
- the specific quantity of heat (which the working body gets from environment matter in the cycle and which is converted into useful work) is equal to ~ 63 cal/mole;
- if the working volume of the cylinder 1 and duration of the cycle are taken equal to V ~1 litre and t ~0.02 sec, then achievable power capacity of the device is ~130 kWt.

The achievable power capacity of the device represented in Fig. 2 is defined by two parameters:

- by cross-sectional area S of the heat exchanger, through which environment matter is pumped;
- by temperature difference in a flow of environment matter at the inlet and outlet of the heat exchanger.

Let us accept the values equal to S = 0.25 m^2 and "T = 10° C for these parameters, then we get an estimation of power capacity equal to ~ 107 kWt.

Conclusions

1. There are received the estimations of an achievable useful power capacity of the devices which are designed for effective conversion of heat into work. These estimations allow to suppose wide use of these devices in different fields of technique as possible and expedient.

2. Each user by using these devices to satisfy demand for energy or heat will get the possibility either to reduce consumption of energy carriers in 2-3 times or totally remove such consumption.

3. The economy, which can be achieved as a result of reduction of systematic coasts on purchasing of fuel, will quickly cover a cost of the invented devices.

4. The qualities of the devices (high efficiency, autonomy, ecological compatibility) will ensure high and stable income to those businessmen who will organize sufficiently considerable production and realization of these devices.

The investors are invited to participate in realization and commercial use of the invention.

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Inventor Club of Russia

Review by our correspondent Alla Pashova

Inventors are interesting people. This opinion is shared by common people as well as by journalists, for whom modern "Kulibins" are a reliable source of sensational information. And the inventors themselves will also say: "Our creations are of no analogues and we themselves are noteworthy". However, as Mark Twain said: "The man with a new idea is a crank until the idea succeeds". But the success of ideas of Russian innovators or, in other words, practical application of these ideas requires investments. It has turned out that attracting investors' attention is much easier when the creators are united and promote their ideas to the market by common effort.

One of such unions is "Inventor's Club of Russia" situated in Kronshtadt (Russia) (http://zavclub.chat.ru/zcp.html). Information from all over Russia as well as from neighbouring countries (Byelorussia and Moldova) concentrates in this quiet town near St. Petersburg, right in the home computer of Alexander S. Tukanov (Head of the Club).

In his time Alexander S. Tukanov graduated from Machine-Building Institute of Kurgan, but he worked little by his profession. As early as in Soviet times, instead of attending to tractors and trucks, he took a great interest in computer technologies. In 1996 Tukanov moved from Naberzhnye Chelny to Kronshtadt. Naturally, being engaged in invention for all his life, he wanted concerned people to get to know about his achievements. For that purpose in the end of 1998 Tukanov created his own web site in the Internet and invited interested people to join the project. Y.A. Nechaev, specialist in electronics, became the first member of the Club. Then he and Tukanov evolved the idea of connecting the telephone and Internet lines to the common power grid of 220V. Tukanov still considers the idea to be promising, but at that time it was not realized: there were nor material resources no investors.

Bit by bit new people joined the Club. They had interesting inventions, but no opportunities to apply them. The Club's "Intellectual Property Online Shop" is of much use for the inventors in this case. "Russian online market of intellectual property does not practically exist," – Tukanov claims. – Extreme imperfection of Internet in Russia is a drag of its development. The Americans tried to cooperate, but failed. In Moscow, for instance, the Internet does function at a decent speed, but to download a web page created somewhere in Irkutsk will take about twenty minutes. That is why we may say our Shop is quite unique. The offers presented at the web site spark great interest. For example, about fifty people have responded to the offer to build a magnetic motor-generator. Among them there is even a clergyman, Father Sergiy".

The following system to apply inventions, available in the USA, seems to be reasonable to Alexander S. Tukanov: "Have you heard about "Arthur de Little", an American company that applied the penicillin? It has over 200 branches in different countries. "Arthur de Little" uses the following scheme. First of all it signs a one-year contract with the inventor and gets a detailed description of the invented device. After that the patent searching follows and the invention is patented. Then they find a company that makes a prototype model and carries out practical research work. Eight of one hundred inventions applied in such a way make profit and two of them make excess profit that covers all the expenses. In addition "Arthur de Little" has full insurance against all the financial risks that it takes while applying every innovation. Such a business is regarded to be so much profitable that State Pension Fund of the USA places its capital in innovations."

"There is only one confusing point in this system, – says Tukanov in addition, – there is no prepayment". However, Russian investors promise to prepay neither. "Every investor in our country considers himself to be an expert and insists on detailed explanation of the invention, as if he were a patent attorney. Many investors in Russia have criminal past in business. Such people want to get their surplus profit served an apple on a silver

platter. However nothing venture, nothing have! It takes from 5 to 8 years to grow the tree before the apple ripens. An apple tree gives only 4-6 apples of its every hundred flowers and the rest are barren flowers. But these barren flowers are not useless and the tree spends its energy for them too. There are no useless actions in nature. The idea of skimming the cream off is of no new and ends up with failure or crisis. According to Marx, any profit over 25 % is a criminal profit. And in Russia even a profit of 250% attracts no investors! They demand multiplying this figure by 10. And the myth of unlimited intellectual potential of Russia will be destroyed soon. It is impossible to make someone invent: money cannot buy creation".

Editor's: Below we publish a description of an experimental device designed by Alexander S. Tukanov, and an article by Sergey N. Schmidt, one of the permanent members of the Club.

Vector Propulsion Engine (Electromagnetic Version)

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The device is designed to generate unidirectional force which influences the whole construction. The design is based on the principle of unbalancing within the circular path of movement of mass of the weight. This path is limited by a sector located between two poles of an electromagnet (EM). Two electrical motors rotating in different directions generate centrifugal force. There is a weight (G) made of m-metal. It is mounted between two friction disks. The weight (G) is in oscillatory motion. It moves from one pole of the magnet to the other by the circular path. The generated centrifugal force is cyclic in nature and imparts propulsive force to the whole device. We can control it by increasing the number of rotations of the motor. We can change the direction of movement by turning the electromagnet together with the weight relatively to the entire device.

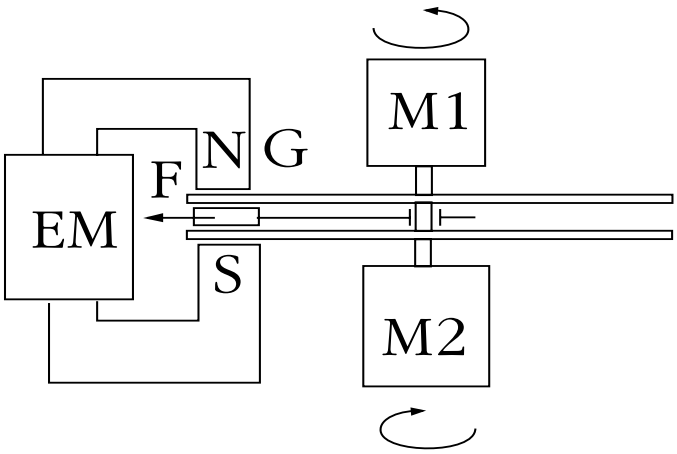

Fig. 1

The centrifugal force changes from zero to maximum and back to zero. Its direction is invariable notwithstanding that the direction of movement of the weight does change.

We can both increase and decrease the propulsive force by specifying mass of the weight, number of rotations of the motor and magnetomotive force of the magnet.

Inertial Dynamic Generator

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*At the heart of a new experimental device called "Karusel" (carrousel) there is a "**motor - unbalanced flywheel – generator**" system. Sergey N. Schmidt has carried out an experiment that shows the generation of excess power or excess torque, which accelerates the rotor and the flywheel of electric machines. Moreover, during the experiment it has been observed that the generated power is increasing and power consumption of the motor is decreasing. "Karusel" is just a reduction of a prospective industrial inertial dynamic generator (IDG). The IDG enables to convert the kinetic energy of the Earth's movement and to apply it for doing useful work.*

Working model of the IDG

The device is the simplest prototype of the inertial dynamic generator. It consists of a motor and a DC generator, which has no exciting coils. The motor and generator are mounted coaxially.

On the shaft of the "motor-generator" system there is an unbalanced flywheel, which is mounted to convert the energy of rotation of the Earth. The generated excess torque sets in rotation the system consisting of rotors of electric machines and the flywheel.

The motor of the device is connected to a stabilized power supply of 14 V. In order to provide fail-safe operation there is a ballast resistance, which is connected in series to the motor. The generator is connected with a load of lamps in series.

When the device operates with one lamp in the circuit of the generator there have been registered the following data:

Power in circuit of the generator: $W_{g0} = 0.34 \times 2.51 = 0.85$ W

Power of the motor: $W_{d0} = 1.55 \times 7.69 = 11.92$ W

Power consumed from the power supply: $W_0 = 1.55 \times 14 = 21.7$ W.

Then we are connecting lamps to the generator. For this design the maximum quantity of lamps is seven. Under such conditions the resistance in the circuit of the generator rises and it results in decreasing the current and the moment of resistance.

The motor starts accelerating that, in its turn, leads to raising the voltage on the generator terminals and increasing the current and the generated power.

At the moment of connection of all the seven lamps the rate of input voltage will be equal to 14 V (as well as in the first case). In this mode of operation there have been registered the following data:

Power in circuit of the generator: $W_{g1} = 0.17 \times 11.66 = 1.98$ W

Power of the motor: $W_{d1} = 1.21 \times 9.81 = 11.87$ W

Power consumed from the power supply: $W_1 = 1.21 \times 14 = 16.94$ W.

As is obvious, *the increase in power generation has caused the decrease in power consumption.* Power of the generator and power consumed from the power supply have not risen, but they have been even considerably reduced. The energy balance has been upset. We can unambiguously state that *the system receives excess energy.*

Certain pessimists will try to consider the process taking into account the redistribution

of energy loss in the power source. However the author has carried out experiments with many different power sources including chemical ones and in all the cases there has been observed *acceleration of the unbalanced flywheel.*

Prospect application of "unbalanced pulse": from prototype to industrial generator

If we irrefutably prove that behaviour of elements in a loop system is tightly connected with parameters of movement of the system we will be able to control such processes. It clears the way to creation of motors and generators of a new type, independent systems of navigation and to many other applications.

I assert that in all these cases the "unbalanced pulse" does arise in a mechanical loop system and it does cause changes in the speed of rotation of the unbalanced flywheel, which moves with steady speed relatively to a gravitational object (the Earth, the Mars etc).

The idea of using the "unbalanced pulse" for converting kinetic energy of the Earth first came on carrying out the first experiments and it was "provoked" by mass breakdowns and cut-offs of electric energy in the Far East. It is impossible to remain indifferent watching entire cities freeze out. As a result the problem of developing of a fundamentally new source of energy becomes the most urgent.To study these processes I have developed an experimental device named *"Karusel"*, which is able to demonstrate all the possibilities of using the "unbalanced pulse", including the motor and generator modes of operation, navigation and registration of geotectonic processes.

In Fig.1 you can see a mathematical model of the device. It consists of flywheels (M1, M2 and M3) that are driven by motors (D1, D2 and D3). On the flywheels M1 and M2 there are pendulum arms (MR) with springing elements (Ue). The motors (D1 and D2) are mounted on arms (Pk1 and Pk2), which are hingedly connected with the flywheel (M3) and have springing elements (Ue).

At the initial moment the pendulum arms are motionless and their oscillating around the hinges is limited by the springing elements (springs). The prototype is a system of forced oscillations that is able to "resonate" at a certain combination of speeds of rotations of the flywheels.

The effect of resonance is quite undesirable for our investigation of the "unbalanced pulse", but we have to take it into consideration.

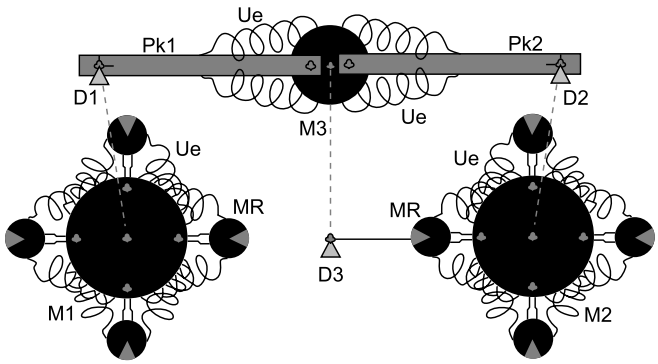

Fig. 1

If we impart alternating torque to one of the motors (e.g. the motor D1) then the arms Pk1 and Pk2 of the "carrousel" will start oscillating.

The system is very sensitive to changes in the parameters, so the registration of the "unbalanced pulse is based on this feature.

The flywheels of the physical model are driven by the motors at steady speed of their rotation. Appropriate gauges control the process. Magnetic clutches make the flywheels rotate at "real" speed resulting from the influence of the "unbalanced pulse".

In addition the pendulum arms will start moving and we will be able to register the movement with measuring devices. The arms of the "carrousel" will begin oscillatory movements and the gauges will register them as well.

At a certain combination of the parameters of rotation, moments of inertia and rigidity of the springing elements we can observe "self-acceleration" of the flywheels, which will indicate that the installation has switched to a generator mode.

At that time it will be enough just to register decreasing in the current power that is consumed by the electric motors. Switching to the full generator mode presupposes some problems of technical nature. The most

important of them is the reducing of the coefficient of friction in the supports – it should be less than 0.001.

Preliminary calculations demonstrate a higher coefficient of friction, but "unforeseeable consequences" should be taken into account as well. For instance, let us take a device, which provides the generator mode, and consider the dependence of its mechanical output from the width of the area, which is represented by linear speed of motion of points of the earth surface.

High-precision bearings create the necessary conditions, but we should also take into account certain peculiarities of operation of the device. The "unbalanced pulse" produces alternating loads to the bearing units. As a result of it the coefficient of friction increases. It is necessary to mount magnetic supports that would be able to take both radial and axial loads. In that case we could considerably decrease the coefficient of friction in many times.

We can register operation of the device in the motor mode by the degree of deviation of the arms of the "carrousel". We will learn the value of "propulsive" force by means of piezoelectric dynamometers, which are mounted between the arms and stationary construction of the "carrousel".

Operation in the generator mode is based on oscillating of the pendulum arms in the hinged joints (bearings). The idea of converting mechanic energy of oscillation of the pendulum arms directly into electric energy using piezoelectric cells seems to be very promising.

The "touchy" point of converting mechanical energy of the pendulum arms is the use of rather low efficient ordinary electric generators. We can use a "looped" mode of power takeoff of the generator to overcome this impediment.

At first the flywheel is accelerated with an "unbalanced pulse" up to critical speed of rotation (the maximum permissible speed, which depends on structural features of the materials). Then it is connected to an electrodynamic generator and braked down to the minimal speed in the "self-acceleration" mode.

After that the electrodynamic generator switches off and the flywheel spins up to the maximal speed again.

Most probably, *the device of an industrial generator* should integrate several flywheels, which rotate on the same shaft and have controllable linkage with it (clutches). The clutches will regulate the top speed of acceleration of the flywheels and the takeoff power. It is necessary to work up a circuit of automatic regulation that depends on the load.

So the device starts resembling a computer hard disk. But, unlike the later, the generator disks are unbalanced. If the disks rotate at the same speed and we manage to design an appropriate bearing unit, then power density of the generator per a mass unit can be very high!

The idea of converting mechanic energy of oscillation of the pendulum arms directly into electric energy using piezoelectric cells seems to be very promising.

There is an interesting question: is it possible to create a generator of 5 kWt/kg, i.e. of the size of a common hard disk? (Only the accelerating unit is meant here.) For that one should swing a pendulum (weight is 1 kg, length is 0.1 m) up to the speed of 10000 rpm and make it brake within 1 second:

$E=V^2/2=(2\pi\cdot 0.1\cdot 10000/60)^2/2= 4.93$ [kJ/kg]

Editor's: The author also offers a device, which combines unbalanced disks with non-linear dynamics and an electric machine.

Physical model of the inertial dynamic generator

The "carrousel" and flywheel are driven with DC motors (capacity is 20-30 Wt, voltage is 12 V). The speed of rotation should be continuously regulated within the range from 0 to 1500 rpm. The shafts of the flywheel and electric motor are connected with a dirigible electromagnetic clutch (or with permanent magnets).

The shafts of the "carrousel" and the electric motor are connected by a drive-down with an electromagnetic clutch (or drive belting). All the parameters of operation of the motors (current, voltage, power consumption, speed of rotation) should be monitored with high accuracy.

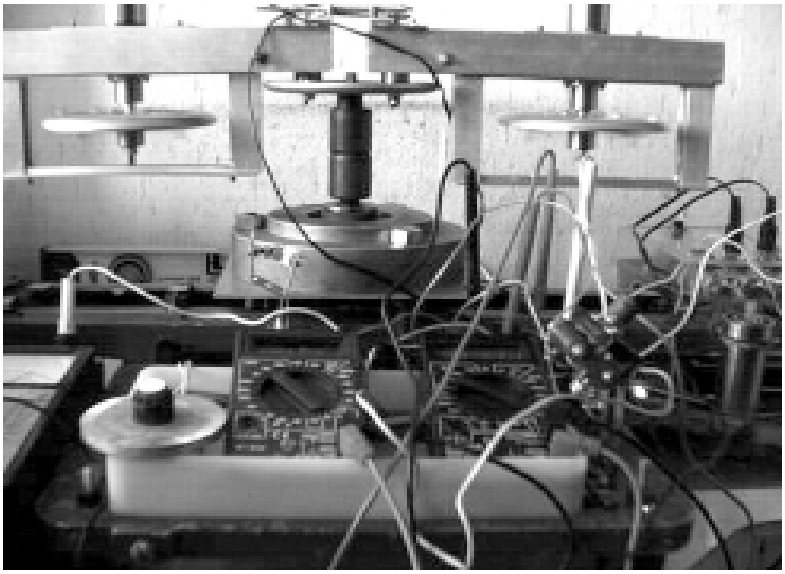

Fig. 2

The carrousel consists of a two-armed rocker, on the ends of which there are mounted flywheels with drives. The arms of the rocker are connected hingedly with the driven disk of the "carrousel". The reach of the arms is 0.2-0.4 m.

The radial stress inside the hinge must be controlled, as well as the tangential forces of each arm (moment of action) to the driven disk of the carrousel. The control is realized with piezoelectric transducers in the mode of current time taking into account spatial orientation of the arm in relation to the supporting platform of the "carrousel" (See Fig. 2, Fig. 3 and colour cover pictures).

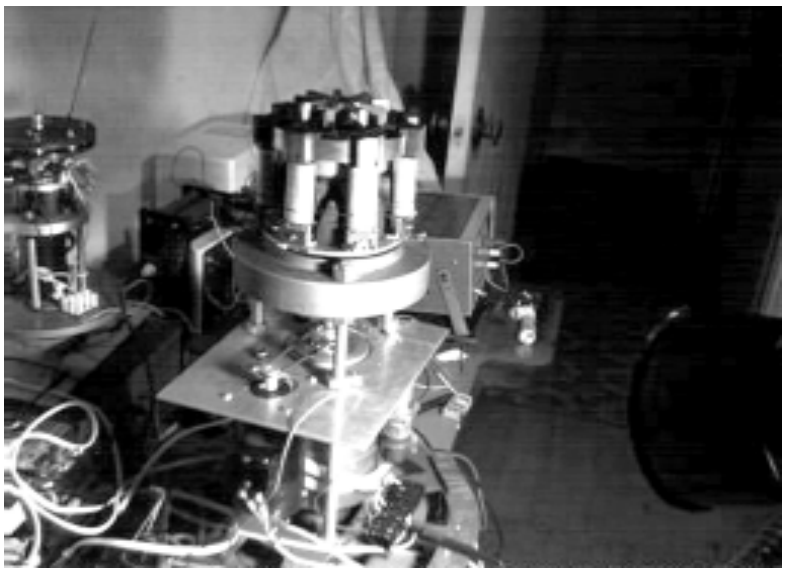

Fig. 3

There are 6 oscillating arms mounted on each flywheel. Controlled springing elements (springs) with piezoelectric stress control are mounted between the arms. Angular displacement of the arms in relation to the radial direction must be also controlled with high accuracy. Methods to control the angular displacement are not regulated. It may be an optical or a contact electric system with resistance control. In the later case it is necessary to take into account the changes in temperature occurring on the contact surface during long-term operation.

At the same time the contact electric system is much simpler and enables to bias resistance range at controlling the position of every arm. So we may display all the graphs of oscillations of the arms simultaneously. We can also easily output tabular data in a discrete time interval.

The required control interval is to be 1-100 microseconds. We are to get tabular data of control of displacement of the arms in relation to the radial direction at the current moment of time. In addition there must be made marks of orientation of the flywheel in relation to the arm and the support platform.

The power unit contains separated power channels to supply the electric motors and the electronics. The motors may have one common neutral. The neutral of electronics is isolated as an independent line. Supply voltage of motors of the flywheels is 12 V, one of the electronics – 5-6 V. The voltage of electric motor of the carrousel is not regulated.

For each arm of the flywheel in the control unit there is a channel leading from the variable brush resistor and a double channel from the piezoelectric transducers. Each flywheel requires a twenty-wire line. Meanwhile the piezoelectric transducers may be not used, so there will be only an eight-wire line (Fig. 4).

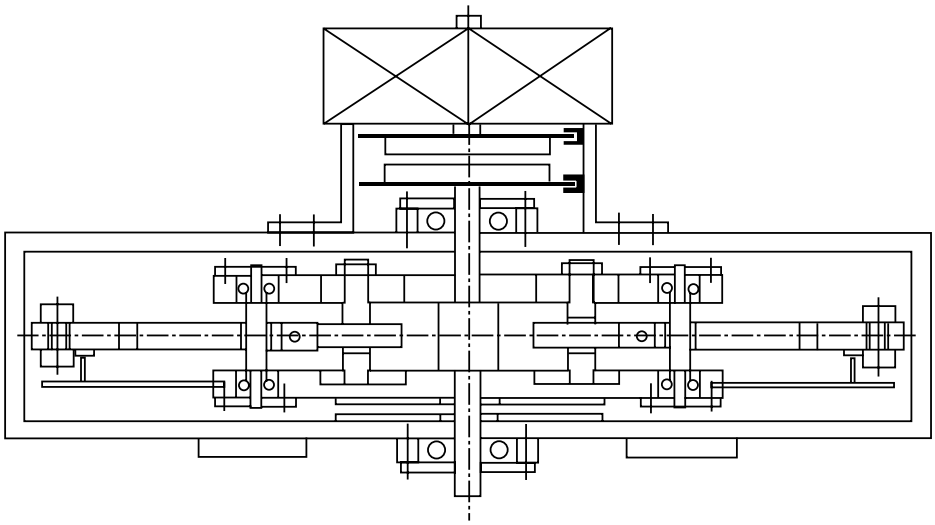

Fig. 4

Energy and safety

How safe are the present methods of power generation? Let us consider and compare all the known devices and technologies that provide the humanity with electric power:

1. Wind energy conversion devices: wind motor integrated with the electric generator
2. Devices made to convert energy of falling water: hydroelectric power stations, tidal power stations
3. Devices made to convert heat energy, which is generated in combustion process: heat power stations
4. Photocells
5. Nuclear energy sources: atomic power stations, isotopic cells
6. Water-hydrogen energy converters
7. Non-linear dynamic generators.

Their comparative appraisal can be based on the following parameters:

1. Environmental impact
2. Safety
3. Service life
4. Efficiency
5. Probability of disastrous effects

Device	Comparative parameters					
	1	2	3	4	5	
1. Wind	None	Medium	Medium	Low	None	
2. Hydro	High (-)	High	High		High	Extremely high
3. Heat	High (-)		Medium	Medium	Medium	Medium
4. Solar	None		Low	Low	Low	None
5. Nuclear	High (-)	Medium	Low	Low		Maximal
6. Hydrogen	Low		Medium	Medium	High	Medium
7. Non-linear	Dynamic (+)		High	Medium	High	None

As for the general level of safety the non-linear dynamic generators rank the first place. The wind and solar devices follow them. The nuclear power stations and hydroelectric stations are the most hazardous. Potential disastrous effects of nuclear explosions, earthquakes or dam breakdowns bring to naught all the assurances in their safety. The humanity has already faced such catastrophes.

The disastrous impacts of the hydroelectric power stations include not only possible destruction of dams, but also excitement of geotectonic processes as a result of operation of hydroelectric generators in the infrared mode of oscillations.

The non-linear dynamic generators can exert positive influence over the environment by creating oscillations of certain frequency. This makes possible to turn radioactive isotopes into a stable state without upsetting the energy balance. Furthermore, the non-linear oscillations are able to reduce geotectonic stresses and to prevent catastrophic earthquakes.

Of course, the non-linear oscillations can be used for destruction as well, but it is not easy to find an algorithm to control such processes and it is even more difficult to make an appropriate device for it. That is why we can say for sure that it is really practicable to exercise an effective control over such attempts. Moreover, mass application of low-powered non-linear generators will practically eliminate the possibility of careless use of this technology. The system will start working in autosafety mode and neutralizes dangerous impacts.

New technologies and employment

Application of the inertial dynamic generators will not lead to mass unemployment in the domain of production and processing of natural energy resources. It is essential to understand that the inertial dynamic generators cannot yet solve the problem of usage of mineral oil at transport. Neither the heat power plants will be shut down at once. The process of changing over the inertial dynamic generator will take no less than 10 years and it will give rise to competition, which will force owners of the heat stations to reduce prices as well as pay attention to the safety and ecological compatibility of their heat power plants. One may say that the inertial dynamic generators merely optimize the production and consumption of energy resources. It will be possible to shut down the most hazardous objects of power engineering and to turn down building new “doubtful” objects.

The advent of personal computers has not caused mass dismissals of technicians-and-engineers. Neither the application of inertial dynamic generators will entail mass unemployment. On the contrary, many enterprises and hundred thousands of people will be engaged in the field of the production and maintenance of inertial dynamic generators. Cheap energy will let many industries develop and thereby millions of people will get jobs.

It is important to notice that the new technology will help science and engineering to get out of a “depression” and thus, naturally, will entail creation of new working places.

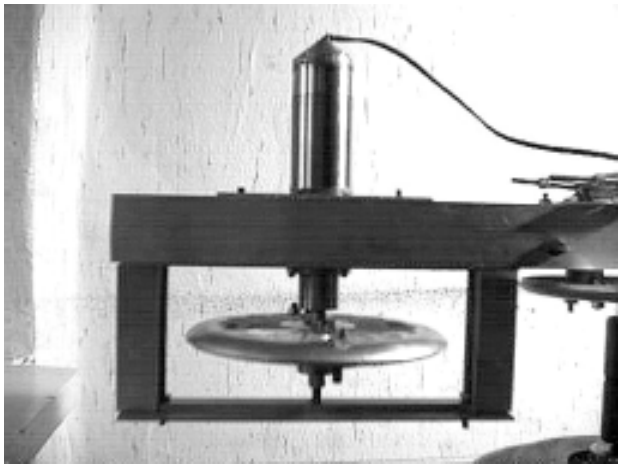

Fig. 5

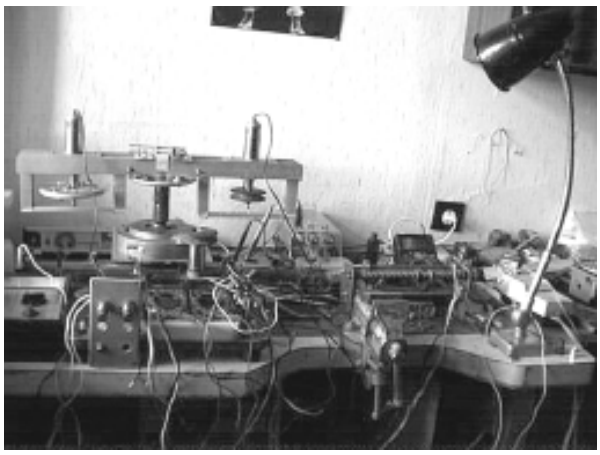

Fig. 6

Latent Potential Energy of Electrical Field

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The present article makes an attempt to solve many of the most critical problems in Power Engineering and Mechanics. The author presents and thoroughly substantiates a new prospective trend in Energy Science, namely Electrical Field Power Engineering and Mechanics. The author's particular inventions illustrate a new efficient technology that generates kinetic and electrical energy of the potential energy of electrical field. The scientist hopes that the article will arouse keen interest of wide circles of readers and will contribute to the progress of power engineering and ecology.

SOCIAL AND ENERGY PARADOXES

The process of evolution in the world power engineering has resulted in a rather paradoxical and contradictory situation: on the one hand, the modern civilization has a dire need for clean and cheap energy, on the other hand, nature and civilization themselves are under the threat of dying-out due to increasing energy and ecology crises. That is why it is time to break this energy deadlock. Many far-seeing and enlightened people fully appreciate it.

But do we try hard enough? Scientists and specialists know well that much valuable information on new energy technologies and energy saving has already been accumulated in the world, however, in fact, this information is hardly ever applied. The reason is that a drastic and fast progress in power engineering and energy consumption technologies may be unfavourable for many of the world monopolies. Their profit depends directly on imperfections of this system. The less efficient the power engineering is, the more expensive energy is. And the less perfect technical devices are, the more power they consume.

Civilization needs clean and inexhaustible energy very much, because, as a matter of fact, mankind has already come into a global energy and ecology crisis. Scientists and engineers do not yet know exactly what *Energy* is and for the moment determine it just as *the capacity of a matter for doing work*. At present the science operates with laws of conservation of only known kinds of energy.

On this vague theoretical basis official science often rejects any concepts of devices that use the latent energy of matter with high efficiency (with an output over 100%). At the same time science is tolerant towards the heat pump with its extremely high energy datum. It is of common knowledge that a heat pump uses and converts low-grade ambient heat with an efficiency of 200-300 % [8].

Is there a way out of this psychological and energy deadlock of the civilization and where exactly does it lie? The simplest answer is the following: for that we should go back to the beginnings and revise our basic knowledge and fundamental principles of power engineering and technology. But first of all we will have to answer several seemingly easy questions.

What is energy?

Energy is determined as the capacity of forms of matter to do work and as the general measure of motion of the matter [10]. However Energy is much wider and yet unknown notion and phenomenon, because science is yet far from being fully aware what Matter is. Experimental data form the basis of scientific knowledge. However imperfect past experiments go out of date and new unusual and sensational experiments of modern

scientist take their place [1, 3, 7, 8, 9]. Thus all the known laws of energy conservation, formulated on the base of out-dated experimental data, are of rather limited use and require correction. Moreover, many of the latest experiments break the existent laws of energy conservation, so it is time to widen the notion of Energy and the formula of its conservation laws.

Under the impression of incontestable results of a number of tests and experiments (such as experiments on cold thermonuclear fusion, vortex heat generation in water and others [8, 9]) more and more serious and objective scientists become supporters of the Aether Theory. In particular, the experiments by N. Tesla and his followers show that *Aether* (being more subtle a matter than the known material world) is also full of energy and ready to supply it to us [10].

But are we ready to take it and in what way will it be easier to do? In view of these new experimental data, to my mind, we have reached the point where it is necessary to revise the fundamental notions of modern science, namely the notion of Energy and the law of conservation of Energy. The first attempt to amend these basic concepts of physics is presented below.

Energy is the reciprocal motion of all the known particles of matter one relatively to another, as well as the motion represented by transmutation of these particles (elementary 'bricks' of matter) from one form of matter to another, as well as the rotation of elementary particles of matter.

Universal Law of Conservation of Energy (ULCE) should be interpreted as a constant of this total momentum. There is a possibility to use and convert latent energy of electrical fields into real useful Energy and this is *an important practical consequence* of the ULCE. But how can it be put into practice? Let us tell about it below.

Why do we need energy carriers at all?

This question seems to be simple only at first sight - "to generate other kinds of useful energy: kinetic energy, electrical energy, as well as heat, cold and light" – you will answer. That is right. But then the next question follows: is it possible to get all these secondary kinds of energy without burning fuel at all? This will remind you of the energy of the Sun, wind, rivers and seas. And then you will reply nevertheless: "No, all these nonconventional energy technologies are not yet perfect and they are far from covering the shortage of required power". But in this case, is there an effective and easy way out of Energy deadlock at all?! It does exist and lies in the following:

- at first it is necessary to radically improve all the energy converters and thereby steeply decrease fuel and energy consumption for doing useful work;

- we need to learn how to generate, convert and use the latent energy of matter and the renewable Energy of ambient space in an efficient and easy way.

Where is the generated energy spent nowadays and why are all the energy consumers so imperfect?

The simple answer is the following: at present over a half of all chemical energy of nonrenewable energy carriers (e.g. different kinds of fuel) is spent on heat loss and toxic emission. It happens because the energy converters and consumers have yet extremely low output for they use and consume primary fuel and (or) electrical power to convert it into work (e.g. in motor transport) and into other kinds of useful energy (e.g. for lighting) in a quite inefficient way.

Let us consider output of an electric power device as the ratio of the useful work to the expended primary energy (the chemical energy of fuel and of energy carriers) it becomes obvious that the existent power engineering is extremely inefficient indeed. For instance, the real output of modern heat machines (including internal-combustion engines) does not exceed 30%.

The output of heat power plants during power generation is no more than 40%. The output of electrical light devices is quite low as well, e.g. one of an incandescent lamp is just 5-7%! The output of urban systems of heat generation, transmission and distribution is no more than 50% and they are utterly unsafe, etc.

That is why we must urgently and efficiently improve the energy converters and carries in order to alleviate the energy crisis of the civilization. But how can we do it? There can help my inventions in the sphere of energy

conversion as well as new methods of application of the latent energy of matter, in particular, new technology of using the potential energy of electrical field.

BASICS OF ELECTROPOTENTIAL POWER ENGINEERING

Doing useful work requires energy and force. As for the definition of energy it has become more or less clear. And what is force? Force is the measure of action of a field (e.g. of mechanic, electrical and other fields). In this particular case it is essential that any force is able to do work.

The notions of field and force are not yet clearly determined in science at all. However everybody knows how to generate an electrical field and Coulomb forces. All we have to do is figure out how to use this force for common benefit.

Mysterious Coulomb force and useful work of electrical field

Free electrical charges and powerful electrical forces of their interaction (e.g. thunderstorm phenomenon) exist in Nature regardless of whether we want it or not. The electrical forces generate electrical charges and electrical fields and these forces are enormous. As everybody knows from high school, Coulomb's law (one of the fundamental laws of physics) states that the force between two electrical charges depends only on the amount of the charges and the distance between them, but does not depend on weight of a body.

The potential Energy of electrical field as well as huge Coulomb forces can be used for doing work without fuel and at minimal energy consumption. For doing work in this case we can use just a single electrical potential. So the proposed method may be regarded as a new method of Electropotential Power Engineering.

Physical substantiation of realizability and efficiency of new Electropotential Power Engineering

One coulomb is defined as the quantity of electricity transmitted by a conductor (e.g. by a filament of an incandescent lamp) in one second at a current of one ampere. Even in the electrical supply network of an apartment those coulombs of electricity can be found in abundance. And what will be the amount of the repulsive force of two electrical charges (1 coulomb each)?

Two identical bodies, which have a charge of 1 coulomb and are initially set apart at a distance of 1 meter, repulse one another with the force of 10^{10} N (one can find the formula of Coulomb's Law in any physics textbook). The paradox is in the following fact: it is common knowledge that Coulomb forces are incredibly immense, but in fact they have not been used in power engineering till present times.

These forces are the most powerful forces in Nature, second only to nuclear forces. Coulomb forces arise everywhere, where there are electrical charges and the task is to extract such forces from bodies and make them work for the mankind.

Power input to generate potent Coulomb forces can be minimal. It is amazing that the generation of such huge forces requires neither high charges nor high power consumption. Hence to generate electrical charges of necessary amount we will need practically no electrical energy and, of course, no high currents. In this case we deal with electrostatics and that is the explanation why the use of Coulomb forces seems to be so advantageous in practice.

We can vary Coulomb forces by adjusting the amount of the electrical charges.The ability of like charges to repulse one another using Coulomb force is the most promising and valuable for the new electropotential power engineering. It means that the effect of electrical breakdown between two charged bodies is excluded and the charge will not drain from their surface.

Mechanical motion and mechanical work created by Coulomb forces of repulsion

As everybody knows from high school, works is calculated by multiplying the length of the path by the component of the force acting along the path and like charges attract one another.

The mentioned Coulomb's Law traditionally determines the effect of force interaction of electrical charges. These facts are well known to everyone, however few people surmise that Coulomb forces can be immense at certain conditions.

These forces are quite able to do useful work at minimal electrical power consumption for they can make charged bodies move.

Let us explain it by the following example. It is plainly understood that if a high electrical potential is supplied instantaneously through a single conductor to two bodies, which are initially in contact, the bodies will immediately be charged with electricity and start repulsing one another.

These powerful forces of electrical repulsion make the charged bodies move in the opposite directions.Consequently, Coulomb forces (for example, repulsive forces) of like charged bodies are able to do useful work at practically zero power consumption by converting the energy of electrical field of a single potential into the kinetic energy of motion of the bodies. Let us once again emphasize that for such conversion of the potential energy of electrical field and charges into the kinetic work of the bodies we will need only one electrical potential. That is why this type of energy is called *Electropotential Energy*.

EXAMPLES OF CONVERTION OF THE POTENTIAL ENERGY OF ELECTRICAL FIELD INTO KINETIC ENERGY

It is traditionally accepted that doing useful work requires much energy. In particular, all the modern engines (both heat and electric) still have high energy expenditure (they consume much heat and electrical energy while their output is at most 30%).

The development of energy storage devices is one of the key open problems of the day. It has to do, for example, with making efficient electrical vehicles that could run long distances without frequent recharge of their storage batteries. But there is another possible solution for the engines, which consists in using the potential energy of electrical field and powerful Coulomb forces.

The author of this article presents new methods to convert the potential energy of electrical field into other forms of energy and uses them to design ordinary electropotential motors, which output is over 90% [1].

The design of the motors contains an electrical field source (e.g. a high-voltage changer or a no-current source of electrical field – an electret, an oscillatory circuit (of various types) and at least one energy storage device) [1].

In Fig. 1 you can see the simplest model of an electropotential motor of oscillatory type with opposing springs. This device demonstrates the principle of converting the potential energy of electrical field into work by means of Coulomb forces of repulsion.

We supply a high electrical potential (roughly 20kV) from an electrical field source (1) to two tightly fastened plates (3, 4) (Fig.1). Practically immediately the plates 3 and 4 get like charges and then Coulomb forces make them repulse one from another. After that the plates start moving apart rapidly till they touch charge-collecting pins (9).

...there is another possible solution for the engines, which consists in using the potential energy of electrical field and powerful Coulomb forces.

At the same time springs (5, 6) contract and thereby acquire the potential energy of contraction. Coulomb forces vanish at the moment when the plates are discharging to the charge-collecting pins (9) that are mounted on an earthing platform (10). The contracted springs push the plates back from the reversal points (3-1 and 4-1) to the initial position till the moment of their contact. Then we repeat the procedure. Let us mention that to actuate this reciprocating electrical motor with low energy expenditure we will need just one electrical potential. The electrical charge of the plates (3, 4) needs constant renewing, though Coulomb forces in the motor are rather high even at minimal electrical charging rate of the plates. However, it is possible to make the design even more economical. For that we can either recuperate the given total charge back to the plates (3, 4) or to shield the charges while they return to the plates. For example, the plates (3, 4) made of electrets can be shielded at their return motion.

So while the plates are moving back to their initial position, for example, under the action of the contracted spring, such shielded charges will not impede their return. As the given bodies (plates) come together, the shield must be taken off one more time and the like charged bodies will repulse each other again.

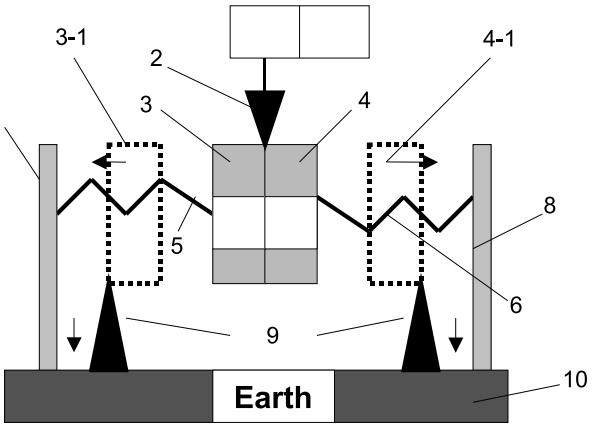

Fig. 1

The simplest electropotential motor with return springs

1 – high voltage source; 2 – conducting current collector (spike); 3 – conducting plate (3-1 – return point); 4 – conducting plate (4-1 – return point); 5 – spring (insulated from the plate); 6 – spring (insulated from the plate); 7 – left stop of the spring; 8 – right stop of the spring; 9 – charge-collecting devices (pins); 10 – earth.

Once induced electrical charges of the bodies can be repeatedly used to set them in return motion. That is why the electropotential mechanics is very economical.

Totally no-current "perpetual" electrical motor of electret-mechanical type with blinds

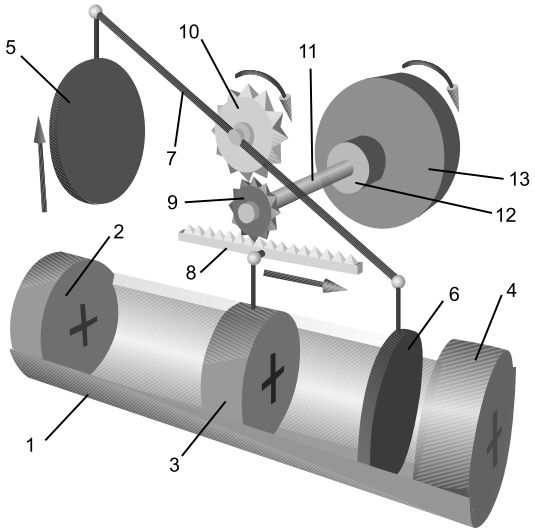

Fig. 2

Perpetual mobile using the potential energy of electrical field

The electrical motor (Fig.2) consists of a case (1) with two stationary stator electrets (2, 4), which are fixed on the ends of the case, as well as of a moving electret rotor (3), which is supplied with lifting mechanisms (8-10) and two shielding blinds (5, 6). The electret rotor (3) oscillates between the stationary electrets (2) and (4).

In Fig.2 you can see that the electret (3), being under the action of electrical repulsive forces, moves from the electret (2) to the stationary electret (4), which is shielded by a blind. At the same time the blind (5) starts going down with a rocker (7) driven by gears (8, 9, 10) and thereby shields the electret (2). The shielding blind (6), on the contrary, goes up and open the second stationary electret (4). The electret rotor (3) stops and, in consequence of the electrical repulsive forces of the electrets (3) and (4), starts its return motion to the electret (2). Then the cycle of movement of the rotor is automatically repeated. As a matter of fact, the given device is a "perpetual" oscillatory electrical motor that uses the potential energy of the electrical field of the electrets (2), (3) and (4) and the electrical forces of repulsion of like charges, i.e. Coulomb forces.

"Perpetual" reciprocal electret motor with self-oscillating electromagnetic circuit

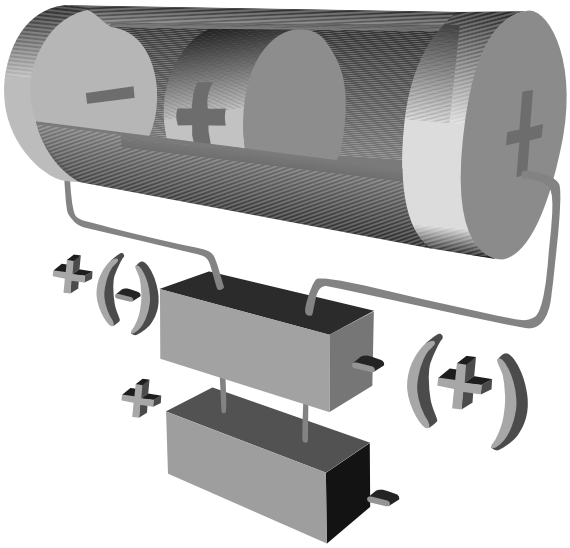

Fig. 3

Design of the electrical motor

Fig. 3 shows design of such a motor. It includes a free-running piston-rotor, which is made of a charged monoelectret. Inside of a hollow chamber there are disks of an electrical

condenser. The chamber has the form of a hollow cylinder. The disks of the electrical air condenser are mounted on the inner butt-ends of the cylinder (Fig.3). These conductive disks are connected electrically to the terminals of a high-voltage changer with adjustable amplitude and frequency (a voltage inverter). An electrical inductance is connected in parallel to the terminals of the disks (Fig.4). The electrical condenser (capacitance) inside the motor and the mentioned inductance form an electromagnetic oscillatory circuit. Generative inductance can be coiled onto the given cylindrical chamber that is permeable to the magnetic field.

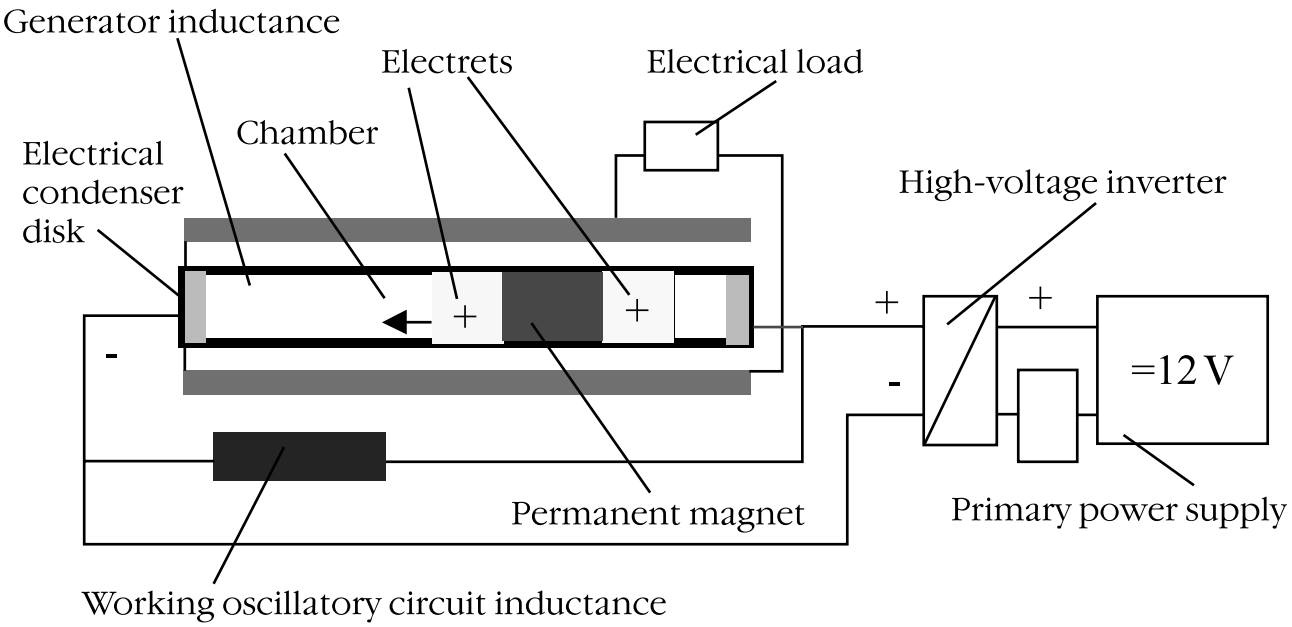

Fig. 4

As a matter of fact the proposed design is an original electromechanical oscillatory system that combines a resonance electromagnetic oscillatory circuit and an electret mechanical oscillatory circuit. The principle of operation of this reciprocating (oscillatory) motor consists in cycle polarity changing of the electrical charge on the disks of this inner condenser.

As a result of the action of powerful Coulomb forces the electret rotor accelerates and starts moving inside the chamber towards an unlike charged disk.

When voltage sign and the charge of the disks change, it starts moving with acceleration to the opposite electrode. Let us note that as the electret accelerates in the chamber, an emf arises inside the inductance coil.This emf automatically changes the polarity on the condenser disks. Consequently, when the electret rotor approaches an unlike charged electrode, at first it decelerates.

Then, at the moment when the charge of the electrode changes its polarity to the opposite one, the rotor starts moving to the opposite electrode inside the chamber. The repulsive force (acceleration) of the electret rotor and the frequency of its oscillations between the condenser disks depends on the charge of the electret rotor and on value of the high voltage initially supplied to the disks, as well as on the parameters of the oscillatory circuit. Since the electrical currents in the circuit are low and as the condenser and the inductance interchange their energy, then the energy loss is also very low and the performance index of this device that converts energy of electrical field into propulsion and electrical power is close to 1.

The output can be even more than 1 if only the power line supply but not the energy of electrical field is regarded as the electrical power input.

Hybrid electrostatic motor-generators (Fig. 5, 6)

It is astonishing, but using the potential energy of electrical field we can generate both kinds of energy at the same time (both kinetic energy of motion, e.g. energy of rotation, and concurrently electrical energy). The amount of the kinetic energy and electrical energy, which are generated in the load from the potential energy

of electrical field, is regulated by changing the intensity of initial or induced electrical field and the amount of charge. Let us consider some devices of the kind.

Electret motor-generator of rotary type

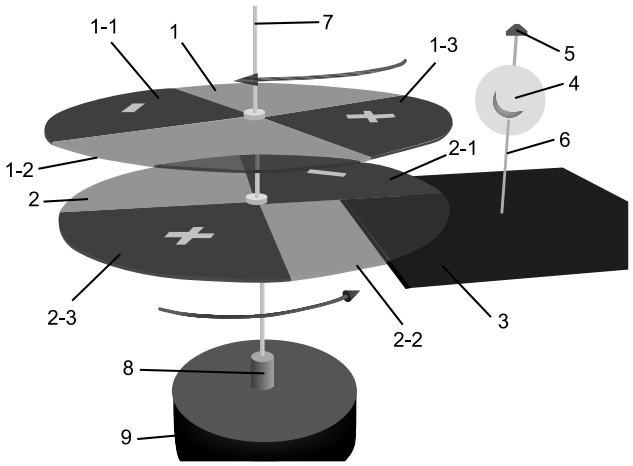

Fig. 5

In Fig. 5 you can see even more original variant of the "perpetual" rotational electret motor-generator created by the author. The design of such an unusual generator comprises two (or more) paired segmental electret disks of free rotation (1), (2) and two (or more) charge-collecting plates (3) that are positioned parallel to these disks at a minimal gap. To start the generator it will suffice to begin rotating the disks in the opposite directions.

For the sake of simplicity the second charge-collecting plate with electrical load is not shown in the picture. An analogous device has been already functioning in France and there is an article describing it [6]. Unlike its analogue [6], this electrostatic generator is made of more advanced high-performance electret materials and has a considerably improved design. Thanks to high electrical intensity and charge density of the electret, the capacity of this generator increases in many times comparing to the device [6] with similar speed of rotation and dimensions.

After forced spinup of the disks (1) and (2) to the opposite directions, these segmental electret disks go on rotating spontaneously. It results from power interaction of electrical charges of the electrets between the disks. The electrical field induces an emf onto a stationary flat electrode (3). The speed of rotation is determined by the proportion of the design factors of the device and the parameters of the electrets. The emf of generated voltage is proportionate to the speed of rotation of the disks and to the number of segments of the electrets. As a result of rotation of the disks and changes in the electrical field intensity, unlike electrical charges are cyclically induced on the electrode (3) and AC electrical power is generated in the load (4). Fig. 5 shows the electrical load that has the form of a glowing bulb (4) and is connected into the circuit "electrode (3) – electrical load – earth"

Motor-generator set of linear-rotary type

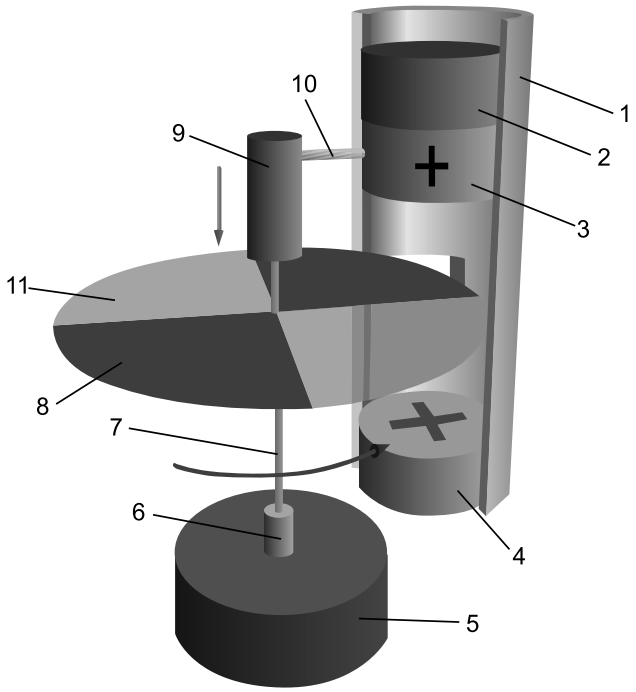

Fig. 6

In Fig.6 you can see a simplest multifunctional "perpetual" motor generator. It consists of a rotating segmental electret disk (8, 10) and two electrets (3, 4), which are mounted in a vertical shaft (1). When the stationary electret (4) repulses the moving electret (3), the latest starts moving back and forth. Thereby it provides continuous rotation of the segmental electret disk (8, 10) using a transmission gear (9) that reminds a children's toy – whirligig. Rotation of the electret disk results in an emf of electrical induction and electrical energy generation.

The generator circuit is similar to the circuit in Fig. 5, therefore it is not shown here. By changing parameters of the device and parameters of the initial electrical field we can regulate the parameters of moving electrets,

which are generated by the electrical field, as well as the amount of kinetic energy of motion of these bodies. The devices (Fig.5, 6) have been tested in working models and have proved their efficiency.

In Fig.7 you can see a variant of the design of low expenditure electrofield motors as applied to electric vehicles. A crank gear converts the kinetic energy of back-and-forth motion of the electrical (or electret) rotor of this unusual low expenditure electrofield motor into ordinary rotation of a distribution crankshaft of an electric vehicle.

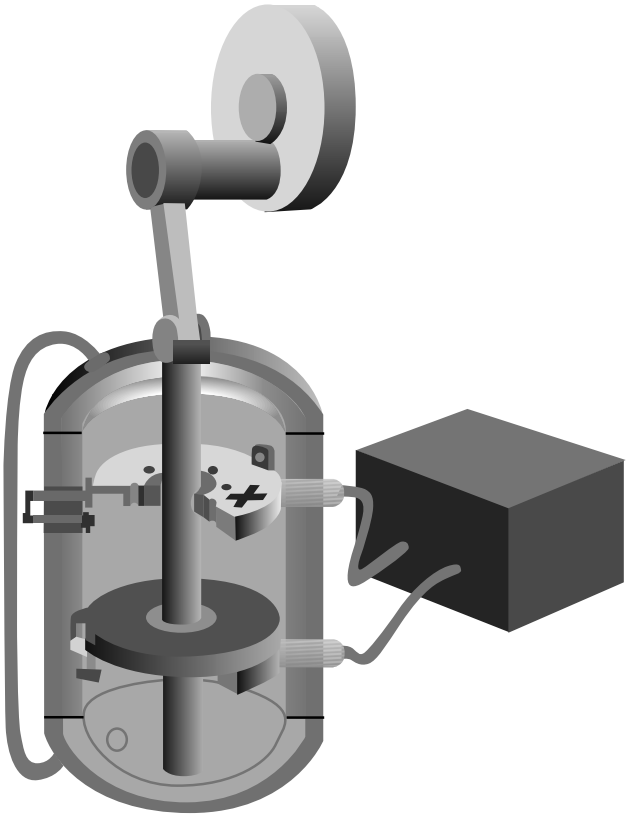

Fig.7

Electrofield engine

The work chamber and contacting parts of the mechanism (e.g. its rod) are insulated with special metal-ceramics. In order to prevent draining of electrical charges from working plates of the electrical condenser we should regulate the propulsion, torque of the shaft and rpm of this electromotor not by increasing electrical current (like in ordinary electrical motors), but by changing voltage of the power source and, as a consequence, by changing the amount of electrical charge on the plates of the electrical condenser with constant polarity. In order to increase the dielectric rigidity of the work chamber of this low expenditure electropotential motor, we fill the chamber with insulating gas, which has extremely low viscosity.

At the website http://www.dud-epd.narod.ru you can see an animation film that demonstrates the operation of this original low expenditure electromotor (Fig. 7).

EXAMPLES OF OTHER EFFICIENT DEVICES OF LOW EXPENDITURE ELECTROFIELD POWER ENGINEERING

In his previous articles [3-5] the author proposed and described new technologies of application of potential energy of electrical field, in particular, the technology for pollution-free combustion devices, fuelless orbit cosmonautics and the low expenditure technology of hydrogen generation from water.

Above in this article we have already mentioned a number of efficient methods and devices for generation of kinetic energy of motion and electrical energy.

Let us cite some other examples of the simplest efficient devices of this new electrofield mechanics. Potent Coulomb forces of repulsion of like charged bodies can be successfully applied in the nearest future, e.g. to bearings.

Perpetual contactless electret bearings

Bearings are a base and a movable support of all moving and rotating devices. However mechanical bearings are wearing parts and not reliable enough in service, for they require regular control and maintenance (lubrication), besides, their service life is limited.

Levitation of bodies in electrostatic field

Coulomb forces of repulsion of like charges can be applied to bearings of new a generation. The author presents a new type of contactless bearings. It is made on the base of electrostatic (electret) suspension of the inner and outer rings of a bearing.

There can be many variants of such contactless levitation (suspension) using Coulomb forces. The simplest way to realize it is either to use triboelectric effect or to apply new polymeric

materials i.e. monoelectrets [3]. Electrets have been serially produced since long ago. Electrets are manufactured in the form of a thin polymeric film with an electrical charge of certain density "trapped" into it. The charge can be stored in the film for arbitrary long time.

Currently electret film is widely used in microphones and telephones. But it can be used for electrostatic suspension of bodies as well. In particular, it will be expedient to apply this film to our new type of "perpetual" contactless electrostatic bearings.

Electrical repulsion force in such a bearing is millions of times more potent than magnetic repulsive force in a magnet bearing of the same dimensions and same masses of charge carriers. These contactless electret bearings are the future.

In Fig.8 you can see a contactless support electrodynamic suspension of bodies. It is based on the principle of repulsion of two no-current sources of electrical field (electrets) that are tightly connected with levitated bodies.

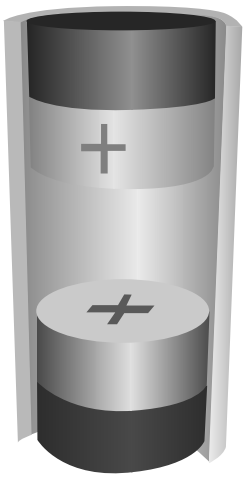

Fig.8

Fig.9 shows a "perpetual" contactless electret bearing of rotary type. The work surfaces of grooves (3, 5) and balls (4) have electret covering. The electret bearings are highly resistant to dynamic stress thanks to their special sulcate design and small gaps.

The design of this rotary bearing is rather simple: in order to provide such electrostatic levitation of the rings one inside another it is enough to cover its work surfaces with an electret film. As a result a contactless rotary bearing (CLRB) with such electret films is able to bear dynamical stress up to 2-3 tons.

These films are sprayed onto the inner surface of the groove of the outer bearing ring and onto outer surface of the inner ring with just a 1 mm gap. The author has carried out electromechanical simulator study of the CLRB using special PC program and test operation.

It has been proved that the application of modern electret materials for CLRBs provides their safe performance at much higher dynamic stresses comparing to ordinary mechanical bearings of the same dimensions.

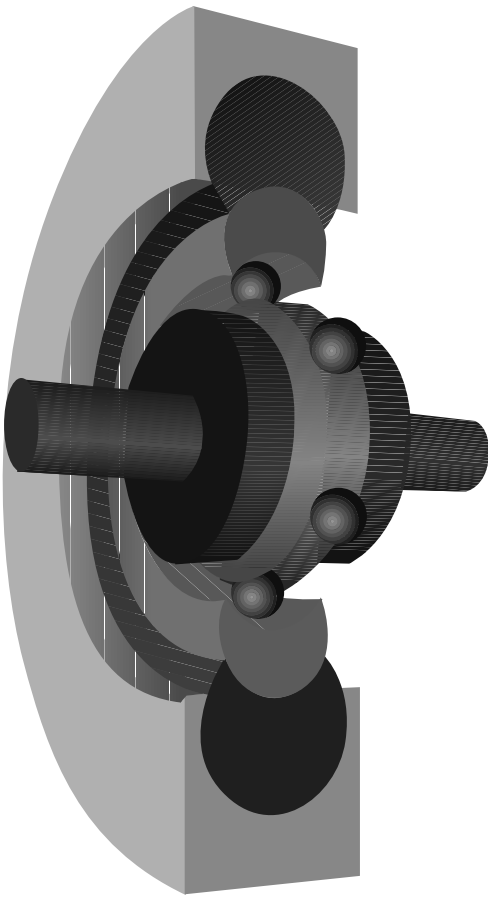

Fig.9

Contactless electret bearing

Electrostatic accelerators of solids and liquids

Potent Coulomb forces can efficiently accelerate solids and liquids in one direction. The author has already tested in practice such physical effects of this low expenditure

process of electrical acceleration of bodies in electrical field.

In Fig.10 you can see a simple experimental device that is used to generate an electrically charged jet of potential energy of electrical field. Power inputs for generation of such an electrical jet are just 5-10 W at the speed 50-100 m/c. The experiment is described below.

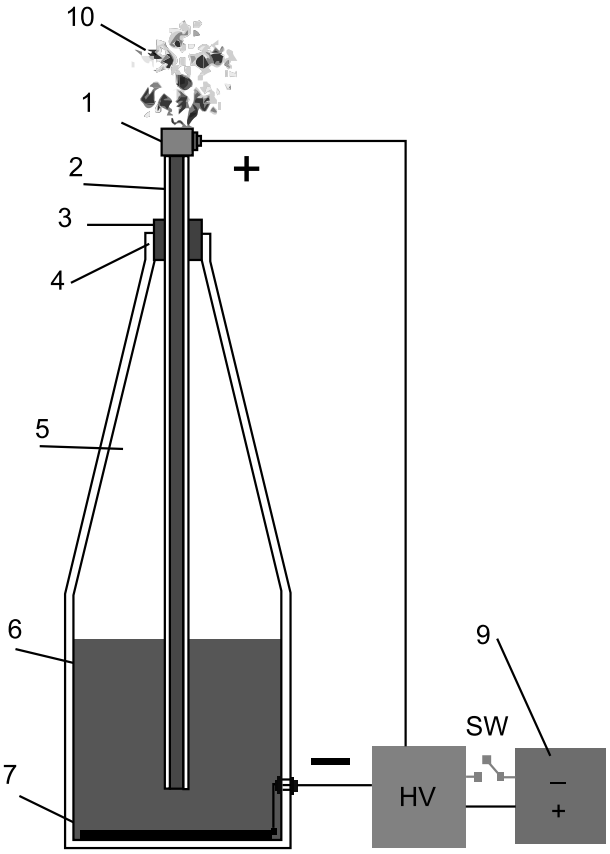

Fig.10

Electrical water jet

1 – positive electrode; 2 – glass tube; 3 – rubber plug; 4 – glass vessel; 5 – air; 6 – water or other liquid; 7 – negative electrode; 8 – high voltage changer; 9 – storage battery.

Experiments on electrical acceleration of liquids in capillaries by means of a pulse

The author of this article revealed and experimentally studied the effect of high acceleration (ejection) of dielectric liquids in capillaries under the action of Coulomb forces in a strong electrical field (about 10-20 kW). The technical realization of the method is rather simple and can be as follows: a dielectric liquid (e.g. diesel oil) is poured to a tube of small diameter (about 1-3 mm) and a strong electrical field is supplied to it instantaneously. The liquid ejects from the tube with acceleration. Two electrodes of a low-power voltage changer generate an electric filed in the column of initially motionless liquid. The electrical field arises in a certain direction depending on the polarity of an electrical potential inside the liquid.

The effect of acceleration of the liquid is most pronounced (evident) when one of electrical potentials is supplied into the liquid itself that is poured in a bent tube and another potential is located at a certain distance from the cut of a tube. The nature and principle of operation of such an electrical liquid accelerator are clear enough. Under the action of even one electrical field potential in dielectric liquid, all the liquid gets an electrical charge of a certain polarity. Molecules and clusters of the liquid become polarized and long chains of interconnected and polarized molecules are formed. When the second potential is supplied to the cut of the tube, there arises potent electrostatic energy of the attraction between these molecular chains and an outer electrical potential (ring electrode).

In order to raise the pressure in the tube electrical field should be supplied to the liquid instantaneously at the moment of ejection. To increase the intensity of acceleration of the liquid jet it is expedient to take off field potentials right at the moment of ejection.

Pressure measurement of the liquid shows that when the electric filed is supplied instantaneously to the liquid, the pressure on the cut of the tube rises (roughly 10-50 atmospheres) at the moment of jet detachment and the speed is about 100 m/c depending on applied high voltage (10-35 kW). When this occurs the energy inputs for polarization and acceleration are insignificant. It could be explained by the fact that in this case there is no current circuit of discharge of voltage supply.

(To our mind, the mentioned method can be successfully applied to ordinary contactless fuel electrostatic high-pressure pumps, e.g. in automobile injection motors).

We could continue citing examples of efficient electrofield devices that could be built on the base of the author's inventions, if we were not limited by the frames of this article.

Constructive responses to this publication will be greatly appreciated. The author is also interested in comprehensive creative discussion of his article and in mutually beneficial cooperation with companies that would put his numerous new technologies and devices into practice.

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News Review

Fuel energy companies invest money in alternative power engineering

http://www.eco.com.ua/cgi-bin/index.cgi?id=1577

http://www.shell.com/home/Framework?siteId=hydrogen-en

The giant British-Dutch oil company Royal Dutch/Shell Group has announced its intention to put annually from 500 million to one milliard US dollars into alternative power engineering. Shell Group has already founded an independent company that specializes in hydrogen technologies. As a number of other oil giants, Shell is getting ready in advance for hard times when exploitation and extraction of hydrocarbon raw materials will make no commercial profit. One of the latest projects of Shell in the field of hydrogen power engineering is the first hydrogen refuelling station in Tokyo that provides special transport with liquid hydrogen. The practical realization of the project belongs to Showa Shell Seikyu KK (Show Shell), which is a Japanese company 50 per cent owned by the Royal Dutch/Shell Group of Companies (Shell).

The concern British Petroleum, London competitor of Shell, is also interested in problems of alternative power engineering as well. As soon as by 2007 BP expects to get no less than 1 milliard dollars from selling electrical energy generated by solar cells. Companies engaged in motorcar industry have their developments in this sphere as well. In 2003 the Japanese company Honda Motor starts line production of FCX-V4, a hydrogen cell-powered vehicle. However the company prefers not to enter into a partnership with other companies that have a concern in industrial application of hydrogen fuel and plans to begin mass production of pollution-free motor vehicles no sooner than in 2015 for the new technology is still very expensive.

It is evident that transnational corporations do not want to lose their control over the world economy. Foreseeing a collapse of the traditional system of energy carriers and a changeover to alternative energy sources, fuel and motorcar industries appropriate promising developments, attract necessary specialists into their laboratories and form packages of patents for key technologies ahead of time. One may expect that the development of alternative power engineering will accelerate thanks to efforts of large manufacturers.

Air Energy

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Air is considered to be one of the alternative sources of energy. As a rule, the energy of air flows is meant here. Meanwhile as everybody knows from the molecular-kinetic theory of gases the molecules of air move at speed 500 m/sec (no matter what the speed of an air flow is). The weight of one cubic meter of air is over 1 kg. It is easy to calculate that the Earth's atmosphere contains huge amount of energy. Usually methods of using this energy are not discussed. Molecules move in the air absolutely chaotically and, as is the convention, in such a medium the energy can be only absorbed or dissipated and this process is irreversible. Indeed, within the usual frames of space and time the molecules move quite chaotically, their quantity is tremendous and the process that is accompanied by the increase of entropy is most possible. Nevertheless, the motion of a molecule in the interval between collisions seems to be ordered and predictable. The average distance that a molecule passes within this time is dozens of nanometers. Lately appeared nanotechnologies enable to manipulate the matter at this level. Let us try to take advantage of it.

Let us take a plate both surfaces of which are absolutely smooth and have surface areas S_1 and S_2 (Fig.1a). Both sides of the plate are under the action of forces. The forces are normally directed to the plate and numerically equal to total pulses. These pulses are imparted to the each side by the colliding molecules of air. As the total pulses are in proportion to the surface areas of the sides and $S_1=S_2$, then $F_1=F_2$.

Let us assume that side 1 of the plate is not absolutely smooth surface. Let it be somehow relief (e.g. riffled, see Fig.1b). The contact area of the plate with air from side 1 enlarges. Correspondingly, the number of collisions against side 1 increases. However the balance of forces F_1 and F_2 is not upset.

In order to explain this phenomenon let us divide the plate into a great number of equal elements and consider one of them (Fig.1c). For the sake of simplicity hereinafter we will use some of the terms, which are accepted in geodesy.

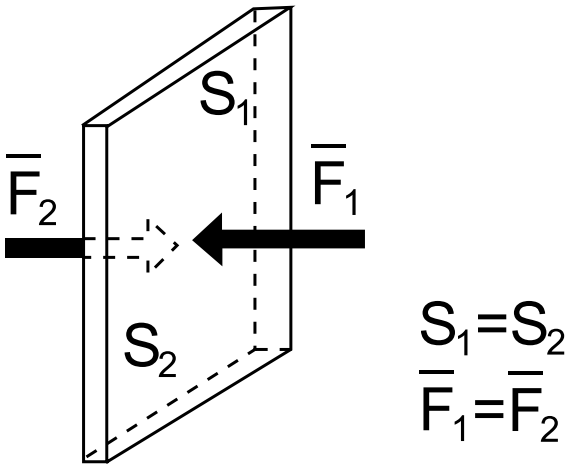


Fig. 1a

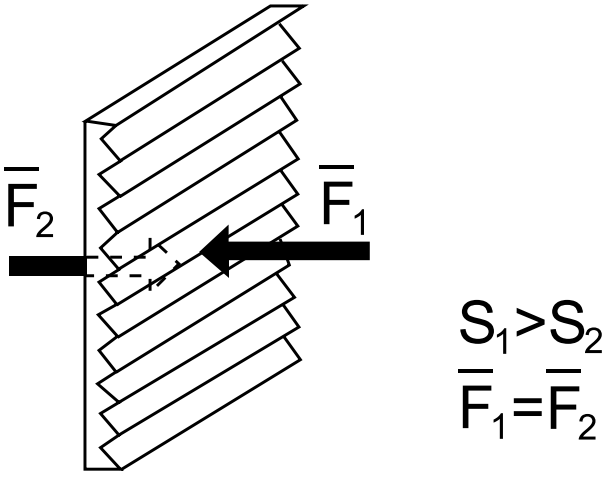
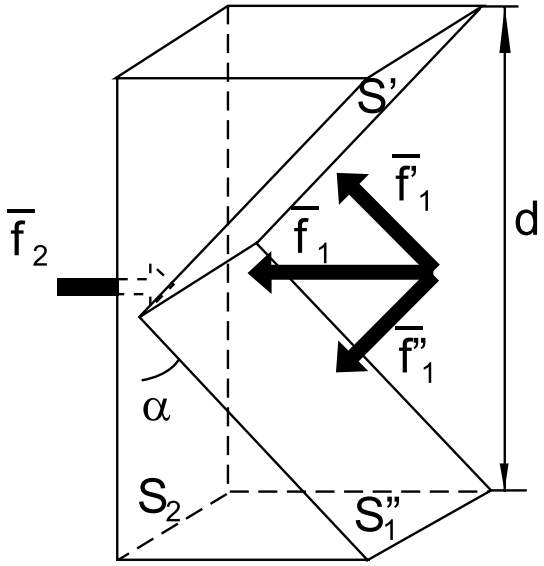


Fig. 1b

Let us designate the following: slope angle is **a**, distance between the peaks is **d**, surface area of the slopes is $\mathbf{S'_1}$ and $\mathbf{S''_1}$ (side 1) and surface area of the element is $\mathbf{S_2}$ (side 2). The picture and the given proportions show that as the surface area of the plate from the side 1 extends and as the number of collisions against this side increases, so the absolute sum value of the forces acting from side 1 grows as well. However the vector sum remains normally directed to the plate (later on to the 'background' surface) and equal to the force which acts from side 2.



$$S'_1 + S''_1 = \frac{S_2}{\cos\alpha} > S_2$$

$$|\bar{f}'_1| + |\bar{f}''_1| = \frac{|\bar{f}_2|}{\cos\alpha} > |\bar{f}_2|$$

$$\bar{f}_1 = \bar{f}'_1 + \bar{f}''_1 = (|\bar{f}'_1| + |\bar{f}''_1|)\cos\alpha = \bar{f}_2$$

Fig. 1c

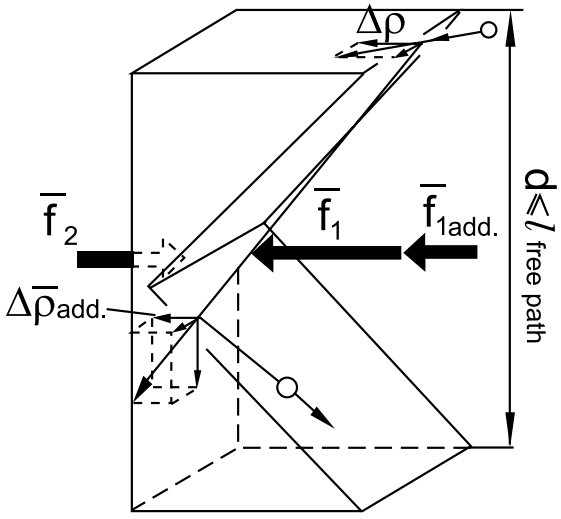
If the collisions of the molecules and the plate were absolutely inelastic, then the given balance would be invariable for all shapes and sizes of the relief, because any of the elementary surfaces of relief (being oriented at some angle to the background surface) in direction, which is normal to the background surface, is under the action of a force, which is equal to the force that acts on the background surface. However the collisions of the molecules and the plate are elastic. Therefore if the relief of the surface is small enough (in this particular case, when **d** is less than the average length of one free path of the molecule *l*) then there is arises a factor, which upsets the mentioned balance of the forces (Fig.1d).

When d >*l* of free path, on colliding with the plate each of the molecules goes back to its original medium. But when d ≤ *l* of free path some of the molecules will hit the plate more than once before they return to their medium.

Thereby the plate gets additional pulses. The resolution of their sum vector will give a non-zero component that is normal to the background surface. Hence on side 1 there appears an additional force and the balance of forces is upset.

The effect shows up on the elements of surface where the relief has the profile of a cavity and the distance between the slopes is ≤ *l* of free path in any of the directions. The effect is a maximum where the surface profile has similar parameters in all the directions, i.e. where it has the shape of a funnel or a crater.

A plate one side of which is "sown" with such craters can be used in energy generation devices. Normal air pressure is 10^5 N/m^2 and pressure difference of 1 % is already quite considerable. Preliminary and very rough calculations show that the pressure difference can be dozens of percents though.



$$\bar{f}_1 = \bar{f}_2 = \frac{\Delta\bar{\rho}}{\Delta t}$$

$$\bar{f}_{1add.} = \frac{\Delta\bar{\rho}_{add.}}{\Delta t}$$

Fig. 1d

A Parade of Gravitational Aircrafts

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Gravitational Aircrafts are aircrafts that use gravitation forces for movement in space and consist of two interattracting masses. This definition reflects a fixed scientific notion for that type of apparatus. But in different publications the term "gravitational aircraft" is usually regarded in general, namely as *a device that controls gravitation by any manner.*

There are two complementary, but not quite interchangeable common explanations of gravitation, plus a multitude of alternative and little-known interpretations that are not in question here. Isaac Newton, the first physicist, described gravitation as attraction between two masses. The principle of relativity of Einstein General Theory presumes that in fact a mass causes space-time deformation around it. The both theories explain why material bodies fall to the Earth.

Scientists regard Einstein Theory as being more comprehensive, since it also explains why the light (which is weightless) deviates in strong gravitational fields. Such a view on gravitation makes of it something more than just a characteristic of the Universe. For that reason many scientists consider the idea of creation of any antigravitational devices as nonsense. Many of them, but not all!

Gravitational propulsion devices

If the densities of two attracting bodies differ significantly one from another, then the entire system of two mechanically connected masses will start moving towards the body with higher density. G.R. Uspensky (Central Scientific-Research Institute of Engineering, Cosmonautics Faculty of Moscow Aeronautical Institute) succeeded in making the most accurate calculations of the effects arising from this phenomenon.

The scientist published results of his calculations and they rouse no censure of the specialists. G.R. Uspensky created his own theory and designed his own gravitational aircraft.

During the flight of a solar probe near the Sun the researcher planned to define more precisely some aspects of the gravitation theory in order to test the efficiency of gravitational propulsion devices. According to him, in the end of 2001 there were obtained most encouraging results!..

Valeriy Akinin, mechanical engineer and Member of the Academy of Inventors, Men of Arts and Science, proposes to develop a so-called "dumbbell" gravitational aircraft. Let us assume that there is a system of two equal weights with a horizontally oriented rigid connection between them.

If the weights are moved apart to a larger distance than the initial one, the whole construction will... lose its weight! This fact has been already known before.

Akinin offered not to set the weights apart, but to rotate the construction around a horizontal axis mounted transversely to the connection. So the projections of separate gravitational forces to the axis of the system will change in a proper way, just as it is required in fact. Theoretically, as the weights we can imagine atomic nuclei, electrons and so on.

However, apart from the classic "two-mass" gravitational aircraft there is a great number of other projects, starting from devices that "generate gravitational waves using heat flow" (A. Scheglov) up to black holes harnessed with a special torus-shaped bridle (Kazykin (Kaluga), I. Ivanchenko).

Magnetic gravitational aircrafts

Magnetic gravitational aircrafts are apparatus in which, according to the authors, propulsion or gravitation control is achieved due to peculiar manipulations with magnetic field.

For example, such projects have been proposed by G. Bowhon, G. Johnson (USA) and by Robert Adams together with G. Aspden (Great Britain). V.V. Mironov, Director General of "New Civilisation" Co Ltd, has been working at creation of a gravitational engine made of heterogeneous metals with a "Veinik ring" at its heart.

The aim is to find a way of controlling gravitational field near the Earth and other cosmic bodies.

The American researcher Benneth suggested to get propulsion by means of interaction of electromagnetic and gravitational fields. Though at first sight the idea seems to be unrealisable, nevertheless the author obtained two patents for this project at once.

As successful experiments of the kind we can cite experiments on "reveal of abnormal weight loss of the falling magnets" by a physicist Kelly.

Electric gravitational aircrafts

Electric gravitational aircrafts are devices in which, according to the authors, propulsion or gravitation control results from peculiar manipulations with electromagnetic field.

Physicists V.V. Vasilyev and V.Y. Vasilyev (Obninsk Nuclear Power Institute) suppose that gravitation can be controled by means of resonant interaction of millimetric electromagnetic waves. Dr. Robert Hatchings Goddard, one of the founders of cosmonautics, projected electric gravitational engines as well and in 1920 he was even given a priority for one of the engines.

Among successful experiments there are known ones on "abnormal deweighing of electromagnetic coils" by Japanese physicist Yonomata.

Several trustworthy experiments, at which the author of this review assisted, were made by E.D. Pronin (ex-employee of "Energia" Research-and-Production Co) and by physicists S.M. Polyakov and O.S. Polyakov (Fryazino, Moscow Region).

There was obtained a small level of propulsion in these experiments. The author of the present review participated in the experiments, took appropriate measurements and a video record and drew up his own report on physical nature of the propulsion.

I.M. Shakhparonov (ex-employee of Kurchatov Institute) has been also preparing similar experiments. The scientist has already created a generator of Kozyrev-Dirak Radiation. Moreover, he has analysed consequences of the influence of the generator on the matter as well as its capability to generate gravitational waves.

Shielding gravitational aircraft

A protection shield that transmits gravitational waves completely or partially, to some physicists' mind, could facilitate reaching an uncompensated moment and making propulsion for flight.

The Corpuscular Theory of Matter and some other theories presume the possibility of finding methods of gravitation shielding or changing its character (repulsion instead of attraction).

It is beyond question that in case of complete gravitation shielding in one direction the attraction of even very distant stars will inevitably make a spaceship fly in the opposite direction. The following research works can be marked out among the projects of the kind.

In 1996 engineers A.V. Murlykin and S.A. Mikhalev (MAI, "Amur" Co) proposed an idea, which supposedly provided partial shielding of the weight of a device. It was expected that a material of a certain density could partially shield the weight of another material of a different density.

To prove this effect mechanical engineer N. Sorokin (MAI) made two metal samples, each of them had high density and weighed 1 gram. The samples were shaped as a shell with well-adjusted walls and there was a ball enclosed inside.

At Zigel Scientific Conference in Moscow S. Mikhalev announced that he would demonstrate "a proof of flight of the flying saucer". He made a report and only then he demonstrated two balls and promised that two of his tests (the first one – exact weighing of the separate balls, the second – exact weighing of

the balls when one was inserted into the other) would reveal the difference in weight... However the experiment showed no impressive effect.

What is especially popular among theoreticians of the gravitational aircrafts, it is not Newtonian Law of Attraction, but the Law of Repulsion, according to which material bodies are pressed to the planets under influence of the total repulsive force coming from that part of the Universe which is not screened by a planet or another shield.

Antigravitational aircrafts

In 1991 R. Forward (USA, "Nullor" Project) presented the best description of the mode of functioning of gravitational aircrafts. Imagine two huge massive rings (from 97 to 970 m across diameter) and between them in open space there is cargo bay of useful load.

The upper ring is made of ordinary superdense material and attracts both the cargo bay and the lower ring, while the lower ring repulses both the cargo bay and the upper ring.

At the same time the entire system is to accelerate in one direction and the acceleration is controlled by a simple change of the distance between the rings.However there is an impediment – the lower ring is to be made of hypothetical antimatter. It is not clear how such a giant ring can be produced of antimatter.

Another big problem is the hazard of contact of the two rings. It may result in a very powerful explosion or (if the annihilation of the solid bodies is far from being so catastrophic as, for instance, in case of gas clouds) microexplosions on the contact area. The explosions will destroy the rings and push them apart.

There are less hazardous projects, which in fact sound even more hypothetical. In the early 90s E. Linevich, inventor and ex-employee of an aircraft repair and overhaul plant, applied for about 50 patents, including an application for a gravitational inertial engine.

All his projects were rejected "because of violation of the known laws of Nature". In 1991 in his work "Antigravitational phenomenon of physical bodies" Linevich proposed a project of a magnetoelectrical propulsion system for spacecrafts that is able to run on nuclear industry wastes.

He designed "an experimental device for studying antigravitational phenomena" and in 1991-1993 it was being built at "Askold" plant in Arsenyev. E. Linevich did not open any details of his invention. Unfortunately production of the device was not completed for in 1999 the author emigrated to the USA.

Engineer Evgeny D. Pronin, former designer of radio systems for "Energia" Research-and-Production Corp. who has become a violinmaker, has been working at designing an antigravitational radiator since the beginning of the 90s. Evgeny D. Pronin has the richest experience in designing most sophisticated radio systems.

It was him who made one of the first TV sets in Moscow, but since the 80s he turned into an ideological antagonist of using the radio waves "for the reason of ecology" and that was why he took up working in the field of gravitation.

According to Pronin, he succeeded to create his own project of a gravitational motor-radiator, a certain "gun" that is able to remotely reduce the weight of bodies.

A. Dobrogaev, one of the experts of Kosmopoisk, assisted at testing the antigravitational radiator and confirmed that the irradiated bodies did lose their weight, though he doubted that it was a fair experiment.

In 1993 a member of French Entomological Society V.S. Grebennikov (Krasnoobsk, Novosibirsk Region) announced successful testing of his antigravitational propulsor. According to a number of publications, he made several piloted flights aboard a levitating platform. *(Editor's: We also wrote about the investigation of this scientist more than once).*

The entomologist studied the bodies of insects and discovered the effect of cavity structures. Since 1988 he had been working at disclosure of the principle of flight of a maybug and noticed that many of the chitin shells of the insect had rhythmic microstructures and volumetric microtraceries. To Grebennikov's mind, the effect of their structures provided levitation ability of the insect's body.

Later he put forward an idea of making a gravitational propulsor on the base of the discovered maybug secrets. He built a wooden platform of about 0.5 x 0.5 m in size with a substrate of the "maybug material", a control panel and a handle.

According to Grebennikov, on the night of March 18, 1990 he successfully tested his antigravitational platform with the mentioned propulsor and realized an independent piloted flight aboard the levitating platform from Krasnoobsk to Academgorodok, then he went to Severo-Chemskoy district and - across Zatulinka district - to Tolmachevo Airport and finely went back to Krasnoobsk.

Afterwards his article "Night Flight Aboard a Gravitational Aircraft" was reprinted from the local newspaper by "Technology to the Youth" magazine and then some other periodicals cited the article many times.

However when the author of this review got in touch with the inventor, the later could not confirm that information. Since the moment of the publication in 1993 V. Grebennikov had been extremely suspicious towards everybody who took an interest in his inventions.

The scientist did not want to cooperate with manufacturers nor sponsors under the pretence that only one threatened species of insects showed that discovered antigravitational ability. In this connection Grebennikov was worried about the destiny of those insects in case if their secret would be disclosed. As a whole the invention of Grebennikov makes the impression of a low-grade disinformation.

Meanwhile engineer M. Holverda and Japanese physicists T. Hashida and H. Tanaka together with H. Hayasaku are trying to prove the antigravitation phenomenon in laboratory environment.

Gravitorepulsive shields

One more type of the aircrafts gets propulsion by means of shielding pressure forces in some directions. A.K. Titarenko (Moscow Institute of Aviation) worked at this problem in the early 90s. But the work remained uncompleted for in 1993 A.K. Titarenko was killed.

In the 80-90s B.P. Dodonov, physicist and inventor, carried out experiments on the creation of heliciform stators and he managed to build several devices with helical and direct shields. They were up to 6 m across diameter and made of wood or metal. Dodonov even got a patent for creation of such a propulsor (patent #2005505, 1991 for "a propulsor that uses space power").

After the inventor's death in 1998 his successors and colleagues began using Dodonov's devices named "Corbio" for medical purposes and did rather successfully.

Many times the author of this review participated in person in preparing B. Dodonov's experiments and he made certain that the suspended rotors inside Dodonov's stators though slowly, but did begin rotating.

As for the explanation of this effect (Dodonov expected his experiments with a heliciform shield–stator to demonstrate "Newtonian repulsion") yet the real reason is not quite understood.

So far only one possible application of the effect is more or less obvious. The phenomenon is of little use for providing propulsion for aircrafts because the stator is too heavy (light-weighted stators are inefficient), but it can be used in power plants (in view of the heavy weight of the stator such plants could be stationary).

It should be noticed that the projects mentioned above use repulsive forces (for instance, repulsive forces of aether wind), but not the forces of antigravitation.

"Good morning, and welcome to The Wonders of Physics".

Energy from Vacuum

An experiment by Roman E. Solomyanny

Review is prepared by Editor Olga Leontyeva

Editor's: You can get in touch with Roman E. Solomyanny by e-mail: evantarian@fct.ru.

The invention is based on a theory saying that all the ambient space is filled with virtual particles, which come in to being and vanish instantly. As is well known, it requires certain energy to generate a couple of particles (particle-antiparticle). According to the above-stated theory, all the ambient space is filled with energy. And the following phenomena can evidence it: relic radiation and practical impossibility of reaching the absolute zero temperature.

The idea to create such a device came to the author as early as in 2000, but its realization took some time since he had no necessary materials. That was the reason why the experiment was executed only in summer 2002.

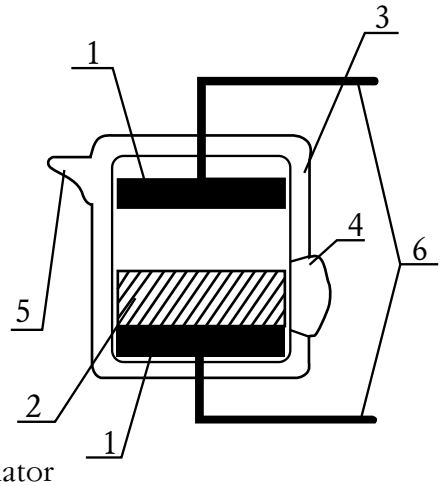
The device consists of two silver plates (silvered copper can be used as well). They supply power to a resonator and take off excess of generated energy. Between the silver plates there is a quartz plate that forms active body of the resonator. This plate is made of natural crystal (it has more ordered structure) or rock crystal. In order to provide purer vacuum there is used a cylinder vacuum chamber with a vacuum-pump nipple. The device also comprises two permanent Fe-Nb-B magnets (in order to polarise a little the active body) and bracing for the active body of the resonator. An experiment with one quartz plate has turned out to be successful (see the figure). The explanation is that making a device with several plates requires high preseason adjustment of the parts and it is rather difficult to fix them.

The device starts up by means of a simplest high frequency pulse generator and a power amplifier. Load in the circuit is a mandatory requirement for operation of the device. The mode of building-up oscillations was the initial one (second to the calibration mode). The output capacity of the device after the mode of building up oscillations was about 20Wt ±2-3Wt.

Within 3 months the device was showing fail-free operation in the initial mode (at that power was not totally taken off). The device was running at high power during several minutes and then the crystal collapsed. It happened because we had used gypsum to make the crystal (the use of more advanced materials such as natural rock crystal or highly refined gypsum gives higher power output). The active body collapsed because its mechanical oscillations exceeded the ultimate stress.

During the operation of the device there were observed the following side effects: self-cooling (as a result of it, the active body became brittle) and very intensive high-frequency radiation (neon lamps, which were at about one meter from the device, lighted up).

At building the device we had difficulties in making the plates. It was necessary to adjust them with high precision so the cost of the project rose. Bad adjustment leads to excessive harmonics. Therefore if we want to reproduce the experiment and improve the device then its components should be custom-built and appropriate materials should be used to make crystals.



1- silver plates
2- crystal – resonator
3- glass chamber, 3 cm thick
4- seal point of the crystal
5- output to the vacuum-pump
6- contacts of energy input/output

Meeting of Nobel Prize Laureates in Saint Petersburg

Report by our correspondent Alla Pashova

The meeting of laureates of the Nobel Prize "Science and Progress of the Mankind" was held in St. Petersburg from 16 through 22 of June 2003. Well-known scientists from Belgium, Great Britain, Germany, the USA, Italy, China, Switzerland and Japan took part in the meeting. During this week ceremonies alternated with scientific conferences, round-table discussions and public lectures. All that gave occasion to remind once again of the great contribution of Russian scientists into the world science and to read out an impressive list of the names starting from Mikhailo Lomonosov to Pyotr Leonidovich Kapitza.

Jores I. Alferov

There is no doubt that the fundamental science requires equally fundamental PR, which would attract necessary investments to this sphere. However we must not forget that even the most brilliant services of the past years cannot be an "indulgence" that grants absolution of scientific dogmatism.

The authorities (the federal ones!) try to place the emphasis right on the newness and innovations. However they do not want to lose possible economic benefits because of conformism of the traditional science. The "dormant" thought must be awakened. Therefore in his speech at the opening ceremony Jores I. Alferov (Nobel laureate and Vice President of the Russian Academy of Science) expressed regret that good international scientific competition did not exist any more, as it had been provoked by the Cold War between the USSR and the USA.

Vice Prime Minister Valentina Matveenko hopes that Russia will offer to the world market not its oil and gas, but its ideas, innovations and technologies. Moreover, Matveenko appealed to the candidates and academicians, engineers and designers to "join the efforts aimed to make Petersburg an innovative capital of Russia". "Petersburg is open for new progressive ideas" – Valentina Stepanovna said in conclusion.

On June 17 within the framework of the meeting there was held a round-table discussion "Problems of Power Engineering". It was dedicated to new methods of energy commutation, transformation and generation. The first report reminded of the recent presentation of "Global Energy Prize" that had been covered in the previous issue of our magazine. One of the prizewinners, G.A. Mesyatz, who specializes in the field of powerful pulse energy, told how Russian scientists had managed to solve the problem of high currents.

Academician V.E. Fortov presented an interesting way of electromagnetic energy accumulation. It has turned out that if we surround xenon or hydrogen with a strong electromagnetic field and compress them to a solid state it will be possible to accumulate huge amount of energy. On this principle there was made a magnetic explosion-generator, which enables to reproduce a stroke of lighting in the power transmission lines, to stimulate production of minerals and to check the protection of high-end control systems against electromagnetic terrorism.

Professor F.G. Ruthenberg (Institute of Problems in Electrical Physics, Russian Academy of Science) described a technology of energy generation by means of burning high-toxic wastes (including pharmaceutical industry wastes) that was worked out by specialists of the Institute. The developed

device enables to generate 5 kWt/h by burning 1 kg of wastes.

The report of Jores I. Alferov was about prospects of the application of renewable sources of energy. The Nobel laureate sees the future of the world power engineering exclusively in the accumulation of solar energy. The reserves of minerals – coal, oil and gas – will be over in couple hundred years.

The nuclear power engineering produces too many harmful wastes, besides the reserves of uranium in the Earth's interior will last no more than a hundred years. Alferov proposes not to wait till the next energy crisis but to start realization of a Russian analogue of the German project "1000 Roofs" (1990-1995). Let us remind that according to this program photovoltaic power systems were installed on the roofs of private houses in Germany.

At present times, as Alferov pointed out, the application multi-gap solar cells (MGSC) enables to create solar batteries with the efficiency that is roughly equal to 78%. And if we locate them not in the overcast Petersburg, but in sunny south it will provide Russia with great amount of cheap electrical energy. Then the solar energy technology will probably turn from a hobby of senescent academicians into one of the major branches of the modern power engineering.

We asked A.I. Egorov, leading specialist of Petersburg Nuclear Physics Institute (PNPI) to comment the situation. The scientist considers ideas of J.I. Alferov rather skeptically, alluding to the opinion of B.P. Konstantinov (the founder of PNPI):

Anton I. Egorov

"Solar energy is very scattered. Concentrators (at least parabolic mirrors) are required to collect such energy. Besides, there is a need in a device that turns the mirrors to follow the Sun as well as an accumulating device that stores the energy during the day and distributes it at night and when the weather is nasty. It would be reasonable to locate solar power plants in deserts but that would require enormous depreciation reserves. Moreover, we should remember that the world mineral resources are limited. The extractive industry will not be able to provide photocells production facilities with sufficient supply of gallium and arsenic for the synthesis of gallium arsenide.

There is an opinion that if we install a wind turbine on every house and solar batteries on every roof (with a storage battery in the basement), and if we consume electrical energy with German economy, then in 2030 it will be possible to consider the issue of further licensing of German atomic power-stations. However the German APPs will go on functioning. Germany spends annually 505 tons of single-crystalline silicon, buying it up from all the world producers. In 25 years they are going to generate one third of the necessary energy from the renewable sources. Despite of all the efforts, most of the energy will be generated by heat power plants with CO_2 emissions to the atmosphere. To my mind, the application of such renewable sources of energy as solar light or wind will not be able to solve the energy problem of the mankind".

Perpetual Motor With Magnetic Control Elements

Review is prepared according to the Patent #2830575, France

There is a description and principles of operation of the device, which was created and patented by Mikhail Smeretchanski (France). The principle of operation of such gravitational motors allows to get considerable useful power (for example, in the form of electrical energy) without use of fuel. The main advantages of such energy sources are their environmental safety and wide application (from autonomous supplying of separate dwellings and settlements with light and heat to complete supplying of factories and plants with energy). There is also a possibility to supply back lands with electrical energy (in such regions distant power supply is hampered and isolated generating plants should be used). Besides among other advantages of these motors we can also consider the possibility to improve them and easily assembling design.

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Author: M. Smeretchanski

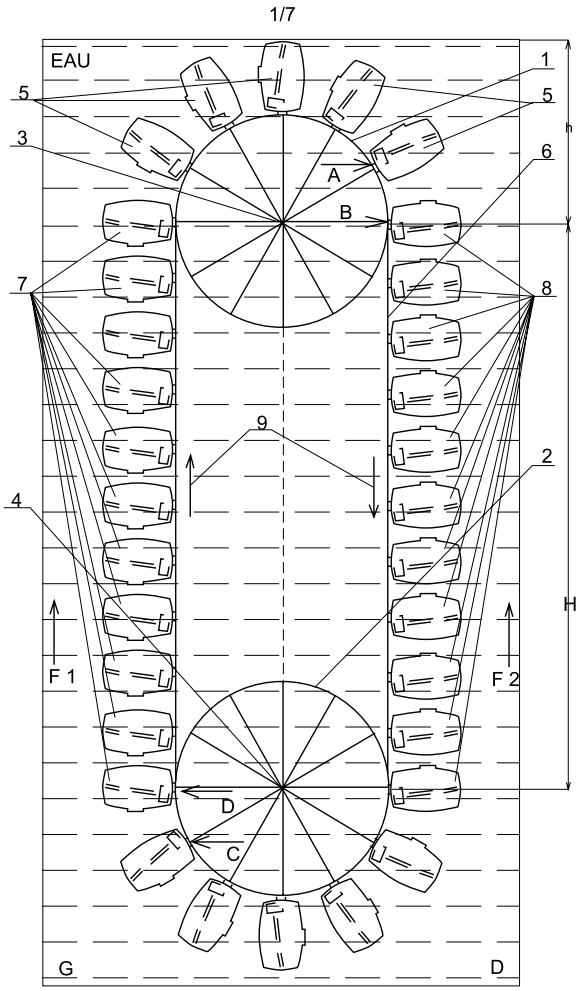

Fig. 1

Motion in the device is realized due to the difference of buoyancy forces which acts on the opposite arms of the moving elements. The difference is achieved by means of purposefully controlled or forcedly organized change of volumes of working body of float mechanisms.

This mechanism demonstrates the possibility to get energy using buoyancy forces (the Archimedes force) which act on a body immersed in liquid. This invention relates to a device allowing the mechanical production of energy, using the variable-volumes elements by the gravitation and the Archimedes force for its operation. Variable-volumes elements will change their volumes according to position of the masses, in their inner parts.

The device is made up of two wheels (1) and (2) and of the variable-volumes elements (see Fig.1), which are immersed and fixed with the links of a chain (8), producing the difference (ΔF) between the Archimedes forces (F 1) and (F 2) of the two dimensions of the device, which will draw the chain in the direction indicated on the diagram by arrows (9) and cause the rotation of the wheels (1) and (2). The

whole device is immersed vertically.

The change of volumes of the elements will take place according to the position of the masses inside. Under the action of gravitation masses will change the volume of the elements, and the Archimedes force will produce the rotation of the wheels (1) and (2), according to the positions of the elements in relation to the axes of the wheels (see Fig.1). Additional drawings of sectional view of float elements are represented in Fig. 2-5.

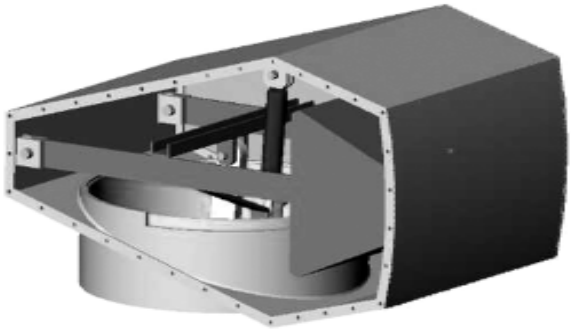

Fig. 2

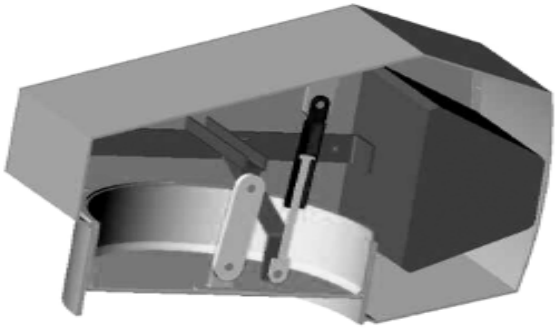

Fig. 3

Fig. 4

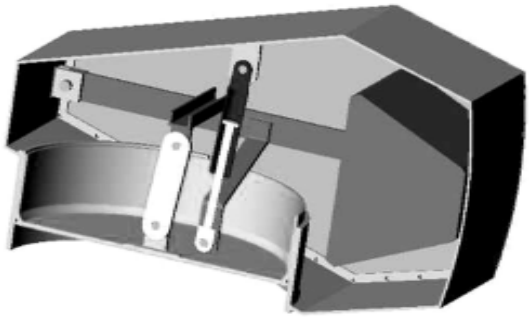

Fig. 5

At turning of a magnetic float the position of the control magnetic element changes relatively to the stator (stator turns over 180°). The working volume changes under the influence of the opposite direction of forces. Movable magnetic rotor is kept in a definite permanent position by means of outer floats.

Method for calculation of motor and masses

Gas springs (gas cylinders, which under pressure are filled with nitrogen) are used in the device. By the principle of operation these springs are identical to the components, which are used in automobiles to open and support a back door.

Let us assume that lower axle of the wheel is at a depth of 5.5 m (it is meant the distance between axles of the upper and lower wheel because the depth where the upper axle is mounted and the whole motor do not have vital importance). Gas springs should be selected according to the difference between the depths of axles of the wheels.

Let us assume that axle of the upper wheel is at the depth of 3 m. Water pressure at this depth comes to about 0.3 kg/cm^2. If weight of the mass is equal to 100 kg then piston area is 100 kg x 8 (coefficient)=800 cm^2. Let us add 10 kg of weight to overcome friction. Thus working weight of the mass comes to 110 kg. Area of the piston of the float is 800 cm^2.

At the depth of 3 m the pressure to the piston is 800 x 0.3=240 kg. The piston presses the arm transmitting to its end the force equal to 240:2=120 kg. Thus at the end of the arm, i.e. at gas springs, we have 120 kg (see Fig. 1, point B). Let us add 110 kg (weight of the mass), then 120+110=230 kg, which are directed vertically downward. Thus it is necessary to use gas springs (there are two of them

in the example), which have force of 115 kg each. Mass, which is displaced downward under the action of weight (gravitational force) and pressure produced by the piston, will "contract" gas springs. At that, potential energy will be accumulated in contracted springs in the form of propulsive force.

Travel of mass equals to 50 cm, therefore piston stroke is 25 cm, whence area of the piston is 800 cm^2 x 25 cm = 20 000 cm/cubical, which is equal to 20 liters. This work will be made between points A and B (Fig. 1). The volume of the element will be decreased by 20 liters.

When the element, which we mentioned in the beginning of the example, in the process of displacement (immersion) will be at the level (or almost at the level) of the axel of the lower wheel on the left side (Fig. 1 point D) at the depth of 8.5 m (5.5 m + 3 m=8.5 m) then water pressure (of about 0.85 kg/cm^2) will act upon the piston. Thus water pressure will come to 680 kg (piston area 800 cm^2 x 0.85=680 kg).

At that, traveling over the lower wheel, the float will turn over 180°. To resist this pressure there is 110 kg of mass in each spring + 115 kg, whence 115 x 2 + 110 = 340 kg, which are directed vertically downward. Taking into account that the middle of the arm pushes the piston then it will be influenced by the force of 340 x 2 = 680 kg.

Thus equal forces act from two sides. In this case at upper right the piston will be put down a little lower than 3 m (water pressure will increase). At the left below it will be put down a little higher (water pressure will decrease).

If mass below will increase by 5 or 10 kg (between points C and D, Fig. 1) then under the action of mass weight and force of the springs the piston will move downward increasing element volume by the same 20 liters.

Certainly to liberate energy it is necessary to reduce speed of rotation of the device in order to decrease friction losses in water (it is known that friction losses at transference in water is proportional to the traverse speed).

Test of the motor model

To check this principle of perpetual motion the inventor made the model of the motor. Fig. 6 represents the model of the perpetual motor with magnetic control elements. Working model was made according to more simple scheme.

Model test demonstrated principal possibility to produce perpetual motion. In spite of rather primitive design of the device there was observed stable rotation of the motor.

According to M. Smeretchanski, he made sure that law of conservation of energy does not "work" in the case if there is no clear idea on the nature and interaction of outer electromagnetic, gravitational or other possible fields and fluxes of particles with existing matter or operating environment. Thus the law should be "closed", at least, in its modern broad understanding as getting of energy. It is possible to offer another formulation: "Any force (or forces) can be used to produce energy", or in other words, "To do useful work it is possible to use any forces including forces of potential fields."
Please visit:
http://ingenrw.narod.ru/Andv1/Opi2_1.html
for more information about the invention.

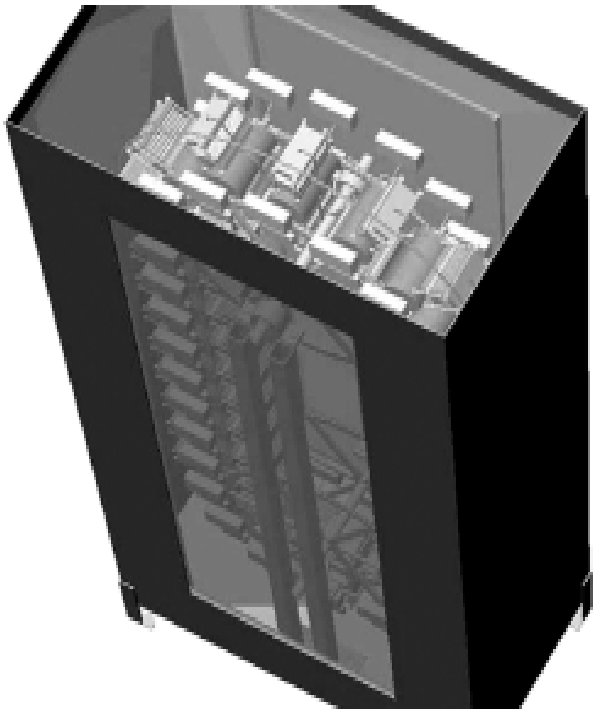

Fig. 6

Model of the device

Who Needs Controlled Thermonuclear Fusion?

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The problem of energy generation was of interest to mankind since time immemorial. Nowadays it becomes more and more critical and pressing because power requirement increases while available fuel reserves are limited within 100-300 years (depending on the sort of fuel we use).

All the energy problems of mankind can be solved if we succeed in developing CTF (controlled thermonuclear fusion) of hydrogen isotopes.

The history of CTF goes back to 1945 when a night-school student from Sakhalin, known to nobody in the scientific world, Oleg Andreevich Lavrentyev (at that time he served as a sergeant) proposed to use electrical field to provide thermal insulation of fully ionised gases for the purpose of industrial neutralisation of thermonuclear reactions. Later in 1952 similar ideas were also put forward in the USA (L. Spitzer). Since then the leading countries of the world have been carrying out a great number of experiments using devices of different design. Though within this period they have spent on research work over 30 milliard dollars in total, the target terms of the industrial application of CTF are constantly postponed and the ultimate aim of CTF, i.e. energy generation at least by an experimental device, has not been achieved. If we presume that by now CTF is ready for industrial application, even in this case there are a number of impediments:

1. The weight of a copper solenoid of commercial nuclear reactors can reach 100 thousand tons. And how many reactors of the kind will we need? Very likely, because of "copper famine" we will have to reject magnetic thermonuclear fusion at all.

2. A classical CTF requires tritium and deuterium. Deuterium is generated of plain water by means of electrolysis (6 litres of water per 1 gram of deuterium). Tritium is a very expensive isotope (so expensive that we can just ignore the cost of deuterium).

3. The winding of an industrial CTF will store the amount of magnetic energy that is equal to 15-20 tons of trotyl. If the magnetic winding breaks down it may result in an explosion!Despite of all these technical difficulties CTF is regarded as a prospective trend because one litre of water contains so great quantity of deuterium that it can substitute for 300 tons of gasoline. That is why different countries still go on investigating in this field, in different aspects and basing on various principles.

There is a new method of CTF being developed on recent days, which enables the following

1. To generate so much energy from 1 litre of water to substitute for 30,000 tons of gasoline, i.e. 100 times more than by means of a classical CTF reactor.
2. Fuel for this device is produced several times easier, faster and cheaper. It is fed to the reaction zone continuously and in safe doses.
3. The required quantity of copper is no more than 5-10 kg (instead of 100,000 tons).
4. Gradual fuel heating up to any preset temperature and heat maintenance within any varied period of time (at present no more than 100 million °C and 0.01sec).
5. Over 7 levels of control over the process of reaction (in the classical process – at most two levels).
6. The device can be of any dimensions and weight according to customer's wish and applied productive capacity.
7. The cost of this experimental device, which is already being built according to finished working drawings, does not exceed 10 thousand dollars. Let us notice that a cheapest CTF device will cost from 10 to 100 million dollars (The international project of application of an experimental CTF device will cost roughly 9 milliard dollars).
8. The industrial variant of the device will be built of ordinary and cheap materials and its cost will be 3-4 times less than the price of an experimental device of the equal capacity (roughly 100 kW).

Comparative analysis of two future CTF devices

Academician Velikhov's device (Russian weekly "Itogi", February 2003, Thermonuclear ITER national) is compared to I.B. Kalugin's device (Naberezhnye Chelny, Russia)

Velikhov's CTF device	Kalugin's CTF device
The realization of the project requires 5 milliard dollars (first cost – 9 milliard dollars).	The cost of the project is 100-200 dollars.
To start the project it is necessary to get a permission of the heads of "Big Eight".	Five of the seven units of the future device have already been built and the work goes on.
Since the moment of signing a contract it will take 108 months (9 years) to generate plasma. 5 more years – for experimenting and 10 years – for designing and construction.	Production terms: May 30, 2003 – making of 2 remaining units; by June 15, 2003 – assemblage and adjustment; by June 30, 2003 – test operation.
A coalition of several leading countries is required.	A working device can be built by the authors' own strength.
Capital outlays are great. Atomic power plants are considerably simpler than the CTF devices. Sharing in energy costs: Heat power plants: 25% - capital outlays, 75% -fuel APP: 80% - capital outlays, 20% - fuel CTF: 98% - capital outlays, 2% - fuel.	Outlays are negligibly small: 1% - capital outlays and 0.001% - fuel.
The cost of electrical energy is comparable to the APP product.	The cost of electrical energy will be dozens and hundreds times lower.
Can CTF replace nuclear reactors for ships and submarines? The dimensions of a CTF reactor depend on the features of present-day materials.	Dimensions and capacity can be any varied. Materials – the cheapest and the most available.
Cyclic mode of operation: start-stop, etc.	Any desirable mode of operation.
Conventionally, from one litre of water it is possible to generate the same amount of energy as from 300 tons of petrol.	From one litre of water we can generate the same amount of energy as from 30,000 tons of petrol.
If superconductive magnetic windings of a CTF break down, it will explode. The explosion is equal to an explosion of 10-15 tons of trotyl.	The risk of explosion is absolutely excluded. If the device breaks down, it is roughly no different from the breakdown of an electric motor.
The thermonuclear energy era will come (at best) in 24-30 years.	As early as in 2003 it will be possible to start mass production of cheap CTF reactors of any capacity and dimensions.
Fuel for CTF (deuterium) is generated by means of water electrolysis. In order to get 1 litre of deuterium it is necessary to decompose 6,000 litres of water.	Primary fuel production cost is practically equal to zero.
There are two parameters of control.	There are two or more parameters of control. That is why the CTF process can be fully automated in any stages and any modes.
At present nobody offers a thermonuclear automobile.	It is offered to work out a CTF design using deuterium-tritium cycle with electrical energy output 80% and heat output 20%. (Electrical energy output of classical heat power plants and APP is 25%). The technology in question will enable to apply electrical motors to automobiles instead of internal-combustion engines.
The systems for heating megapolises with CTF are located in the outskirts.	It is possible to heat any freestanding building. There is an absolute independence from central heating systems.

Tough TCF is such a cheap heat and electrical energy source it will not compete with gas, oil and coal, which significance will even rise. As a result of growing needs of mankind, they will be used as sources of raw materials for chemical industry.

Editor's: Currently the authors have been working at elimination of some imperfections of their experimental CTF device. After that they are going to apply for a patent on the invention.

Fuel Cells: Environmental Friend or Foe?

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Hydrogen fuel cells have been widely touted as an environmentally-friendly alternative to conventional fossil fuels. By oxidising molecular hydrogen, the only direct by-product of their energy generation is water, which means they could significantly reduce pollution and man-made greenhouse gases. But a group of researchers in the US believes that fuel cells could themselves have a detrimental effect on the environment.

Tracey Tromp and colleagues at the California Institute of Technology have used models of the atmosphere to show that the inevitable emissions produced by fuel cell technology could substantially damage the ozone layer (T. Tromp *et al.* 2003 *Science* 300 1740).

A completely efficient system of producing, storing and transporting hydrogen should, in principle, lead to no unwanted emissions of the gas.

But the Caltech researchers point out that such a system would be expensive, and that in reality around 10-20% of the hydrogen would escape into the atmosphere. They say that if hydrogen fuel cells replaced all of today's oil and gas-based combustion technologies, such losses would double or even triple the total hydrogen deposited into the atmosphere at the Earth's surface.

"More or less dramatic scenarios are equally imaginable, but clearly the potential impact on the hydrogen cycle is great," say the researchers.

Tromp and colleagues say that the hydrogen would be oxidised when it reaches the stratosphere, which would cool the stratosphere and create more clouds.

This would delay the break up of the polar vortex at the north and south poles, making the holes in the ozone layer larger and longer lasting. They estimate that the extra hydrogen will lead to a 5-8% rise in ozone depletion at the north pole and between 3 and 7% at the south pole.

The exact scale of this additional ozone depletion, however, depends on a number of unknown quantities. In addition to uncertainty over the extent of hydrogen emissions in the future, little is understood about how soil absorbs hydrogen from the atmosphere. The researchers say it is conceivable that this process could compensate for all new anthropogenic emissions.

From Tesla's Wireless Ionospheric Electricity

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Overview

The *Wardenclyffe Tower Centennial (1903-2003)* is an opportunity to celebrate a monument to Nikola Tesla's visionary genius. Recently, a resurgence of interest from prominent physicists has focused on the unusual method of pulsing a broadband Tesla coil at a repetition rate of 8 Hz to resonate with the Earth's Schumann cavity [1]. Nikola Tesla, the father of AC electricity, is responsible for recognizing that an atmospheric and a terrestrial storage battery already exists everywhere on earth, for the benefit of mankind. This is perhaps the "wheelwork of nature" that Tesla was referring to *("... it is a mere question of time when men will succeed in attaching their machinery to the very wheelwork of nature." – Tesla addressing the Amer. Inst. of Elec. Eng., 1891).* A century later, only a handful of visionary scientists recognize the untapped renewable reservoir of terawatts of electrical power (3000 gigawatts) that sits dormant above us, waiting to be utilized.

Background

In 2001, the Bush-mandated National Transmission Grid Study (NTGS 2001) was designed to identify the major transmission bottlenecks across the U.S. and identify technical and economic issues resulting from these transmission constraints. With deregulation of U.S. utilities and the lack of jurisdiction for the Federal Energy Regulatory Commission (FERC), the U.S. is fighting an electrical energy crisis which right now, costs consumers hundreds of millions of dollars annually due to interregional transmission congestion. There is no longer any economic incentive nor any FERC eminent domain for states to provide rights-of-way, besides the lack of Federal compensation to utilities to build new transmission lines.

Fig. 1

The 187-foot Wardenclyffe Tower in 1903 which stood unfinished for the next 14 years

Historically, the creation of electrical utilities was beset with scandal, such as the six years of Congressional hearings starting in 1928 in which "thousands of pages of testimony revealed a systematic, covert attempt to shape opinion in favor of private utilities, in which half truths and at times outright lies presented municipal systems in a consistently bad light [2]."

Today, US AID funds the U.S. Energy Association to train utility representatives from the former Russian states on how to reliably monitor electricity usage and collect money from customers in their respective countries, while those economically challenged people struggle for sufficient wages.

At a Washington DC conference which this author attended, called "Implementing a National Energy Strategy: Breaking Down the Barriers" also sponsored by the US Energy Association (12/01), only the depressing news about unresolved US electricity headaches were discussed. Editor of *Energy Daily*, Llewelyn King finally concluded, "*We are using 19th century technology for electrical transmission*." He then called for a paradigm shift toward new technology and cited the "monster infrastructure problems" within the U.S. as compared to the developing countries. A year later (June, 2003) the US DOE held an emergency meeting with utility heads as a natural gas crisis looms from the lack of diversification of new electrical power generation facilities. "Innovation in new technology and renewable sources are needed in the long term to improve the environment and meet rising demand," summarized an *Investors Business Daily* editor about the crisis [3].

In November, 2002, the American Council for the United Nations University called for *wireless energy transmission* to circumvent the need for transmission lines as part of their "Millennium Project." In cooperation with the National Science Foundation (NSF), NASA, and the Electrical Power Research Institute (EPRI), the beaming of microwave energy and the creation of a world energy organization was seen to actively address the 2020 challenges to global electricity supply, especially in areas of massive urban concentrations [4].

In 1940, "the United States prided itself on using half the world's electricity [5]."Since 1980, the U.S. has also doubled its dependence on foreign oil and *doubled* its electrical transmission grid inefficiency. From 31 Quads (quadrillion BTUs) generated, a full *2/3 is totally wasted* in "conversion losses" with only about 11 Quads (3.7 trillion kWh) delivered to the end-user [6]. Instead of trying to build 2 power plants per week (at 300 MW each) for the next 20 years (only to have a total of additional 6 trillion kWh available by 2020), as the Bush-Cheney Administration wants to do, we simply need to *eliminate the 7 trillion kWh of conversion losses* in our present electricity generation modality.

History of Tesla's Wireless Energy

The fateful decision in 1905 by J. P. Morgan to abandon Tesla's Wardenclyffe Tower project on Long Island (after investing $150,000), was a result of learning that it would be designed mainly for *wireless transmission of electrical power*, rather than telegraphy. No more money was forthcoming for the project that Morgan initiated, even when the equipment cost alone cost about $200,000. Morgan believed that he would "have nothing to sell except antennas (and refused) to contribute to that charity [7]."

Tesla tried and tried for years until in 1917 the U.S. government blew up the abandoned Wardenclyffe tower because suspected German spies were seen "lurking" around it. With Edison as his willing ally, Morgan even publicly discredited Tesla's name, so that all of the five school textbook publishers of the time removed any reference to him. Any wonder why even today, 100 years later, hardly anyone knows who Tesla is?

> *In view of our present fossil-fuel-caused global warming, Tesla seems very prophetic from his vantage point of a century ago.*

The rest of this article will present a physics and electrical engineering argument for a subsequently forgotten engineering alternative for energy generation and transmission.

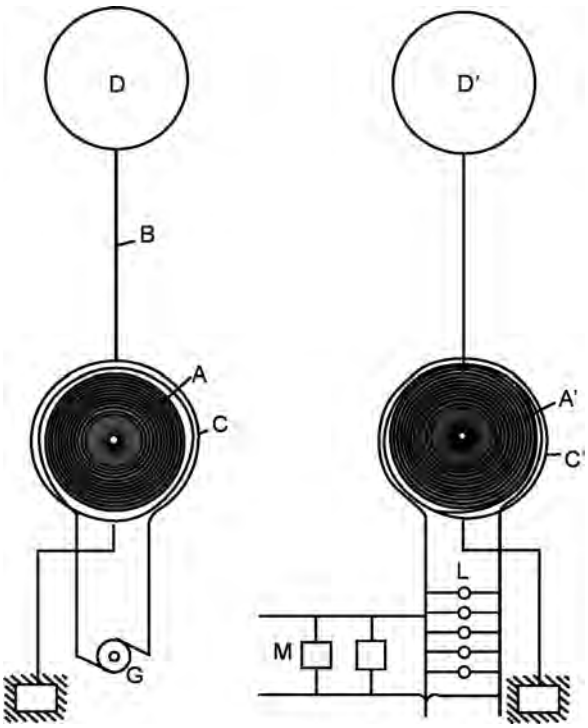

Fig. 2

As Tesla experimented with a 1.5 MW system in 1899 at Colorado Springs, he was amazed to find that pulses of electricity he sent out passed across the entire globe *returned with "undiminished strength."* He said, "It was a result so unbelievable that the revelation at first almost stunned me [8]." This verified the tremendous efficiency of his peculiar method of pumping current into a spherical ball to charge it up before discharging it as a pulse of electrical energy, *a "longitudinal" acoustic-type of compression wave*, rather than an electromagnetic Hertzian-type of transverse wave. It was therefore, more akin to electrostatic discharge than wave mechanics.

Tesla also planned to include a *stationary resonant wave* creation globally, within the earth-ionosphere cavity, as part of the wireless transmission of power. Examining the pair of 1900 patents #645,576 and #649,621 each using the same figure on the first page, we find in the first patent that Tesla has designed a quarter-wave antenna (50 miles of secondary coil wire for a 200 mile long wavelength). More importantly is the sphere on the top which is supposed to be a conductive surface ona balloon raised high enough to be radiating in "rarefied air (International patents, as well as US patents, are now available online from http://gb.espacenet.com/espacenet/)."

As Tesla states, "That communication without wires to any point of the globe is practical with such apparatus would need no demonstration, but through a discovery which I made I obtained absolute certainty. Popularly explained it is exactly this: When we raise the voice and hear an echo in reply, we know that the sound of the voice must have reached a distant wall, or boundary, and must have been reflected from the same. Exactly as the sound, so an electrical wave is reflected, and the same evidence which is afforded by an echo is offered by an electrical phenomena known as a 'stationary' wave – that is, a wave with fixed nodal and ventral regions. Instead of sending sound vibrations toward a distant wall, I have sent electrical vibrations toward the remote boundaries of the earth, and instead of the wall, the earth has replied. In place of an echo, I have obtained a stationary electrical wave, a wave reflected from afar [9]."

Nikola Tesla's discovery of pulsed propagation of energy does not resemble the standard transverse electromagnetic waves so familiar to electrical engineers everywhere. Many engineers and physicists have dismissed Tesla's wireless energy transmission as unscientific without examining the unusual characteristics and benefits of longitudinal waves, which are the z-component solutions of Maxwell equations.

Tesla wrote, "That electrical energy can be economically transmitted without wires to any terrestrial distance, I have unmistakably established in numerous observations, experiments and measurements, qualitative and quantitative. These have demonstrated that it is practicable to distribute power from a central plant in unlimited amounts, with a loss not exceeding a small fraction of one per cent in the transmission, even to the greatest distance, twelve thousand miles – to the opposite end of the globe [10]."

Tesla was an electrical genius who revolutionized our world with AC power in a way that DC power could never have accomplished, since the resistance of any transmission lines, (except perhaps,

superconductive ones), is *prohibitive* for direct current. He deserved much better treatment from the tycoons of his age, than to spend the last 40 years of his life in abject poverty. However, he was too much of a gentleman to hold a grudge.

Instead, regarding the magnifying transmitter, Tesla wrote in his autobiography, "I am unwilling to accord to some small-minded and jealous individuals the satisfaction of having thwarted my efforts. These men are to me nothing more than microbes of a nasty disease. My project was retarded by laws of nature. *The world was not prepared for it. It was too far ahead of time. But the same laws will prevail in the end and make it a triumphal success* [11]."

Tesla's World System

Tesla's "World System" was conceptually based on three inventions of his:

1. *The Tesla Transformer* (Tesla coil)
2. *The Magnifying Transmitter* (transformer adapted to excite the earth)
3. *The Wireless System* (efficient transmission of electrical energy without wires).

Tesla states, "The first World System power plant can be put in operation in nine months. With this power plant it will be practicable to attain electrical activities up to 10 million horsepower (7.5 billion watts), and it is designed to serve for as many technical achievements as are possible without due expense [12]." Tesla's calculated power levels are conservatively estimated and recently updated with contemporary physics calculations by Dr. Elizabeth Rauscher. For example, Professor Rauscher shows that the earth's ionosphere and magnetosphere contains sufficient potential energy, *at least 3 billion kilowatts (3 terawatts) respectively,* so that the resonant excitation of the earth-ionosphere cavity can reasonably be expected to increase the amplitude of natural "Schumann" frequencies, facilitating the capture of useful electrical power. Tesla knew that the earth could be treated as one big spherical conductor and the ionosphere as another bigger spherical conductor, so that together they have parallel plates and thus, comprise a "spherical capacitor [13]." Rauscher calculates the capacitance to be about 15,000 microfarads for the complete earth-ionosphere cavity capacitor. In 1952, W.O. Schumann predicted the "self-oscillations" of the conducting sphere of the earth, surrounded by an air layer and ionosphere, without knowing that Tesla had found the earth's fundamental frequency fifty years earlier [14].

"All that is necessary," says Dr. James Corum, is that Tesla's transmitter power and carrier frequency be capable of round-the-world propagation." In fact, Tesla (in the *L.A. Times*, Dec. 1904) stated, "With my transmitter I actually sent electrical vibrations around the world and received them again, and I then went on to develop my machinery." Dr. Corum notes in an article on the ELF (extremely low frequency) oscillator of Tesla's that the tuned circuit of Tesla's magnifying transmitter was the whole earth-ionosphere cavity [15].

Corum explains that a mechanical analog of the lumped circuit Tesla coil is an easier model for engineers to understand [16]. From a mechanical engineering viewpoint, the "magnifying factor" can be successfully applied to such a circuit. "The circuit is limited only by the circuit resistance. At resonance, the current through the circuit rises until the voltage across the resistance is equal to the source voltage. This circuit

was a source of deep frustration to Edison because voltmeter readings taken around the loop did not obey Kirchoff's laws!" As a result, Edison claimed such a circuit was only good for electrocution chairs.

Earth's Renewable Energy

Tesla's world system activates the earth's renewable electrical storage battery which normally sits dormant except during lightning strikes. Regarding simply the electrostatic energy storage capacity of the ionosphere, Dr. Oleg Jefimenko, author of *Electrostatic Motors*, explains that during one electric storm, the atmospheric electric field dissipates at least 0.2 terawatts (billion kilowatts), indicating that the entire earth must have even more total available energy [17].

Furthermore, the power loss experienced by Tesla's pulsed, electrostatic discharge mode of propagation was less than 5% over 25,000 miles. Dr. Van Voorhies states, "...path losses are 0.25 dB/Mm at 10 Hz," which often is difficult for engineers to believe, who are used to transverse waves, a resistive medium, and line-of-sight propagation modes that can dissipate 10 dB/km at 5 MHz [18].

The *capacitive dome* of the Wardenclyffe Tower, like the conductive balloon of Tesla's '576 patent, is a key to the understanding of the longitudinal waves. Dr. Rauscher quotes Tesla, "Later he compared it to a Van de Graaff generator. He also explained the purpose of Wardenclyffe...*'one does not need to be an expert to understand that a device of this kind is not a producer of electricity like a dynamo, but merely a receiver or collector with amplifying qualities* [19]."

Only a few great physicists like Drs. Elizabeth Rauscher, James Corum, and Konstantin Meyl have realized that Tesla was very practical when he proposed the resonant generation and wireless transmission of useful electrical power. *(Professor Konstantin Meyl sells a "Demo Set" that is a miniature dual dome like Tesla patent '576, a wireless longitudinal wave demonstration kit, available at http://www.k-meyl.de/Demo-Set/body_demo-set.html. Enter this link at www.freetranslation.com for English).*

Tesla's knowledge of atmospheric electricity transduction was so extensive and reliable that Jim Corum, who has been funded to continue Tesla's work, recently told me, "You just have to do exactly what Telsa did and you will consistently get the same results he did [20]."

Tesla's world system activates the earth's renewable electrical storage battery which normally sits dormant except during lightning strikes.

After returning from his experiments at Colorado Springs in 1900, Nikola Tesla stated, **"***If we use fuel to get our power, we are living on our capital and exhausting it rapidly. This method is barbarous and wantonly wasteful and will have to be stopped in the interest of coming generations* [21]." In view of our present fossil-fuel-caused global warming, Tesla seems very prophetic from his vantage point of a century ago.

High Transmission Integrity and Low Loss

Tesla states, "As to the transmission of power through space, that is a project which I considered absolutely certain of success long since. Years ago I was in the position to transmit wireless power to any distance without limit other than that imposed by the physical dimensions of the globe. In my system it makes no difference what the distance is. The efficiency of the transmission can be as high as 96 or 97 per cent, and there are practically no losses except such as are inevitable in the running of the machinery. *When there is no receiver there is no energy consumption anywhere. When the receiver is put on, it draws power. That is the exact opposite of the Hertz-wave system.* In that case, if you have a plant of 1,000 horsepower (750 kW), it is radiating all the time whether the energy is received

or not; but in my system no power is lost. When there are no receivers, the plant consumes only a few horsepower necessary to maintain the vibration; it runs idle, as the Edison plant when the lamps and motors are shut off [22]."

These amazing facts are explained by Corum(s) and Spainol, "...the distinction between Tesla's system and 'Hertzian' waves is to be clearly understood. Tesla, and others of his day, used the term 'Hertzian waves' to describe what we call today, energy transfer by wireless transverse electromagnetic (TEM) radiation...no one wants to stand in front of a high power radar antenna. For these, E and H are *in phase*, the power flow is a 'real' quantity (as opposed to reactive power), and the surface integral of E x H (Poynting vector) is nonzero.

The case is not so simple in an unloaded power system, an RF transformer with a tuned secondary, or with a cavity resonator. In these situations, the fields are in phase quadrature, the circulating power is reactive and the average Poynting flux is zero – *unless a load is applied*. They deliver no power without a resistive load. These are clearly the power systems which Tesla created. The polyphase power distribution system was created by him in the 1880s and inaugurated at Niagara Falls in 1895. The RF transformer was invented and patented by him in the 1890s. Terrestrial resonances he experimentally discovered at the turn of the century. And, for the next 40 years he tried to bring through to commercial reality this global power system. Today, millions of us have working scale models of it in our kitchens, while the larger version sits idle [23]." Note for a spherical, electrostatic pulse discharge, E is radial and H is helical since J is radial (longitudinal or irrotational current) [24].

Biological and Economic Impact

Another common criticism of the Tesla wireless power system is regarding its possible biological effects. Calculating the circulating reactive power, Corum(s) and Spainol find a density of a *microVAR per cubic meter* at 7.8 Hz, which is quite small, while it is well-known that such a frequency is very biologically compatible [25]. The authors also look at the present 100 V/m earth-ionosphere field and again find that raising it by a factor of 4 to 10 will pose no ill effects. (Thunderstorms do it all of the time around the world.)

In terms of economic theory, many countries will benefit from this service. Only private, dispersed receiving stations will be needed. Just like television and radio, a single resonant energy receiver is required, which may eventually be built into appliances, so no power cord will be necessary! Just think: monthly electric utility bills from old-fashioned, fossil-fueled, lossy electrified wire-grid delivery services will be optional, much like "cable TV" is today. In the 21st century, "Direct TV" is the rage, which is an exact parallel of Tesla's "Direct Electricity."

Let us fulfill this prophesy of Tesla, making it a *triumphal success,* by supporting a philanthropic, international wireless power station installed on a remote island to electrify the whole world. The benefits, immediately making direct electricity available everywhere, are too numerous to count. (Coincidentally, in Tesla's homeland, the Electric Power Company of Serbia raised their monthly rates *by 50%* on the day *Harnessing the Wheelwork of Nature* was sent to the publisher, while California is now up to 15 cents per kWh, double the US average.)

Become educated about Tesla's wireless energy transmission discovery at http://users.erols.com/iri/tesla.htm and help celebrate the Wardenclyffe Tower Centennial at the Tesla Energy Science Conference, November 8-9, 2003 (www.IntegrityResearchInstitute.org).

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About the Author

Thomas Valone received his Master's in Physics from the State University of NY at Buffalo (1984) and his Ph.D. in General Engineering from Kennedy-Western University (2003). He taught physics, AC electricity, microprocessors, digital logic and environmental science at Erie Community College in NYS (1982-1987), and is the author of several books and about 100 articles and reports. Presently, Dr. Valone is President of Integrity Research Institute, a non-profit organization dedicated to energy research and public education.

Secrets of Nicola Tesla's Experiments

Sergey S. Makukhin, Russia

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At the close of the 19th century the great scientist Nicola Tesla gave to the whole world a demonstration of electrical power transmission using a single incomplete and unearthed wire. Nevertheless, the nature of this phenomenon remains obscure till nowadays. It is also known that Engineer Stanislav Avramenko succeeded to repeat the famous experiment. But as far as we know, mention of the physical nature of this phenomenon has been never made. The present article makes an attempt to explain how "it" works.

At the dawn of electrical science there occurred the idea of existence of a certain electrical liquid, which is able under certain conditions to flow from one body to another and to be both in abundance and in shortage. B. Franklin introduced at his time the notion of positive and negative electricity. J.C. Maxwell used in his theoretical investigations the direct analogy between water movement and electricity movement.

It is common knowledge that the electrical current is any movement of electrons (in this particular case – their movement in a metal), which happens when there is the potential difference. Is there an explanation of the movement of electrons in a single conductor?

As an example let us take an ordinary garden hose with some water inside it. Both ends of the hose are closed with plugs. How to make the liquid move? The only way is to start rotation of the liquid from one end so that to transmit its rotation to the other end of the hose. To make the liquid "move" it is necessary to establish an alternating current in the hose by moving the liquid alternatively from one end to another. But even in this case the water in the hose will not be moving the way we need. So, having pulled the plugs out, let us try to attach a vessel to each end of the hose (let the vessels have the form of a cylinder).

If we mount a plunger in one of the vessels and keep pushing it down we will make water in the hose move from the first vessel to the farther one (communicating vessels). Then if we pull the plunger up, as a consequence of wetting the plunger (water adheres to the plunger), water from the second vessel will flow through the hose back to the pump vessel.

If we continue the described manipulation then a water current of alternating direction will arise in the hose. In case if we manage to mount a screw with vanes (a propeller) inside the hose (in any of its point), it will rotate alternatively to both directions thereby proving the fact that moving liquid carries energy in it. A similar process takes place when we use a single wire.

As you know, the electroscope is an elementary device for detecting the presence of an electric charge. The simplest model of it consists of a glass jar with a plastic cap (an insulator). A metal stick is inserted into the jar through a hole in the middle of the cap. Over the cap there is a ball made of the same material as the stick itself.

There are lightweight strips of foil attached onto the lower end of the stick inside the jar and hanging one opposite to another. The strips can easily move attracting or repulsing each other. Let us remember that if we rub an ebony stick with a patch of wool, the stick will get charged. Then if we approach it to the upper part of the electroscope (to the ball) the foil strips in the jar will immediately move apart forming a certain angle and thereby proving that the electroscope has got charged.

When this procedure is finished, let us place another uncharged (with drooping strips) electroscope within the distance of three meters from the first one. Let us connect both electroscopes with a bared wire, holding its insulated middle part with our fingers. At the moment when the wire touches the upper balls of the both electroscopes we will see that the second (initially uncharged) electroscope will immediately "come alive" – its strips will set apart (forming a smaller angle than it was initially in the first electroscope) and the strips of the first electroscope will go a little down. Now the both electroscopes show the presence of charges that have been transmitted from the ball-capacity of the first electroscope to the ball-capacity of the second one.

The charges of the both electroscopes have equalized. It is clear that in this case electrons have flown from one electroscope to another and instantaneous current has arisen in the wire. If we obtain first charging and then discharging of the first electroscope from one end in constant duty, it will be evident that an electrical current of alternating direction will run in the wire between the electroscopes. Let us mention that the first electroscope is to be charged with one sign and discharged with the opposite one.

You can find a description of this process in any of full-length physics textbooks. But they never mention that it is possible to make the process constant or how it can be applied either. It seems to be strange enough that such a problem can bring many investigators to a nonplus.

To develop the subject, let us note that we can obtain the same continuos process (i.e. single wire excitation of alternating current) using the well-know method of electrostatic induction (field effect). For that it is enough to excite a near ball or sphere with a charged body, e.g. with a rubbed ebony stick. This effect must be alternating: sometimes by approaching, sometimes by taking the stick aside without touching the ball.

Theoretically nothing will change if we rotate (e.g. using a small motor) two electret balls of unlike charges located diametrically at the near sphere or ball. A current will run in the conductor from the near ball-capacity to the father one and back. It is viable to use an electrostatic machine (that will divide and accumulate charges of the opposite sign) or an electrostatic generator with line supply that will play the same part. In case if we supply alternately plus and minus charges from the electrostatic generator to the near sphere (we may obtain such alternation by using two relays or semiconductor switches), then electrons in the wire will run from the distant ball-capacity at supplying a plus charge and they will run back at a minus charge. We should mention that when potential difference arises in the wire then the strength of electrical field in our process becomes constant. Now when electrons have a place where they can flow to (to the balls-capacities) we may excite alternating current by applying the method of electromagnetic induction. In other words if a part of the conductor is coiled then forcing it dynamically with a magnet will entail the same result. Thus for this purpose one might use a transformer as well. The current can also result from exciting opposite ball-capacities in turns, i.e. from the both sides. In order to obtain a big potential of the ball-capacities (by their direct charging or using the method of electrostatic induction) we may apply a well-known principle of Van der Waals generator. By means of such a generator it is possible to obtain a potential of millions of volts and, consequently, rather high voltage.

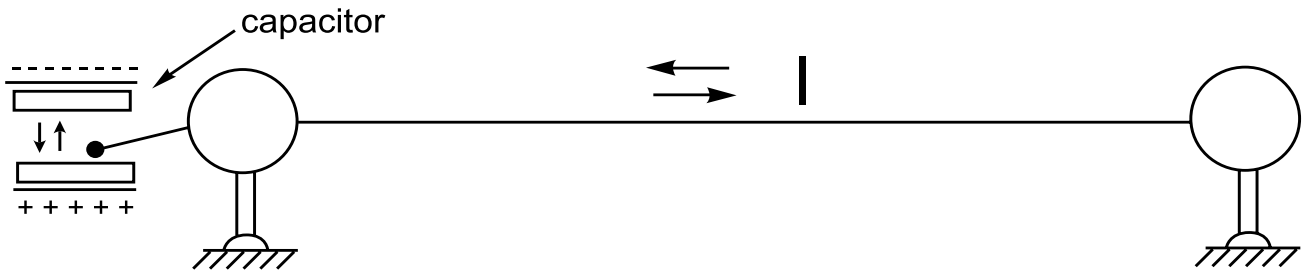

Fig. 1

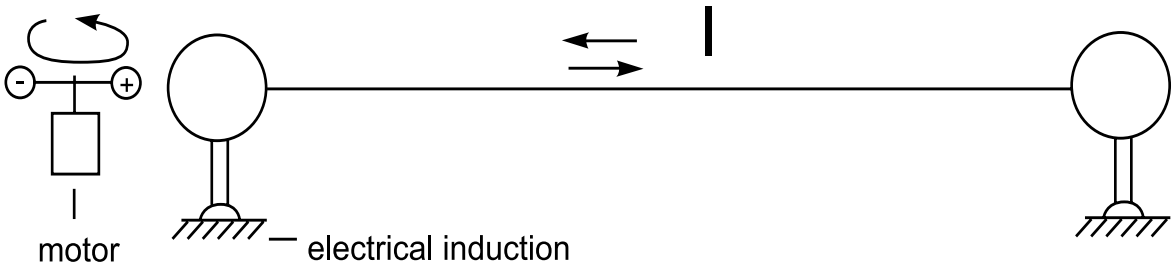

Fig. 2

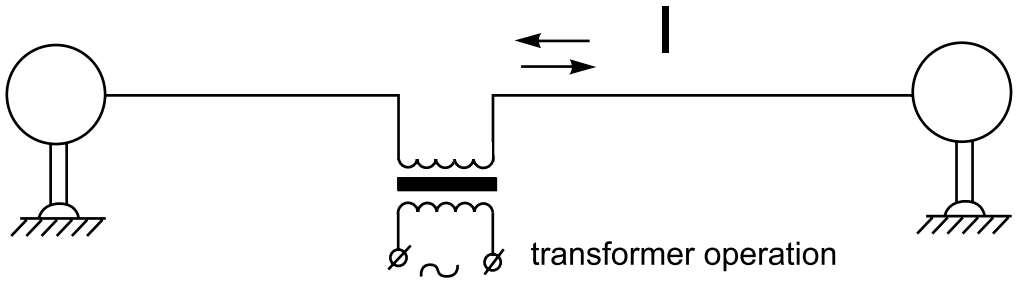

Fig. 3

In addition let us remind that lighting strikes sometimes from clouds (from above), sometimes upward from the earth and sometimes between thunderstorm clouds. This is one more indirect proof of the fact that it viable to transfer AC using a conductor. Besides it is also worth mentioning that alternating current can be transformed into direct current.

So if we install appropriate (new) generators to electrical power plants then old electrical power transmission lines will be able to transmit higher wattages than they transmit today because transmission of the same amount of power will require less quantity of wires (the rest of the wires will be released).

Using the abovementioned method it is possible to transmit electrical energy in the form of excitation of an electrical field from "this" side to any distant point of the planet. It is related with that the Earth is a large conductive globe (and a charged one), besides charges can be divided – polarized to opposite ones.

On the whole by receiving an initial signal by means of an appropriate receiver of the antipodal point we have obtained not only a way of power transfer, but also a way of information transmission. As we modulate a signal in one point, in the other point it is demodulated. Besides, the principle of modulation-demodulation can be applied to single-wire transmission as well. It should be noted that energy and information transmission is viable in case if we induce the magnetic field of the planet from "this" point".

We will not dwell on the "torsion" principle of single wire transmission of electrical energy (in this case both the electrical field and, correspondingly, electrons rotate from one end to another transmitting this rotation in a wire to its opposite end). Maximal length of the wire depends on the amount of a potential on the ball-capacity. The capacity itself depends on its own radius.

Let us consider some questions that N. Tesla probably never investigated. A hypothesis that may be working – that is to say a viable one – is presented below. The author carried out the following experiment. A cylindrical permanent magnet was suspended on a thread. When the magnet set still, another analogous magnet was carried to it at a certain distance. The second magnet was oriented towards the first one with its opposite pole.

At that there was observed a certain deviation of the first magnet. The first suspended magnet was fixed from both sides. So the magnet could move

only in one plane, strictly within the arch that depended on the radius of the suspension. Then the experimenter struck the field of the second intermediate stationary magnet (all the magnets were oriented one to another with opposite poles) abruptly with the field of a third magnet. As a result of it the first magnet, which was located on the other side of the intermediate stationary magnet, also bounced abruptly aside.

Most probably, there was a pulse transmitted in the magnetic fields of these interacting magnets. It reminds another well-known effect: if we place ten contacting balls in one line on a horizontal flat surface and hit the outermost ball, then nine balls stand still and the last ball on the opposite end rebounds.

If it is possible in case with the balls, then why should it be impossible with a row of magnets that are oriented with opposite poles one to another and are rigidly fixed to a flexible tube? If we run energy through this new "wire" by preliminarily exciting one of its ends with an abrupt pulse of the magnetic field, this energy may be received on the other end of the conductor with a magnetic field receiver. If we take a solid metal wire and magnetize it so that the field lines are oriented parallel to the field axe, in this case we will also obtain a new conductor able to play the mentioned role, that is to transmit a pulse through the magnetic field of the "wire" from its one end to another.

We can apply the same principle to like charged balls or more precisely to electret (like) balls or to an electret (solid) wire. But in this case we will have to "strike" with an electrical field from one side so that to transmit a pulse to the other end.

The author believes that realization of the idea described above will entail creation of a new generation of technical devices and that single wire transmission of non-mechanical energy is viable.

Alternative Refrigeration

Review by our correspondent Alla Pashova

Refrigeration is part and parcel of power engineering. It always presupposes that driving refrigerating machines require some energy. The power consumption of modern refrigerating machines ranges within several dozens of watts to thousands of kilowatts. The refrigerating capability of large refrigerating plants varies from hundred thousands to several millions of kJ per hour. That means their electrical energy inputs are great. But what will you say about a refrigerator that does not require electrical power supply? Is it science fiction? No, it is a reality!

Achievement of foreign investigators

A magnetic refrigerator has been designed and built by common efforts of scientists from Astronautics Corporation of America (http://www.astronautics.com) and Ames Laboratory (http://www.ameslab.gov). This refrigerator has a rotary configuration that consists of a wheel containing segments of gadolinium powder and a high-powered permanent magnet (Fig.1)

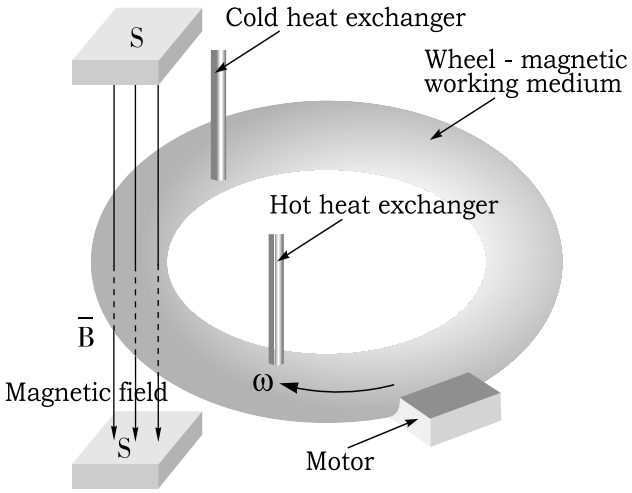

Fig. 1

The wheel is arranged to pass through a gap in the magnet where the magnetic field is concentrated. As the segment passes through this field, the gadolinium in the wheel exhibits a large magnetocaloric effect and as a result the segment heats up. After the gadolinium enters the field, water is circulated to draw the heat out of the metal. As gadolinium leaves the magnetic field, the material cools further as a result of the magnetocaloric effect of the opposite sign.

A second stream of water is then cooled by the gadolinium. This water is then circulated through cooling coils of the refrigerator. The overall result is a compact unit that runs virtually silent and nearly vibration free, without the use of ozone-depleting gases, a dramatic change from the vapor-compression-style refrigeration technology in use today.

"The permanent magnets and the gadolinium working medium do not require any energy inputs to make them work," – states Professor Karl Gschneidner, Ames Laboratory leading investigator, "so the only energy it takes is the electricity for the motors to spin the wheel and drive the water pumps."

Magnetocaloric effect (MCE) that lies in the heart of the magnetic refrigerator was disclosed as early as 1881. Its essence is in the ability of matters to heat and cool under the action of magnetic field. Changes in temperature are caused by energy redistribution between a system of magnetic moments of atoms and a system of magnetic moments of the crystal lattice.

Solid working medium of magnetic refrigerators serves as a refrigerant (freon or carbon dioxide). Magnetization and demagnetization are analogous to cycles of compression and expansion. A change in entropy per a unit of volume is seven times higher than in gases.

Theoretically magnetic refrigerators are to be the same times more compact. But their realization requires peculiar materials: high-powered

magnets and sensitive working media. Ames Laboratory scientists have been working at their creation. Two of their recent developments could lead to even greater advances on the magnetic refrigeration frontier.

Gschneidner and fellow Ames Laboratory researchers Sasha Pecharsky and Vitalij Pecharsky have developed a process for producing kilogram quantities of $Gd_5(Si_2Ge_2)$ alloy using commercial-grade gadolinium. $Gd_5(Si_2Ge_2)$ exhibits a giant magnetocaloric effect which offers the promise to outperform the gadolinium powders used in the current rotary refrigerator.

When the alloy was first discovered in 1996, the process used high-purity gadolinium and resulted in small quantities (less than 50 grams). However, when lower-quality commercial-grade gadolinium was used, the magnetocaloric effect was only a fraction, due mainly to interstitial impurities, especially carbon. The new process overcomes the deleterious effect of these impurities, making it viable to use less expensive commercial-grade gadolinium to achieve roughly the same magnetocaloric effect as the original discovery.

At the same time, Ames Lab researchers David Jiles and Seong-Jae Lee, along with Vitalij Pecharsky and Gschneidner, have designed a permanent magnet configuration capable of producing a stronger magnetic field.

The new magnet can produce a magnetic field nearly twice as high as that produced by the magnet used in the initial refrigerator, an important advance since the output and efficiency of the refrigerator is generally proportional to the strength of the magnetic field. The group has filed patent applications on both the gadolinium alloy process and the permanent magnet.

"These are important advances, but it will require additional testing to see how much they will enhance refrigeration capabilities," Gschneidner said. "Progress (in this field) is measured in small steps and this is just another of those steps. However, we have come a long way since first announcing the giant magnetocaloric alloy five years ago."

To celebrate another step forward Ames Laboratory scientists used their magnetic refrigerator to demonstrate cooling of a bottle of Champagne to the audience at Big Eight Conference in Detroit.

According to eyewitnesses, the demonstrated refrigerator did not look like having been finished by industrial designers. It had the form of a box about 50 cm high and 50 cm wide with tubes and wires connected to a 6V battery. The sides of the box were transparent so the audience could watch the device rotating. There was an electronic thermometer connected to the prototype that monitored refrigeration speed: roughly 2 degrees per minute.

The Ministry of Power Engineering of the USA and NASA have been financing research work in the field of magnetic refrigeration for 20 years. The demonstrated domestic magnetic refrigerator has been already called "the most dramatic advance in today's power engineering of the USA".

Russian projects

Russia does not look like joining these engineering races. The Russian Minister of Power Engineering is far from being enthusiastic about the competition "Who is the First to Built a Magnetic Fridge?» (His American colleague, conversely, was impressed by the mentioned working prototype). However Russian tardiness is not as great as it may seem. The fact is that our specialists took active part in developing magnetic fridges.

They investigated concurrently with Ames Laboratory by means of the same scientific grants. Moscow State University (Faculty of Physics) still holds the lead in fundamental investigations in this field. Specialists of the faculty worked out efficient alloys for working media of magnetic refrigerators much earlier than their American confreres.

Moreover, several free-lance experimenters have been carrying out their own research. G.M. Kuznetzov (Honoured Inventor) and A.N. Zagnetov (Candidate of Technical Sciences) have been cooperating about eight years.

They have offered a number of technical projects in the field of power engineering, transport, raw materials extraction and processing. At the website http://re-energy-tran.narod.ru they try to bring attention of investors to their engineering solutions: "While many countries of the world are spending dozens of years and dozens of milliards of dollars on developing technologies of the kind, using technical equipment and highly qualified personnel of hundreds and thousands of research institutes, the authors have succeeded to create these practically "homemade" devices without federal, regional or sponsor financing». One of their developments is an "alternative" refrigerating plant

with output > 100%, that does not require electrical energy supply.

«Today we have all prerequisites at both theoretical and practical levels that make it viable to solve the problem of converting low-temperature scattered heat into electrical energy" – the authors state. The Table given below presents comparative analysis of the refrigerator "ZIL" and the new model according to some of their specification figures:
As it is evident from the Table, the alternative

№	Specification	Model	
		ZIL	New model
1.	Refrigeration output	1.0	100.0 and more
2.	Power Consumption, W	150.0	6.0
3.	Weight of the refrigeration unit, kg	18.0	26.0

refrigerator is rather lightweight and requires practically no power supply to make it work. The only energy it takes is the electricity to make it start. The authors promise: if someone invests a million dollars in their development, the project will be realized within a year and the expenses will be covered within eight months. As for magnetocaloric effect, the Russian leader in its studying is the company "Advanced magnetic technologies and consulting" (http://www.ndfeb.ru). Alexander Tishin, Doctor of Physics and Mathematics and chief of the laboratory of Faculty of Physic (Moscow State University), heads the company. Researchers of the company are co-authors of over 70 scientific works in this field and holders of five certificates of recognition and patents. *(Editor's: Read the article by E.N. Tishina for more detailed information on the projects of "Advanced magnetic technologies and consulting" Co).*

Concurrent investigations or original projects?

If Russian physicists do not succeed either in the application of magnetocaloric effect at the international level or in developing Russian analogue of the magnetic refrigerator, perhaps, it is expedient to recollect well-forgotten old projects of Soviet times? It is viable to totally eliminate energy inputs of standard refrigerating machines (that use refrigerants) in case if we do certain technical upgrades (incidentally, such upgrades are invented ages ago). So the machines will turn into free-running refrigerators, or alternative magnetic refrigerators that require neither expensive nor exotic materials.

Doctor of Technical Sciences V.A. Zysin got his certificate of recognition # 591667 as early as in 1978. It was a description of his non-drive refrigerator that worked using the heat of cooled bodies. Zysin's refrigerators operated by means of "triangle cycles" invented by him. Since 1962 they were manufactured in small lots. Their operation did not need any energy inputs.

Standard refrigerating cycles comprise expansion of refrigerating liquid and compression of product vapours followed by their condensation. Operation cycles of the kind do require energy inputs. In the upshot both consumed energy and internal energy of the working medium are released outside. This disadvantage is partially neutralized when the working medium is cooled using an advanced cycle that integrates the following processes:

- expansion of refrigerating liquid and doing work of the expansion,
- compression of product vapours followed by their condensation,
- rising the pressure of the residuary liquid phase up to its condensation pressure,
- the liquid phase takes off the heat of the cooled medium and heats immediately up to its condensation temperature,
- the liquid phase is mixed with the liquid

generated as a result of the condensation of vapours.

V.A. Zysin offered to improve this rather an uneconomical method. For that it was necessary to provide more effective use of the heat of cooled media for doing work. Before cooling in a refrigerating cycle, the temperature of working medium dropped down to a temperature exceeding the temperature of ambient air.

The released heat was engaged in an auxiliary expanding cycle with doing work. At the same time the lowest and the highest temperatures of the auxiliary expanding cycle were kept at a certain level (so that the sum of output works in the both cycles of operation would exceed the sum of input works in the same cycles).

V.A. Zysin's refrigerating machine consists of two circuits: a refrigerating cycle and an expansion one. The expanding circuit comprises an expander (1), which outlet is connected to a separator (2). The vapour line of the separator (2) is connected to the inlet of a condenser (3). The liquid line is connected to the outlet of the condenser (3) and to a transfer pump (4). The outlet of the pump (4) is connected to a heat exchanger (5). The refrigerating cycle contains an expander (6) connected to a separator (7). The vapour line of the separator (7) is connected to a condenser (9) through a compressor (8). The liquid line of the separator (7) is connected to a heat exchanger (11) through a transfer pump (10).

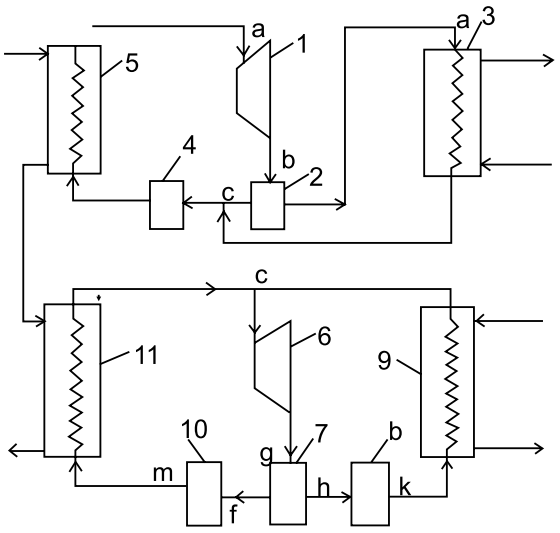

Fig. 2

The device operates as follows: in the expanding cycle refrigerating liquid is expanded using the expander (1) up to a temperature exceeding the temperature of ambient air. The separator (2) separates a vapour phase out of the generated liquid-vapour mixture. The vapour phase is condensed in the condenser (3). Then it is mixed up with residuary liquid phase, transferred by means of the pump (4) and heated in the heat exchanger (5) without changing its aggregative state.

In the refrigerating cycle the refrigerant is expanded using the expander (6). The generated liquid-vapour mixture is separated with the separator (7). The separated vapour phase is compressed in the compressor (8) and condensed in the condenser (9). The liquid phase is transferred by means of the pump (10) and heated in the heat exchanger (11) without changing its aggregative state until its temperature exceeds the temperature of ambient air. The heated liquid phase is mixed with condensed vapours and the refrigerating cycle is repeated once again.

Cooling is effected in the heat exchangers (5, 11) by means of refrigerants. Energy for driving all the pressure machines of the cycle (pumps 4, 10 and compressor 8) is generated with the expanders (1, 6). To simplify the device we can replace the expander (6) with a throttle.

Refrigeration of working medium without energy inputs is viable under the following conditions. In the expanding cycle output of the expander is 0.65, output of the pump is 0.80 and the output of the compressor is 0.85. The expander of the refrigerating cycle is replaced with a throttle. The temperature of outer working medium drops from 363° K down to 283° K (while the temperature of ambient air is 293° K). If the lower temperature of the expanding cycle and the higher temperature of the refrigerating cycle are kept at the level of 301° K, then output work of the expanding cycle will exceed the sum of input works of the both cycles.

Hence, it was possible to build refrigerating plants requiring no energy inputs on the basis of the scheme offered by V.A. Zysin and his colleagues from Polytechnic Institute as early as in 1978. If today's manufacturers of refrigerating devices do not dare to finance the application of magnetic refrigerators, why not they start series production of free-running refrigerators designed by V.A. Zysin? It will result in dramatic reducing the amount of power consumption for domestic and industrial refrigeration.

Will Russia Develop a Challenging Technology of Magnetic Refrigeration?

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Up to the present day the problem of magnetic refrigeration is solved in our country only at a level of research laboratories. Though in the beginning of 90s Russian scientists carried out the first investigations on the theory and practice of application of the magnetocaloric effect (MCE) to magnetic refrigerating machines. In particular, the Faculty of Physics under the direction of A.M. Tishin, Doctor of Physics and Mathematics (Moscow State University) for many years has been searching optimal materials for magnetic refrigeration within various temperature ranges. The investigators have fulfilled serious analysis of numerous combinations of rare earth and magnetic metals and other substances. It has been found that the alloy of rhodium and iron $Fe_{49}Rh_{51}$ has the maximal known specific MCE several times exceeding the MCE of the materials that are usually used in the investigations on magnetic refrigeration.

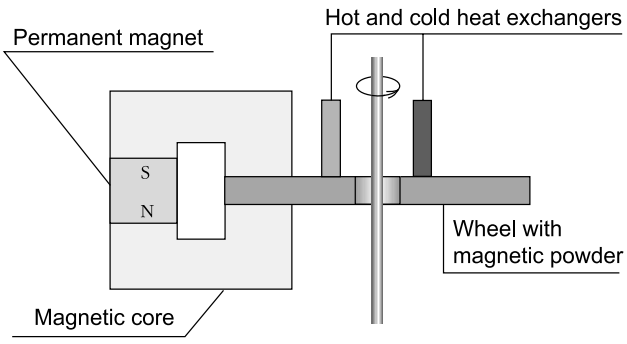


Fig. 1

Principle of operation of a magnetic refrigerator
http://www.ndfeb.ru

One of the major research and development activities of Advanced Magnetic Technologies and Consulting Co Ltd (AMT&C) is creation of new magnetic materials suitable for using as working bodies in magnetic regenerators. The company keeps in touch with scientists working in this field in a number of universities and national laboratories of the USA, Europe and China. At present the company holds one of the largest collections of works on the magnetocaloric effect (about 500 copies of articles, reports, etc). Researchers of the company are co-authors of over 70 scientific works in this field and holders of five inventor certificates and Russian Federation patents in this field. A number of fundamental reviews on the magnetocaloric effect and magnetic refrigeration have been published abroad in various books and encyclopedias. In 2003 the Institute of Physics (Oxford, UK) is going to publish the following book by leading scientists of the company: A.M. Tishin, Yu.I. Spichkin, The Magnetocaloric Effect and Its Applications.The company is also engaged in development and manufacture of experimental equipment for measuring magnetocaloric characteristics within the temperature range from 5 to 500 K and more. AMT&C employees have recently applied for 8 Russian Federation patents.

In December 2001 the company got a Russian Federation patent for the invention of *"Working body for magnetic refrigerators made on the basis of magnetic polynuclear complexes".*

The invention has to do with refrigerating equipment and can be applied to magnetic refrigerating machines operating at temperatures below 20 - 50 K. The inventors offer to use a superparamagnetic material based on magnetic polynuclear complexes of transition metals as a working body in magnetic refrigerators. This material is characterized by a high capacity to change the magnetic part of entropy under the action of a magnetic field. It is essential for increasing the efficiency of operation of magnetic refrigerators at temperatures below 20 - 50 K. The working body is a magnetic powder material. Its originality consists in using superparamagnetic polynuclear complexes of transition metals as a

magnetic material for the sake of higher effectiveness. The polynuclear complexes contain 3d transition metals (such as Fe, Ni, Mn, Cr) and 4f transition metals (such as the rare-earth metals Nd, Gd, Tb, Tm or their alloys). The mentioned polynuclear metal complexes are used in a free form and applied onto a non-magnetic high-porous supporter such as Al_2O_3 or SiO_2. Creators of the abovementioned working prototype of a magnetic refrigerator have been cooperating with researchers from Advanced Magnetic Technologies and Consulting Co Ltd and the Faculty of Physics (Moscow State University) for many years. To our regret, Russian scientists have not enough funds for carrying out development work of the kind. Beyond any doubt, if federal or commercial structures provide their appropriate financial support it will be possible to develop such a technology and start manufacturing magnetic refrigerators in Russia. To our mind, in the nearest future all the interested parties should be engaged in investigations on magnetic refrigeration.

News Review

Energy generation by using of atmospheric oxygen and solution of table salt

http://www.regnum.ru/expnews/95069.html,

http://www.cktvvc.ru/start_ielm.asp

Chemical electric power supply of a new kind was created in the "Uralelement" factory (Russia). It is metal-air current sources (MACS). The main advantage of the novelty is that there are no electrodes with oxidants in it, which define electric capacity of the most of batteries. Oxygen of a common air is used as oxidant and solution of table salt is used as electrolyte that provides environmental safety of the invention. These current sources *do not require to be recharged from the electrical supply network* and their operation life comes to 5 thousand hours. According to the estimations of specialists, this invention clears new way for autonomous power engineering and is very promising.

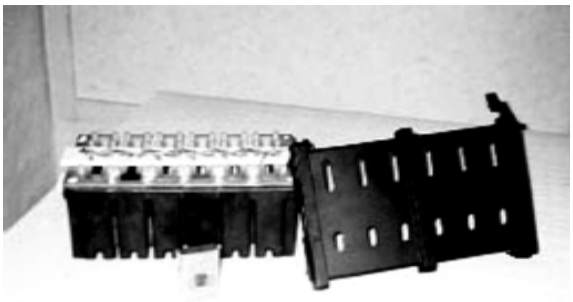


Fig. 1

As compared with nonreusable galvanic elements and different accumulators, which require to be recharged from the electrical supply network, MACS-batteries are fundamentally new pollution-free current sources, which do not require to be recharged from the electrical supply network. Their recharging is realized by mechanical changing of anodic plates and simultaneous replacement of the salt electrolyte, which at discharging consumes water and is densified by reaction products (they are derived at consumption of anodes). Water solution of table salt serves as electrolyte. Concentration of salt comes to 120-170 g/liter. It is possible to use water from any reservoir as well as seawater.

Positive electrode is gas-diffusion one. It is nonconsumable and allows using atmospheric oxygen as oxidant. Negative electrode represents a plate made of magnesium or special-property aluminum alloy.

At present, Moscow "Center for commercialization of technologies" offers different electro-batteries consisting of MACS to its customers. Such electro-batteries could be used in private life as home electric power stations or autonomous power sources.

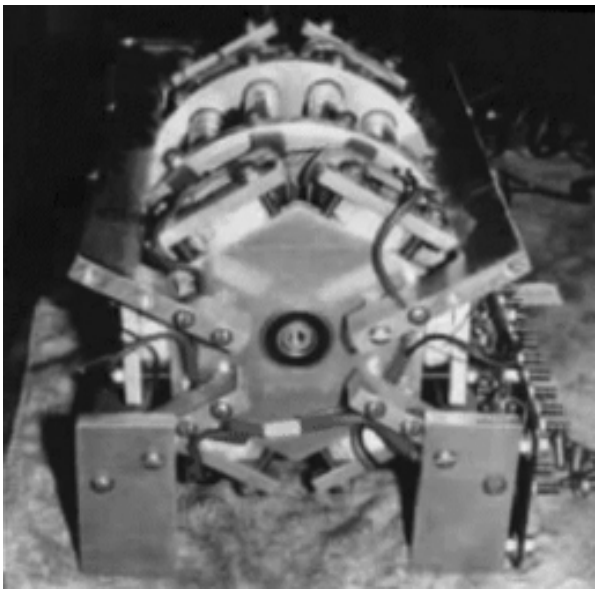
Interference Disc Electric Generator

Alan L. Francoeur, Canada

Email: al.f@shaw.ca

http://www.fortunecity.com/greenfield/bp/16/interference.htm

Editor: Read more on the device and experiments by Alan L. Francoeur in the next issue of our magazine.



Interference disc electric generator is an improved version of the Ecklin generators. It seemed logical that to produce electricity more efficiently the design of the generator had to be altered to rotate less internal mass with a balanced rotor disc. At the same time it has to allow for a collapsing magnetic field within the coils without rotating the magnets or the coils.

Using more powerful neodymium magnets and amorphous coils, the system was designed in such a way as to allow the flux to circulate in a magnetic loop while incorporating magnetic shielding. Some simple experiments with magnetic shielding were performed. At that iron strips, ceramic magnets and small transformers were used. The magnets and the transformer were positioned stationary opposite of each other with an air gap between the magnet and the transformer.

Once the apparatus was assembled the author proceeded to move the metal strips in and out of the air gap between the magnet and the transformer which has produced an AC pulse in the stationary coil. Using this principal and refining the design there was built a mechanical device incorporating magnetic shielding into the design. It was named the Interference Disc Generator being that the metallic thin iron disc interrupted the magnetic field in the air gap (neutral zone) between the coils and magnets.

This method is unique in that it produces electricity with greater efficiency due to both the magnets and coils being stationary, brushes and a commutator in this design are not needed and it requires very little startup torque.

Howard Johnson Motor

Review prepared by our correspondent Alla Pashova

In April 1979 Howard Johnson patented a motor, which operates on permanent magnets (# 4,151,431). It is an object of the invention to utilize the magnetic spinning phenomenon of unpaired electrons occurring in ferromagnetic material to produce the movement of a mass in a unidirectional manner as to permit a motor to be driven solely by magnetic forces as occurring within permanent magnets. In the practice of the inventive concepts, motors of either linear or rotative types may be produced. It is an object of the invention to provide the proper combination of materials, geometry and magnetic concentration to utilize the force generated by unpaired electron spins existing in permanent magnets to power a motor.

Whether the motor constitutes a linear embodiment or a rotary embodiment, in each instance the "stator" may consist of a plurality of permanent magnets fixed relative to each other in space relationship to define a track, linear in form in the linear embodiment, and circular in form in the rotary embodiment. An armature magnet is located in spaced relationship to such track defined by the stator magnets wherein an air gap exists therebetween. The length of the armature magnet is defined by poles of opposite polarity, and the length of the armature magnet is disposed relative to the track defined by the stator magnets in the direction of the path of movement of the armature magnet as displaced by the magnetic forces.

The stator magnets are so mounted that poles of like polarity are disposed toward the armature magnet and as the armature magnet has poles which are both attracted to and repelled by the adjacent pole of the stator magnets, both attraction and repulsion forces act upon the armature magnet to produce the relative displacement between the armature and stator magnets.

The continuing motive force producing displacement between the armature and stator magnets results from the relationship of the length of the armature magnet in the direction of its path of movement as related to the dimension of the stator magnets, and the spacing therebetween, in the direction of the path of armature magnet movement.

This ratio of magnet and magnet spacings, and with an acceptable air gap spacing between the stator and armature magnets, will produce a resultant force upon the armature magnet which displaces the armature magnet across the stator magnet along its path of movement.

In the practice of the invention movement of the armature magnet relative to the stator magnets results from a combination of attraction and repulsion forces existing between the stator and armature magnets. By concentrating the magnetic fields of the stator and armature magnets the motive force imposed upon the armature magnet is intensified, and in the disclosed embodiments such magnetic field concentration means are disclosed.

The disclosed magnetic concentrating means comprise a plate of high magnetic field permeability disposed adjacent one side of the stator magnets in substantial engagement therewith. This high permeability material is thus disposed adjacent poles of like polarity of the stator magnets. The magnetic field of the armature magnet may be concentrated and directionally oriented by bowing the armature magnet, and the magnetic field may further be concentrated by shaping the pole ends of the armature magnet to concentrate the magnet field at a relatively limited surface at the armature magnet pole ends.

Preferably, a plurality of armature magnets are used which are staggered with respect to each other in the direction of armature magnet movement. Such an offsetting or staggering of the armature magnets distributes the impulses of force imposed upon the armature magnets and results in a smoother application of forces to the

armature magnet producing a smoother and more uniform movement of the armature component.

In the rotary embodiment of the permanent magnet motor of the invention the stator magnets are arranged in a circle and the armature magnets rotate about the stator magnets. Means are disclosed for producing relative axial displacement between the stator and armature magnets to adjust the axial alignment thereof, and thereby regulate the magnitude of the magnetic forces being imposed upon the armature magnets. In this manner the speed of rotation of the rotary embodiment may be regulated.

Special magnets of curved shape are used in the device (see Fig. 1). Force vectors of each magnet are directed in such a way as to create constant torque. *Power of the working prototype comes to 5 kWt.*

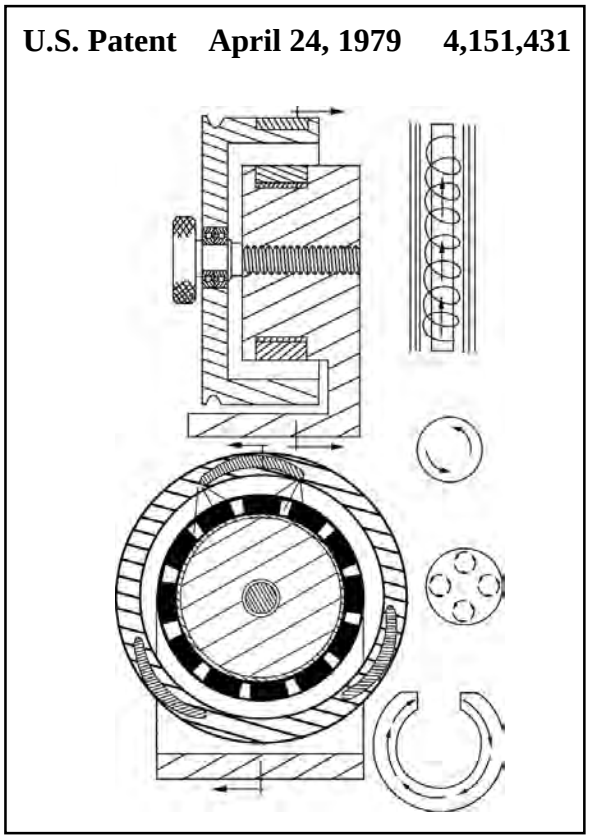


Fig. 1

In Howard Johnson patents there is a detailed description of his devices:

- U.S. patent number 4,151,431 "Permanent magnet motor" (April 24, 1979)

- U.S. patent number 4,877,983 "Magnetic force generating method and apparatus" (October 31, 1989)

- U.S. patent number 5,402,021 "Magnetic propulsion system" (March 28, 1995).

Nowadays there are may be found many publications by authors who tell about their attempts to reproduce Howard Johnson motor. For example, Steven Walker made a device, which was working within two months.

An American engineer (unfortunately, only his name – Richard is known) gathered a group of like-minded people in order to reproduce the device using standard units. More detailed information is presented at the webpage devoted to the researches by Tom Berden: http://www.greaterthings.com/News/FreeEnergy/Directory/Howard_Johnson_Motor/TomBearden/index.html.

Not long ago a researcher Douglas Mann published original drawings of the motor (http://www.greaterthings.com/News/FreeEnergy/Directory/Howard_Johnson_Motor/Douglas_Mann/index.html):

Fig. 2

This figure of the motor was published in Science & Mechanics magazine (USA) in 1980 along with a brief article about this amazing motor, which generates energy only by means of permanent magnets.

Editors of New Energy Technologies magazine will be glad to receive comments to this publication from the authors who try or already have reproduced Howard Johnson motor.

Centrifugal Generator by Bogomolov

Vyacheslav I. Bogomolov, Russia

In the article by V.I.Bogomolov there is considered a physical principle to generate excess mechanical energy. Details of construction allow accelerating the rotor of the generator with no use of external power source. We are working at realization of this idea. Please, send your comments to the following address: Faraday Lab Ltd, Lev Tolstoy Str. 7-601, 197376, Saint-Petersburg, Russia.

Design of the device is presented in Fig. 1. Watt centrifugal governor is mounted at a shaft of a reversible electrical machine (motor-generator). The centrifugal force of inertia $\mathbf{F_{cen}=m\omega_1^2R_1}$ appears when there is reached a definite angular speed $\boldsymbol{\omega_1}$ of the loads, which rotate at the shaft and have total weight **m**. This force of inertia *allows the work of centrifugal forces* $\mathbf{A_{cen}=FR_1}$, i.e. it moves apart weighted levers at a maximal radius of curvature of rotational trajectory $\mathbf{R_1}$. At that a spring is contracted. The electrical machine works in a mode of "motor" and, consuming some power from batteries, it converts electrical energy into kinetic one. It is clear that real motors always require some input to generate rotation but amount of energy input can be very small as to be compared with a result (contraction of the spring).

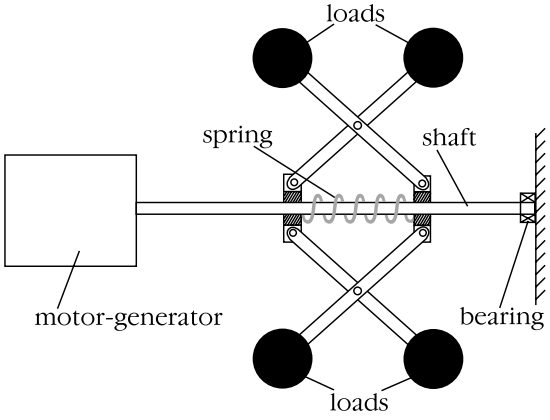


Fig. 1

At the second stage of the device operation, the machine works as a generator. Decreasing of speed of rotation of the loads $\boldsymbol{\omega_1}$ causes stretching of the spring and return of the stored energy $\mathbf{E_k}$, which is converted to the torque of the shaft of a generator. Let us explain it by an example. By analogy with the rotary acceleration made by a figure skater whose arms are clasped to the body and by virtue of law of conservation of angular momentum (angular momentum $\mathbf{L=mR^2\omega_1=const}$) the work of the spring, which was cocked at the first stage, will cause increase of kinetic energy and increase of angular speed of these loads. This work is made to transfer masses of the loads **m** at the radius of curvature $\mathbf{R_1\text{-}R_2}$ against the centrifugal forces $\mathbf{F_{cen}}$.

$$\mathbf{W=1/2mR_1^2\omega_1^2\text{-}1/2mR_2^2\omega_2^2} \qquad (1)$$

$$\mathbf{\omega_2=mR_1^2/mR_2^2} \qquad (2)$$

This is the very energy, which a consumer gets "free of charge". At that some losses are also possible, according to the parameters of the really applied electrical machine.

As a result of operation of the device for two stages, **at the end of the second stage we will get an increment to the returned energy**, which was consumed at the first stage. In other words there is an increment of power of the device by means of free energy of the medium of physical vacuum (aether).

Theoretically, according to the hypothesis by an author [2], an artificial system of rotation of loads creates a subsystem in the structure of elements of the medium of physical vacuum. This subsystem is named "potential field of centrifugal forces of inertia" PCFI (or organizational form of matter OFM by B.P. Ivanov [1]). Nature of this artificial field is similar to the nature of gravitational, electrostatic and magnetic fields. In other words *PCFI is a potential well for energy.* The loads "fall" in it "free of charge" like a man falls in a well. And to get out of this "well" it is necessary to make some work. Source of energy increment of the device is a spring, which was "cocked" at the first stage during "falling" of the loads in the potential well of energy of PCFI.

If the reversible electrical machine gives us back (less the losses) input energy for two stages of the action, then where the force and power budget of the artificial OFM for the "cocked" spring comes from?

By the inertia of the system of mass of the loads, kinetic energy of rotation is accumulated (turns from electrical one). It is possible since elastic forces of the levers make some work to change linear tangent vectors of impulse (instantaneous orbital speed) of masses of the loads at the radius of their inertial motion.

Source of power of the action of Coulomb and Van der Waals forces (i.e. forces of structural integrity of a matter of the levers) is in the same perpetually moving material substance, which surrounds us, i.e. in the medium of physical vacuum. As shown in [1], every material particle is a subsystem of the physical vacuum. It represents a vortex of the organizational form of matter of locally concentrated elements of aether substance (one might say a "stored energy of medium structure"). This energy causes additional deformation of the structure of physical vacuum and generation of the power budget of the artificial field of inertia of centrifugal forces around matter of the loads.

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Saint-Petersburg: Politehnika, 2000

2. V.I. Bogomolov. Paradigm of the physical vision of the world ("matreshka"). Principle scheme of utilization of energy of conservative fields, Collection of articles of the International Academy "Information, communication, management in engineering, nature, society") "Problems of space safety" Saint-Petersburg, 2002.

News Review

Sensational discovery by American scientists

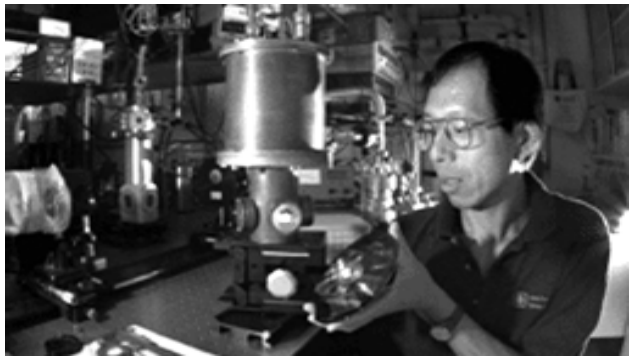
Revolutionary tungsten photonic crystal could provide more power for electrical devices

http://www.sandia.gov/news-center/news-releases/2003/other/planck-lin.html

Researchers at Sandia National Laboratories have shown that filaments fabricated of tungsten lattices emit remarkably more energy than solid tungsten filaments in certain bands of near-infrared wavelengths when heated.

This greater useful output offers the possibility of a superior energy source to supercharge hybrid electric cars, electric equipment on boats, and industrial waste-heat-driven electrical generators. The lattices' energy emissions put more energy into wavelengths used by photovoltaic cells that change light into electricity to run engines.

Because near-infrared is the wavelength region closest to visible light, the day may not be distant when tungsten lattice emissions realized at visible wavelengths provide a foundation for more efficient lighting — the first significant change in Edison's light bulb since he invented it.



Magnetic Motor

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A motor (МПК F03 G, 7/00) converts energy of permanent magnets into mechanical work, at that direct propulsion force is created. This force causes not rotational but progressive motion. The motor is assembled of permanent magnets placed in the housing made of diamagnetic or paramagnetic materials. These materials have no impact on the forces of interaction of magnetic poles, since they are not magnetized and magnetic fields run through them almost as easily as air does.

Magnets are arranged in stages in such a way as to face each other with unlike poles in each stage. By means of mutual attraction of magnets in the stages, the device is in neutral position. Then magnetic inserts are placed in the stages next nearest. The magnetic inserts face main magnets with unlike poles. The stages with inserts interlace the stages with no inserts. To produce propulsion force the magnetic inserts are simultaneously displaced to the adjoined stages where they face the main magnets with like poles. At that mutual attraction of the magnets in these stages is discontinued. Each magnetic pole of this stage is between like and unlike poles of the adjoined stages, which due to mutual attraction of the magnetic fields represent balanced power circuits. On colliding each other, the like magnetic fields of the main magnet and of the insert repel from the like and attract to the unlike pole of the balanced stages.

At mutual repulsion and attraction of the magnetic fields of the stages with inserts and balanced stages, different directions of vectors determine the difference of forces with which they act *in opposite directions.* The sum difference of forces acting *in opposite directions* of all the stages of the device is equal to the total direct propulsion force. Since magnetic stages are immovable, the whole rigidly fastened device (i.e. magnetic motor) is turned in the direction of action of their forces.

Another version of the motor is a device in which magnets are placed in circular stages (Fig. 1). At that the shape and size of the device are changed and the construction has a shape of a cylinder. However the general way of operation of the motor is the same.Technical and economic efficiency of the magnetic motor is determined by its general characteristics. It is easy in operation, safe and durable. At producing of permanent magnets certain energy consumption will be required, but resources of the motor will be worked out until the hard magnetic material is demagnetized that will take several tens of years.

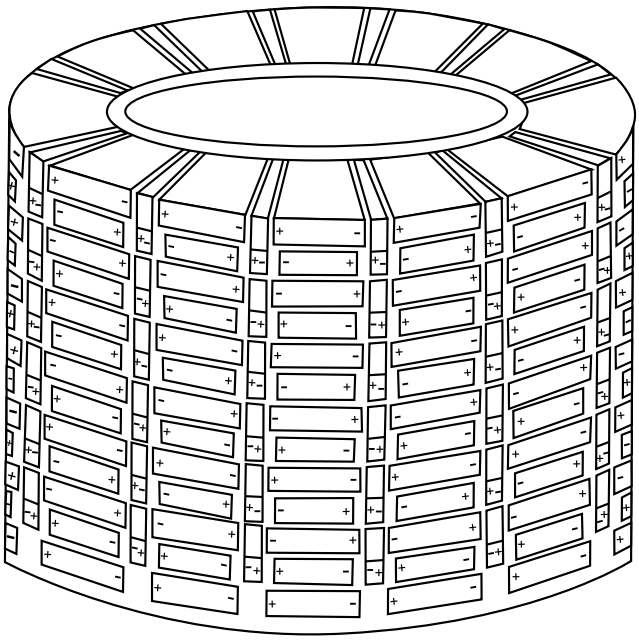

Fig. 1

Water-Hydrogen Reactor "OMEGA"

Releasing Water Energy: Method and Device

Editor's: The author asked not to mention his name in the publication. You can get in touch with him by this e-mail: energy-omega@mail.

The invention has to do with energy generation, in particular, with releasing thermal energy out of water (e.g. out of dissociated electrolyte or heavy water). This type of energy **Σ** is virtual to the energy of atom bonds of a liquid in case of inertial (thermoionic) explosion of the later.

Technically, the present invention makes it viable to generate energy (in the form of kinetic energy of explosion products) by means of inertial (thermoionic) explosions of a prepared liquid. The amount of energy **Σ**, generated as a result of application of the offered invention, exceeds electrical power inputs **w** many times. The released energy can be easily converted into useful kinds of energy (electrical and rotary ones).

The essence of the invention is in releasing internal energy of water by means of making it ready to detonate under the action of artificially evoked anomalous physical phenomena followed by an explosion.

> *The method of energy generation out of water without intermediates lies in forming of a directed flow of liquid in order to bunch free electrons in this flow...*

According to the quantum theory, if we manage to regulate somehow a cloud of electrons, kinetic energy of these electrons will increase. In other words, we only need to group at least a part of free electrons by bunching them, for example, into a directed flow and like ions will immediately leave points of the lattice, repulsing one another.

That is why lattices are always ready to explode. We may use one of the three forces – electrical, quantum or mechanical one – to explode a lattice of liquids by acting just upon its free electrons. Observations and experiments by V.Yavorsky, Doctor of Technical Sciences and Academician of Russian Academy of Missile and Artillery Sciences, prove that released thermal energy exceeds kinetic energy of primer explosive. Thus the effect depends on kinetic energy of a matter (primer explosive).

One of the earlier known analogues ("Method of releasing bond energy out of electroconductive materials" by M. Marakhtanov and A. Marakhtanov (Rospatent, Abstract #2145147) patented in 2000) has served as a prototype. However this method is applicable only to the materials with hard lattices.

In the investigation in question there have been also used the following known methods and effects: Method of obtaining high and ultrahigh pressures in liquids (L.A. Yutkin, inventor certificate # 105011, priority starting from April 15, 1950); Generation of plastic bodies by means of a high energy hydraulic impact (USA patent #3566447), according to which the speed of a jet directed to crude products is from 100 to 10000 m/sec; Photohydraulic impact (A.M. Prokhorov, G.A. Askaryan and G.P. Shapiro, invention #65); Method of hydrogen generation (Rospatent, Abstract #97116916), and "Electrohydrogen Generator (EHG)" (international patent application RU98/00190 dated on October 7, 1997, Russian patent #2174162 dated on September 27, 2001).

The method of energy generation out of water without intermediates lies in forming of a directed flow of liquid in order to bunch free electrons in this flow. The method has the following particularities:

1. When flow of a liquid accelerate up to the speed of partial bunching of free electrons and stop instantaneously, they release gases. That means they also release some energy followed by an explosion;

2. Contradirectional liquid flows, after being accelerated up to the speed of partial bunching of free electrons and before colliding one with another, pass through contact nozzles. A high-voltage electrical potential is imparted to the contact nozzles. As a result of it, when the flows collide in the jet there arises an electrical charge, accompanied by plasma generation and an energy release (an explosion);

3. A jet of the liquid forms in the flow and it accelerates up to the speed of bunching of the part of free electrons. The jet is in motion (it is virtual to a part of a conductor that is ready to explode at any moment). Detonation pulses act periodically upon the jet and cause its explosion;

4. It is possible to accelerate flows of liquids up to the speed of bunching of the part of free electrons using either a mechanical method or an explosive, or electrohydraulic impact, or a quantum pulse;

5. The detonation force that acts upon the jet can be evoked by means of either an explosive or an electrical charge, a quantum or a magnetic pulse;

6. Hydrogen and oxygen are released when an electrical current runs through the formed jet or there is a load resistance connected to the circuit;

7. A hydroturbine and/or a hydropump and/or a reactive drive can create the flow of circulating liquid where the jet is formed.

The anomalous water-hydrogen reactor "Omega" contains a round reservoir with unlike current conductive elements contacting with the circles of a rotating torus of a liquid. The device has the following particularities:

1. The liquid accelerates and rotates by means of a reactive drive that uses energy, which is generated in an omega-shaped device. The effect arises due to acceleration of the liquid up to the speed of bunching of the part of free electrons. When the electrons collide they release some energy followed by an explosion;

2. The liquid accelerates and rotates by means of a reactive drive that uses energy, which is generated when the main flow makes a peripheral one accelerate. The peripheral flow forms a jet, which is accelerated to the speed of bunching of the part of free electrons and is in spatial motion (a part of a conductor is formed). Denotation forces act periodically upon the jet and cause its explosion;

3. Electrical discharges arise under the action of electrical power of a capacitor. The energy results from potential difference of the circles of the torus of liquid;

4. The acceleration and rotation of the liquid as well as an extra detonation of the formed jet result from exploding a bled fuel mixture, generated in the device;

5. The exterior ring of "Omega" can operate as an independent energy generator. Thanks to concurrent effects the device can be used as a hydrogen and electrical power generator.

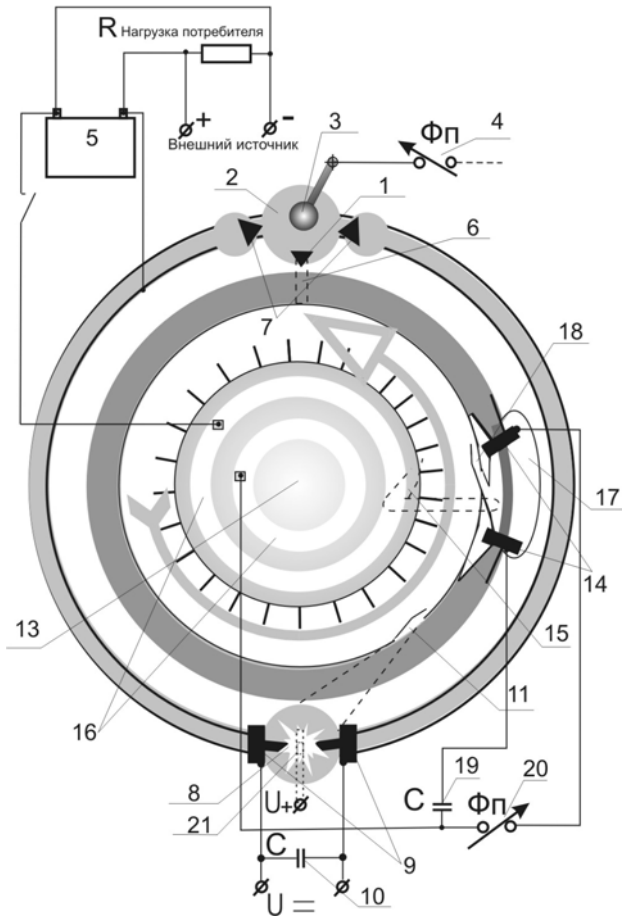

Fig. 1

Fig.1 (simplified circuit diagram of the device) illustrates the method. The device consists of a static toroid or a plate filled with a liquid (its rotating sense is marked by an arrow), e.g. with a solution of disassociated electrolyte.

Rotating sides of the circles of liquid contact with unlike current conductive elements (e.g. with the fins of a turbine (13) and internal periphery of the reservoir).

When the electrical circuit is closed, an electrical current runs in the liquid through an accumulator (5) or an external power source. At the same time it releases detonating gases that pass through an inertial valve (1) in channel (6) towards a chamber (2) of "Omega". The gases start burning when high voltage is supplied from the accumulator to an electrode (3) through a discharge gap (4) (or any other commutator). The expanding gases pass through a nozzle (11) and make the liquid in the circle accelerate.

At reaching the required centrifugal moment the liquid start flowing into the chamber (2) (while valves (7) are set at maximal centrifugal pressure). Due to the action of a minimal rated charge in the liquid, contradirectional flows pass through the channels of "Omega" and eject from the chamber (2), "flying" one towards another at extremely high speed.

When the liquid (with already weakened molecular bonds) joins in the chamber (8) passing through the jet contactors (9) of a previously charged capacitor (10) there runs a high-voltage discharge (the discharge can also run through a port of a "mixing" electrode (21)).

The instantaneous collision of the liquids, electrical discharging and plasma effects, ultrasonic and cavity processes cause a complete or partial explosion of the liquid (depending on its acceleration and the power of discharging) and its disintegration into hydrogen and oxygen.

Then the liquid oxidizes (burns down). In both cases there is a large amount of energy generated (i.e. practically all the modern technologies are engaged in such a hydrogen release within a microsecond period). To intensify the effect we can fill both chambers (8 and 17) with detonating gas (before an explosion).

While entering into a circle, the torus of liquid accelerates up to ultrasonic speeds and the second ring of "Omega" joins to the operation.

The rotating liquid makes the liquid in the radial peripheral ring rotate as well using a slot (excluding the chamber (17)) or any other way. It results in formation of a jet in the chamber (17) (that operates like a jet pump).

The jet is in spatial motion and passes through the jet contactors (14) (like a part of a conductor). The fuel mixture is supplied to the same chamber through the channel (15). An electric discharge acts up on the jet from the capacitor (that have collected a charge of the current accumulator (16) or any other source) passing through the discharge gap (20) and the jet contactors (14). As a result of it the jet explodes and inflames together with the supplied fuel mixture in the chamber and, passing through the nozzles (18) and (15), imparts energy of the rotation to the torus of liquid. The liquid in the device can be driven either by both rings of "Omega" or by one of them.

Moreover, the external ring of "Omega" can operate as an independent power generator (e.g. as a stream-and-gas mixture generator in combustion chambers of various engines or as a power generator applied to heat turbines instead of a superheated steam generator, etc).

The described device can be applied as a hydrogen and electrical power generator (in this case if the channel (15) is not used or equipped with an extinguishing gate valve). You can find a detailed description of the process in the patented inventions "Method of hydrogen generation" (Rospatent, Abstract #97116916), and "Electrohydrogen Generator (EHG)" (international patent application RU98/00190 dated October 7, 1997, Russian patent #2174162 dated September 27, 2001).

Gravitational Shielding

Harald Chmela, Austria

www.hcrs.at/liquidn2.htm

At the 9th Sept. 1992 in the University of Tampere, Finland an experiment of gravitation shielding by superconductors was set up by Eugene Podkletnov. A superconductor floats over a magnet and is additional taken to a rotation. The gravity over the superconductor was lowered by several percents, depending on the rotation or acceleration of the superconductor.

Since that time I read some reports in the Internet, according to which several people have succeeded in proving this effect with small superconductors, which are available for demonstration in physic.

Most of these setups I hold for insufficient, since both the nitrogen and the superconductor are weighed together and so differences in the evaporation are measured, or others are hanging coil and superconductor into the nitrogen, whereby it comes to lift features by the boiling nitrogen if the coil is warmed up by the current.

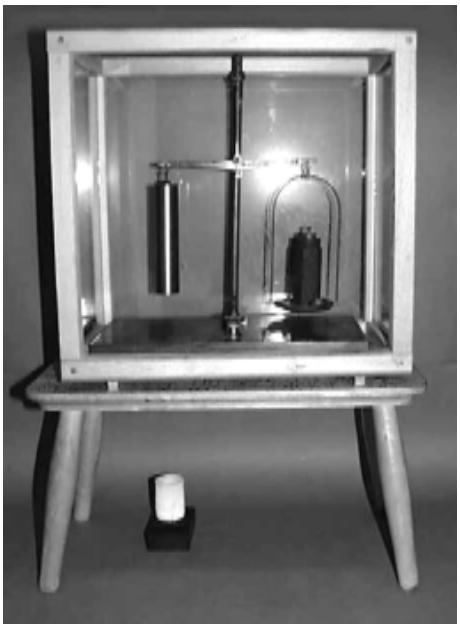

Fig. 1

Experimental setup

For a secured statement I developed this experimental setup. It is essentially a modified tare balance, whose weight on the left side is replaced by a steel cylinder with 2.5 cm diameter. I selected this form, since the change of gravitation is to arise only directly over the superconductor, which diameter is already 2.54 cm. The mass of the cylinder is balanced by various other weights on the right scale pan, so that the bar stands horizontally. Exactly underneath the steel cylinder the superconductor (class 2) and a magnetic disk is placed. The superconductor is brought in the nitrogen over the magnet to float. I tested the sensitivity of the balance. It is sufficient, in order to indicate 0.5 % of weight change. In order to exclude effects by the magnetic attraction, thick steel plates were inserted in the soil of the balance to act as a screen for the magnetic field. It must be considered, that it comes to a field distortion, as the superconductivity is set up and this could cause an excursion also with balanced magnetic field strengths.

Results

The expected results did not take place under all possible test conditions. If the balance is in the equilibrium, and then the nitrogen is poured into the container, there is no excursion to be seen. The superconductivity was examined after each attempt (superconductor is floating over the magnet), and was always present. Also moving or rotating the superconductor could not produce an excursion on the balance.

Of course the superconductor could not be brought into a very fast rotation by hand, as it is perhaps necessary for the effect.

It is in any case not as easy to prove this effect, as some experimenters want makes us to believe. Exaggerated euphoria is not appropriate here.

Experiments With Ball Lightning

Conception of Magnetic Gas

Prepared by our correspondent Alla Pashova

Editor: We publish an interview about fantastical statements made by the inventor Viktor N. Dubchak. It is unlikely that somebody of our readers will seriously take these statements. The methods applied for experimenting seem especially queer. The reason for the publication is direct analogies revealed between the inventor's statements on successful obtaining of non-metal matters with magnetic properties and well-known works by Valerian Sobolev. If Dubchak's experiments on rotation of matter in a magnetic field without supplying outer energy represent the facts, then possibly many of our readers will be interested to reproduce his dangerous experiments with nitric acid and glass wool. Many years have passed since Russian researcher V.N. Dubchak had experimentally discovered the phenomenon of non-metallic magnetics and worked out a magnetic gas (MG) conception. However representatives of the official science have never given attention to the discovery made by the inventor in spite of the fact that results of the researches could be a valuable contribution to the development of high-energy physics.

— In the 60th of the last century reading "Technology to the Youth" magazine I came upon the article "Pulsating ball from the broken plug socket" – Viktor N. Dubchak tells. – The method to generate a ball lightning was described in the article. I believed that it was possible to reproduce the process by myself. After nine months of experimenting I managed to achieve beneficial effects. By dampening a carbolite plug with sulphuric acid I finally obtained not a flame but a reddish ball, which immediately came back into the plug. I tried to tell about my experiments in press but my letters to "Technology to the Youth" were not noticed. The documents which were applied for inventor's certificate were sent back. Nobody showed interest in it.

— In what way the experiments on generation of the ball lightning are related to the magnetic gas conception?

— Thanks to milk-white magnetic gas the lightning becomes ball-shaped. MG serves as cerment to join matters together since at electromagnetic excitation its molecules easily create "dipoles". In a strong electromagnetic field these dipoles are put in order and joined to create one giant molecule.

I dare to suppose what exactly causes ball lightning in natural conditions. At electrical charge oxygen and nitrogen are combined with water. In such a way nitric acid is produced. As a result of combustion the particles of a solid which are wetted in the nitric acid (e.g. wood or minerals) obtain special properties. I have got to know about it in the course of several simple experiments.

I wound cotton and synthetical wool, which was wetted in nitric acid, around a ceramic stick and then place it in the lower part of a torch flame. (It is also possible to use newsprint). The ash, produced as a result of the process, began attracting to the magnet. **The evolved milk-white MG was attracted to the magnet and slowly rotated at its plane.**

Non-metallic magnetics will also become apparent if we burn glass wool wetted with acid and then carry an electrified stick to the obtained brown lump. The lump begins to bounce from the floor.

— What application of the MG conception could be found in power engineering?

— MG can be effectively used for modernization of TOKAMAKs. Along with indifferent gas, which is now used in such set-ups, MG can be injected in the "furnace". It will serve as an astringent and plasma "roll", whose stability is the aim of many researches, will exist much longer.

— Is it possible to generate energy directly from the ball lightning? What is necessary for that?

— Most likely we will need a spherical cavity and indifferent gas, which does not allow the ball lightning to touch the walls of the cavity. However it is not necessary looking for the ways to use the ball lightning since TOKAMAKs have already existed. Much efforts and money have already put into their development.

— Is the MG conception somehow related to the so called "magnetic monofield"?

— No, it does not: "Magnetic monofield" is just a hypothesis, a guess-work by scientists. Actually it does not exist. The incapability to explain natural phenomena causes rising of such nonsense ideas. For example, in an article published by "Lomonosov" magazine the "magnetic monofield" was considered as a cause of the Chernobyl nuclear reactor disaster.

— Have you ever gained the recognition of your achievements?

— I wrote about one of my experiments in Academy of Sciences. They answered: "Do not write any more". Later it was turned out that this seeming indifference was a complete dissimulation. The researches had been already carried out in Russian Academy of Sciences and they did not need a surplus man for that.

— Do you go on your experiments?

— No, at present I just do not have access to necessary documents. Besides, I believe that a beneficial effect has been already achieved by me. Proper application of the present MG conception will allow to improve operating power plants (such as TOKAMAK) within 24 hours. Hence we will not need to increase TOKAMAK dimensions and spend money and materials. Even a small plant will allow producing required amount of the stable plasma.